



FILE
1983
CTC 120 - S1

Color Television Supplement Service Data

CTC 120 Series

RCA Corporation Consumer Electronics

Technical Publications
P.O. Box 1976 | Indianapolis, Indiana 46206

RCA Inc.

Technical Publications
5575 Royalmount Avenue | Town of Mount-Royal | Quebec, Canada H4P 1J8

Canada Stock Numbers:
Add prefix 64 to Module stock numbers.
Add prefix 70 to Tuner stock numbers.
Add prefix 62 to all other stock numbers.

172 Pgs.

SAFETY NOTICE

USE ISOLATION TRANSFORMER WHEN SERVICING

Components having special safety characteristics are identified by shading on schematics and by * stars on the parts list in this Service Data and its supplements and bulletins. Before servicing this chassis, it is important that the service technician read and follow the "Safety Precautions" and "Product Safety Notices" in the Basic Service Data.

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Model-To-Major Assembly Cross Reference

MODEL	CHASSIS	TUNER CONTROL	TUNER VHF/UHF MULTIBAND	PICTURE TUBE	REMOTE
✓ FJR 465W	CTC 120A	MSC011RA	MST007RA	*19VLNP22	
✓ FJR 468WR	CTC 120A	MSC012RA	MST007RA	*19VLNP22	MCR015AREV1/CRK33H
✓ FJR 488SR	CTC 120A	MSC013RA	MST007RA	*19VLNP22	MCR16A/CRK28G
✓ GJR 640P	CTC 120A	VTCA5A	MST008RA	*25VGDP22	
✓ GJR 648P	CTC 120A	VTCA5A	MST008RA	*25VGDP22	
✓ GJR 650T	CTC 120A	MSC006AREVC	MST017RA	*25VGDP22	
✓ GJR 651TR	CTC 120A	MSC012RA	MST007RA	*25VGDP22	MCR017AREV1/CRK33H
✓ GJR 654H	CTC 120A	MSC006AREVC	MST017RA	*25VDGP22	
✓ GJR 654L	CTC 120A	MSC006AREVC	MST017RA	*25VGDP22	
✓ GJR 655HR	CTC 120A	MSC012RA	MST007RA	*25VGDP22	MCR017AREV1/CRK33H
✓ GJR 655LR	CTC 120A	MSC012RA	MST007RA	*25VGDP22	MCR017AREV1/CRK33H
✓ GJR 658P	CTC 120A	MSC006AREVC	MST017RA	*25VGDP22	
✓ GJR 659PR	CTC 120A	MSC012RA	MST007RA	*25VGDP22	MCR017AREV1/CRK33H
✓ GJR 690T	CTC 120A	MSC011RA	MST007RA	*25VGDP22	
✓ GJR 691TR	CTC 120A	MSC013RA	MST007RA	*25VGDP22	MCR16A/CRK28G
✓ GJR 694H	CTC 120A	MSC011RA	MST007RA	*25VGDP22	
✓ GJR 694L	CTC 120A	MSC011RA	MST007RA	*25VGDP22	
✓ GJR 695HR	CTC 120A	MSC013RA	MST007RA	*25VGDP22	MCR16A/CRK28G
✓ GJR 695LR	CTC 120A	MSC013RA	MST007RA	*25VGDP22	MCR16A/CRK28G
✓ GJR 698P	CTC 120A	MSC011RA	MST007RA	*25VGDP22	
✓ GJR 699PR	CTC 120A	MSC013RA	MST007RA	*25VGDP22	MCR16A/CRK28G

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Model-To-Major Assembly Cross Reference

MODEL	CHASSIS	TUNER CONTROL	TUNER VHF/UHF MULTIBAND	PICTURE TUBE	REMOTE
FJR 475W	CTC 120A	MSC011A	MST007RA	★19VLNP22	
FJR 476W	CTC 120A	MSC011A	MST007RA	★19VLNP22	
FJR 477F	CTC 120A	MSC011A	MST007RA	★19VLNP22	
FJR 478WR	CTC 120A	MSC012RA	MST007RA	★19VLNP22	MCR016RA/CRK28G
FJR 479WR	CTC 120A	MSC013RA	MST007RA	★19VLNP22	MCR016RA/CRK28G
FJR 480FR	CTC 120A	MSC013RA	MST007RA	★19VLNP22	MCR016RA/CRK28G
GJR 636P	CTC 120A	VTCA5A	MST008A	★25VGDP22	
GJR 638P	CTC 120A	VTCA5A	MST008A	★25VDGP22	
GJR 657PR	CTC 120A	MSC012RA	MST007RA	★25VGDP22	MCR017AREV1/CRK33H
GJR 660T	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJR 661TR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR016RA/CRK28G
GJR 668P	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJR 669PR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR016RA/CRK28G
GJR 670T	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJR 672TR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR016RA/CRK28G
GJR 673T	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJR 674TR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR016RA/CRK28G
GJR 676P	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJR 677PR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR016RA/CRK28G
GJR 678P	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJR 679PR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR016RA/CRK28G

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CTC 120 (1983)
CTC 120A

SAFETY NOTICE USE ISOLATION TRANSFORMER WHEN SERVICING

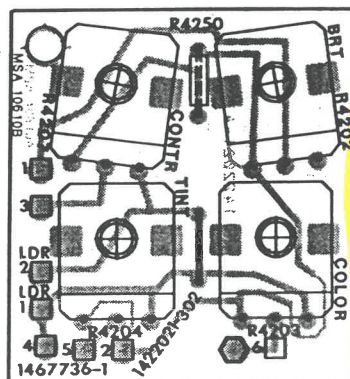
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Model-To-Major Assembly Cross Reference

MODEL	CHASSIS	TUNER CONTROL	TUNER VHF/UHF MULTIBAND	PICTURE TUBE	REMOTE
GJC 650T	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJC 654H	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJC 654L	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJC 658P	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJR 639PR	CTC 120A	MSC012RA	MST007RA	★25VGDP22	MCR016RA/CRK28G
GJR 751TR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR017AREV.1/CRK33H
GJR 756HR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR017AREV.1/CRK33H
GJR 759PR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR017AREV.1/CRK33H

Also
JJR 950 W
JJR 950 Y
JJR 955 W
JJR 955 Y
JJR 950 E
JJR 955 M
JJR 960 WR
JJR 960 TR





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Addendum 1

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GJC 654H	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJC 654L	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJC 658P	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJR 639PR	CTC 120A	MSC012RA	MST007RA	★25VGDP22	MCR017AREV.1/CRK33H
GJR 641PR	CTC 120A	MSC012RA	MST007RA	★25VGDP22	MCR017AREV.1/CRK33H
GJR 649PR	CTC 120A	MSC012RA	MST007RA	★25VGDP22	MCR017AREV.1/CRK33H
GJR 683T	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJR 684TR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR016RA/CRK28G
GJR 750T	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJR 751TR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR016RA/CRK28G
GJR 755H	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJR 756HR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR016RA/CRK28G
GJR 758P	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJR 759PR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR016RA/CRK28G

1983 CTC 120 — S6 Addendum 1

Also: GJR 652P
GJR 653PR
FJR 528P

JJR 988 BR
JJR 962 WR

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✓ GJR 690T	CTC 120A	MSC011RA	MST007RA	★25VGDP22	
✓ GJR 691TR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR16A/CRK28G
✓ GJR 694H	CTC 120A	MSC011RA	MST007RA	★25VGDP22	
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✓ GJR 695HR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR16A/CRK28G
✓ GJR 695LR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR16A/CRK28G
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See Basic Service Data for additional disassembly instructions.

Auxiliary Control Assembly Removal

Remove one $\frac{1}{4}$ " hex head screw (all models except VTCA versions) or two $\frac{1}{4}$ " hex head screws (VTCA versions only). Remove On/Off knob (VTCA models only). Pull assembly straight back and out of instrument (remove P701 from chassis).

Note: LDR leads are attached to PW 4200 board.

Tuner Control Assembly VTCA5A Removal

Open Auxiliary Control door.
Remove channel selector knob.
Disconnect P302 from chassis.
Remove four (4) $\frac{1}{4}$ " hex head screws.
Pull assembly straight back and out of instrument.

MST008RA Tuner Removal

Remove two $\frac{1}{4}$ hex head screws (one on rear and one on front of mounting bracket. Disconnect P4002 from VTCA and withdraw tuner from cabinet.

Frequency Synthesis Tuner and Control Assembly Removal

Remove interconnect plug and cable assemblies.

P2MSC from J2MSC (on MSC module).
P1BCD (manual version) from Channel Switch Assembly.
P2BCD (remote version) from Channel Switch Assembly.
P1MCR (remote version) from MCR module.
P1MPS (remote version) from keyboard assembly.
P1SYS (remote version) from keyboard assembly.
P1LED from LED Channel Display Assembly.
P2LED from LED Channel Display Assembly.
P3MSC From MSC assembly
I-F Cable Assembly from J24001 (on MST Tuner Module).
P1101 From MCR016A
Remove VHF antenna (leads or cable) from antenna block.
Remove UHF antenna leads from UHF terminals.
Remove one (1) $\frac{1}{4}$ " hex head screw at rear of tuning assembly and remove one (1) $\frac{1}{4}$ " hex head screw at front of assembly (below P2MSC connector). Pull assembly back slightly and lift out of instrument.

Keyboard Assembly Removal

Remove the manual keyboard (manual versions) and remote tuning switch keyboard (remote versions) by first removing four (4) $\frac{1}{4}$ " screws. Disconnect PIBCD connector (manual version) or P1MPS connector and P2MCR (remote version). The assembly can then be removed from rear of the cabinet front.

LED Display Removal

Using needle nose pliers grasp spring mounting clip by leaf tab and pull spring clip off plastic mounting stud. Removal of one spring clip is sufficient. An alternate method is to use a thin pointed object and slip under the edge of the spring clip and pry loose from plastic mounting stud. Disconnect P1LED and P2LED connectors from LED Board.

Note: Care is required in removal of the spring clip so as to not break off plastic mounting stud.

On-Off Volume Assembly Removal (Manual Keyboard Versions)

Remove knob from front of set. Remove two (2) $\frac{1}{4}$ " hex head screws from assembly and remove assembly. Remove P101 and P202 from chassis.

MCR 015/017 Removal

Push spring clips (detented in notches on sides of MCR circuit board and withdraw board to the rear. Disconnect P106 (from J106 on chassis, P3MCR (from keyboard) and P1MCR (from MSC module).

MCR016 Removal

Remove one screw at front of assembly. Slide assembly forward and lift up.

LDR Assembly Removal

This assembly is held in place by one (1) $\frac{1}{4}$ " screw. The screw and assembly must be removed from the rear.

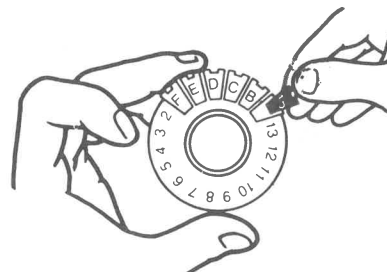


Fig. 1 — VCTA Models Insert Replacement

UHF Channel Indicator Insert Replacement (VTCA5)

To remove lettered inserts, remove channel selector knob by gripping it between your thumb and forefinger and pull it toward you. Push outer edge of the channel tab towards the center of the dial to release from locked notch on the dial. Hold the numbered tab by the notched side (Fig. 1) Place the small end of insert into the grooves at each side of window opening and slide toward the knob (Fig. 1) until the notch end of insert locks into the outer rim of the dial.

VHF/UHF CHANNEL ADJUSTMENTS (VTCA Models Only)

VHF Channel Tuning

Turn TV "On", select an active channel in your area and allow set to warm up a few minutes.

Place AFT switch in "off" position.

Turn the VHF Fine Tuning Screw to obtain best picture and sound. Repeat adjustment for all local VHF channels. Place AFT switch in "on" position.

UHF Channel Tuning

Six channel positions are available for selecting any of the possible 70 UHF channels. These positions are designated as channel A thru F. Rotate the channel selector to one of these positions (example Channel A). Place the AFT switch in "off" position. There is a scale calibrated from channel 14 thru channel 83. This is to be used as a tuning aid.

Follow tuning procedure outlined for VHF tuning, rotating the thumb wheel to the left to tune lower channel and to the right to tune higher channels. Repeat the adjustment for all local UHF channels. Place AFT switch in "on" position.

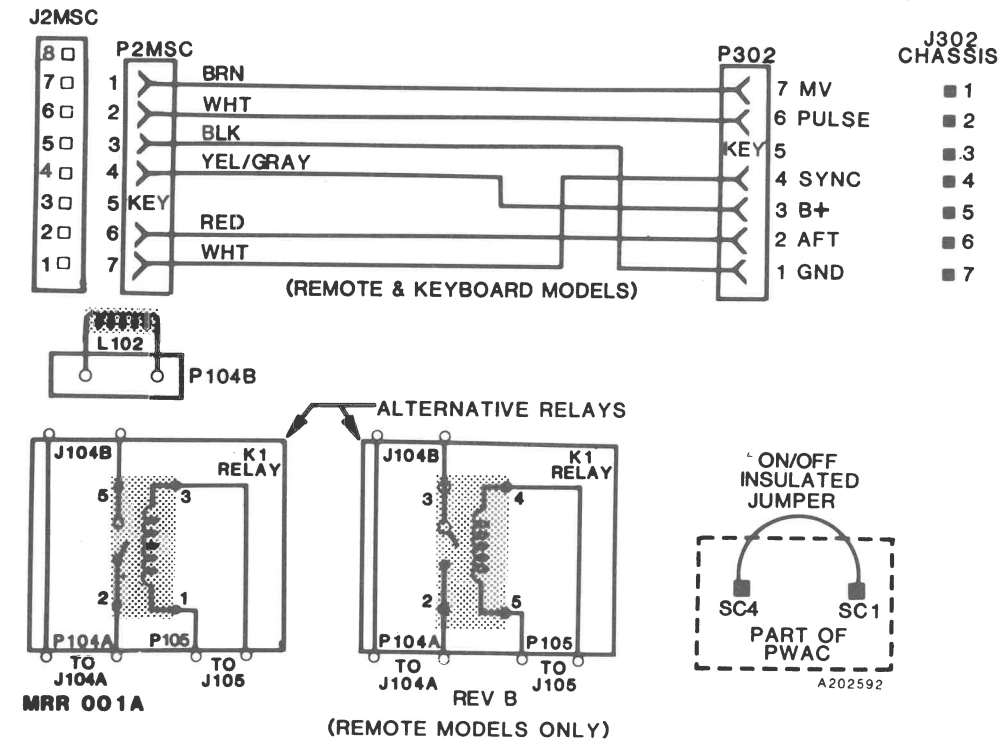
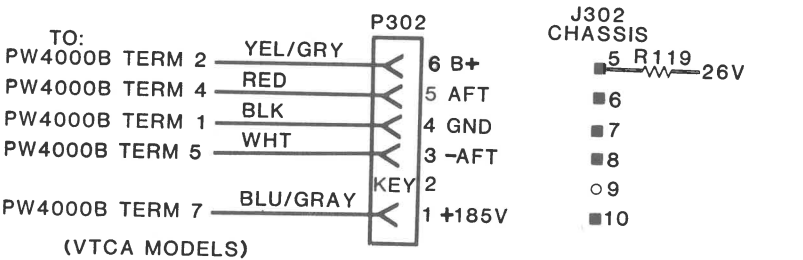


Fig. 2 — Interconnect Diagram

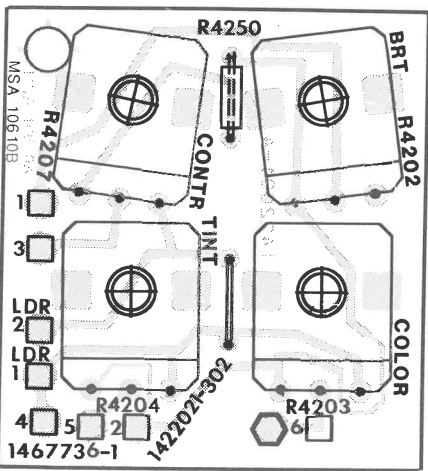


Fig. 3 — Auxiliary Control Circuit Board — All Models Except VTCA Models

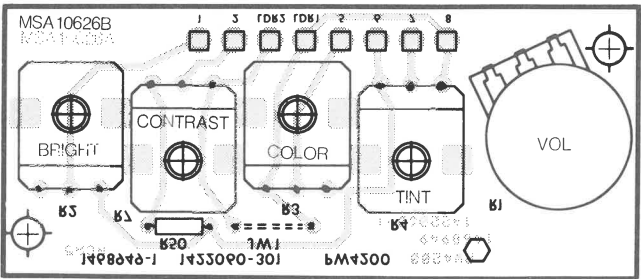


Fig. 4 — Auxiliary Control Circuit Board — VTCA Models Only

REPLACEMENT PARTS

BEFORE REPLACING PARTS, READ THE FOLLOWING:

RCA-Approved Substitute Stock Numbers—Before ordering stock numbers in this parts list, look for an RCA-approved substitute stock number in the current *RCA Distributor & Special Products Price Schedule*. This will minimize your service time and avoid ordering parts you already have in stock.

See your RCA Distributor for Replacement Parts and Accessories.

Warranty Status of Assemblies and Parts—The warranty status of some assemblies and parts are indicated by one of the following Warranty Status Codes:

- Complete assembly not eligible for warranty exchange or replacement.
- † Eligible for warranty exchange for new or rebuilt unit.
- ‡ Complete assembly eligible for warranty replacement with new or rebuilt unit.

All parts listed without a Warranty Status Code symbol are eligible for warranty replacement as discrete components.

Warranty replacement of cabinet parts requires prior approval of RCA.

Warranty Status and Specifications of assemblies and parts are subject to change without notice.

PRODUCT SAFETY NOTE—Components marked with a (★) have special characteristics important to safety. Before replacing any of these components, read carefully the **PRODUCT SAFETY NOTICE** in the Basic Service Data. Do not degrade the safety of the set through improper servicing. Although assemblies as a whole may not be marked with a (★), replacement of RCA assemblies with other assemblies not RCA approved may result in a safety hazard.

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.....AVOID REPLACEMENT PART ERRORS.....

File supplements and addendums immediately upon receipt, and consult the parts lists in them before ordering parts.

NOTE: For complete coverage of all parts and assemblies used in instruments equipped with the chassis series to which this service data relates, consult the following publications:

● **Basic Service Data**—Chassis and tuning systems and most related parts and assemblies that do not differ from one model or model group to another.

● **Service Data Supplements**—Cabinet, auxiliary, and other parts and assemblies that differ from one model group to another.

● **Service Data Addendum**—Any parts additions, deletions, or other changes made after initial production.

Do not replace or order parts without first consulting any Addendum(s) that may have been issued since publication of this service data.

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
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INSTRUMENT ASSEMBLIES

			FJR465W
			FJR468WR
			FJR488SR
C424	156249	2843149-502	CAP WIDTH ASSEMBLY
F101	152209	2841951-003	★ FUSE 5 AMP 125V
J1MCR	118750	1461635-013	CONNECTOR
K1	147696	1458751-502	RELAY
L101	154301	1496553-504	★ COIL
L102	148491	1463890-507	★ COIL DEGAUSSING
P1SVS	157824	2860742-005	CONNECTOR
P101	118750	1461635-013	CONNECTOR
P104	158677	2861681-008	★ CONNECTOR DEGAUSSING
P2MSC	158237	2861607-305	CONNECTOR
P201	157814	2861602-300	CONNECTOR
P202	157354	2861604-303	CONNECTOR
P3MSC	157354	2861604-303	CONNECTOR
P302	158237	2861607-305	CONNECTOR
P401	153788	2831216-001	CONNECTOR QUAD YOKE
P501	158678	2861681-001	★ CONNECTOR DUAL YOKE
P701	158238	2861607-306	CONNECTOR
P703	157612	2861659-001	CONNECTOR
P1103	158679	2861623-208	CONNECTOR
R118	147872	945313-160	RES REMOTE POWER
R4201	145723	1472207-102	★ RES CONTROL VOLUME W/ SWITCH
R4202	147612	1473369-002	★ RES CONTROL BRIGHTNESS/ BLACK LEVEL
R4203	147613	1473369-004	★ RES CONTROL COLOR
R4204	147613	1473369-004	★ RES CONTROL TINT
R4207	149925	1473369-005	★ RES CONTROL CONTRAST/ PICTURE
S8B	153429	2841813-507	SWITCH TUNING FJR468WR
S8B	150486	2841813-504	SWITCH TUNING FJR488SR
S10B	150351	2841866-503	SWITCH TUNING
S4201			★ SWITCH ON/OFF PART OF R4201
V101		2814626-001	★ PICTURE TUBE 19VLNP22

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
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10E0113	1472698-003	ANTENNA, UHF
156265	1467201-003	ANTENNA, VHF
157407	1439970-006	★ BACK, CABINET FJR465W, FJR468WR
157219	2831328-001	★ BACK, CABINET FJR488SR
	2817331-001	BOOK, INSTRUCTION FJR465W
	2817332-001	BOOK, INSTRUCTION FJR468WR
	2817316-001	BOOK, INSTRUCTION FJR488SR
153435	1467652-001	BRACKET, CHASSIS MTG FJR488SR
154300	2840554-506	★ CABLE, AC POWER
150471	1458752-502	CIRCUIT, AUX CONTROL FJR465W, FJR468WR
156431	2843374-501	CIRCUIT AUX CONTROL FJR488SR
143659	1491017-001	CLAMP, BEAM BENDER
149902	1491071-002	CLAMP, YOKE
141701	1448623-003	CLIP, MCY MTG
147821	2870635-001	CLIP, REMOTE RECEIVER MTG
151991	2841270-001	CUSHION, DOOR
149903	2870908-001	CUSHION, WEDGE YOKE ADJ
150485	1467668-012	DOOR, AUX CONTROL FJR465W
151416	1467668-014	DOOR, AUX CONTROL FJR468WR
157220	2831500-001	DOOR, AUX CONTROL FJR488SR
138785	1447321-006	GROMMET, FOR KINE SHIELD
150190	1468938-001	HINGE, DOOR
147685	1466408-002	INDICATOR, READ OUT
150352	1468145-501	★ KNOB, ON/VOL
145381	1463762-502	MAGNET, BEAM BENDER
158097	1439969-012	★ MASK, CABINET FRONT FJR465W
158092	1439969-031	★ MASK, CABINET FRONT FJR468WR
157218	2831338-001	★ MASK, CABINET FRONT FJR488SR
114918	990327-128	NUT, CONTROL MTG
124338	1403390-405	NUT, SPEAKER MTG
157221	2861123-001	OVERLAY, DOOR FJR488SR
157222	2861124-001	OVERLAY, SPEAKER FJR488SR
151414	2841836-505	RES LIGHT DETECTING
139301	1479290-001	RETAINER, BEAD CHAIN
117360	1442576-006	RETAINER, INDICATOR
154435	1479290-011	RETAINER, WIRE TIE
149552	2871314-002	★ SCREW, KINE MTG
150474	2841923-501	★ SHIELD, KINE HOOD
156280	1468975-005	SPEAKER, 3 X 5 INCH 32 OHM
151670	2871319-001	SPRING, DOOR LATCH
153971	2870572-002	TERMINAL, DUAL YOKE
123895	1442877-101	TERMINAL, FEMALE
153789	2860025-001	TERMINAL, QUAD YOKE
158080	1468158-004	WINDOW, IR FJR468WR
157223	2831504-001	WINDOW, IR FJR488SR
153940	1468157-003	WINDOW, TUNING FJR465W
153294	2842008-503	★ YOKE

Continued on next page

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REPLACEMENT PARTS

Replacement Parts Continued (See Product Safety Note on first page of this parts list)

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION	SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
C3	143884	1491409-30R	CAPCD .01UF Z Z5V 50V		150471	1458752-502	CIRCUIT, AUX CONTROL
C4	143967	1491408-82M	CAPCD 4700PF K Z5P 50V		156404	2844167-501	CIRCUIT, CHANNEL DISPLAY
C424	156249	2843149-502	CAP WIDTH ASSEMBLY		143659	1491017-001	CLAMP, BEAM BENDER/YOKE
					158671	2844180-001	CLIP, INDICATOR MTG
CR1	119597	1471872-006	DIODE		141701	1448623-003	CLIP, MCY MTG
CR2	119597	1471872-006	DIODE		147821	2870635-001	CLIP, REMOTE RECEIVER MTG
					151870	1467638-016	DOOR, AUX CONTROL GJR651TR
F101	152209	2841951-003	* FUSE 5 AMP 125V		154429	1467638-021	DOOR, AUX CONTROL GJR655HR
					151913	1467638-014	DOOR, AUX CONTROL GJR655LR
FB1	152103	2843117-002	BEAD		157894	1467638-022	DOOR, AUX CONTROL GJR659PR
FB2	152103	2843117-002	BEAD		153887	2860092-001	DOOR, AUX CONTROL GJR691TR
FB3	152102	2843117-001	BEAD		157618	2860092-006	DOOR, AUX CONTROL GJR695HR
					153890	2860092-002	DOOR, AUX CONTROL GJR695LR
J1MCR	118750	1461635-013	CONNECTOR		157622	2860092-007	DOOR, AUX CONTROL GJR699PR
					153781	1467748-005	FRAME, CHASSIS MTG
K1	147696	1458751-502	RELAY		134554	1442093-003	GLIDE
					138785	1447321-006	GROMMET, FOR KINE SHIELD
L101	154301	1496553-504	* COIL		143459	1496207-001	GROMMET, MST MTG
L102	148493	1463890-509	* COIL DEGAUSSING		147685	1466408-002	INDICATOR, READ OUT
					153782	2860711-001	INSULATOR, SERVICE CONTROLS
P1SVS	157824	2860742-005	CONNECTOR		153895		KNOB, DECORATIVE GJR695HR,LR
P104	158677	2861681-008	* CONNECTOR DEGAUSSING		143023		KNOB, DECORATIVE GJR699PR
P2MSC	158237	2861607-305	CONNECTOR		145381	1463762-502	MAGNET, BEAM BENDER
P201	157814	2861602-300	CONNECTOR		157499	1438352-059	* MASK, BASIC GJR651TR
P302	158237	2861607-305	CONNECTOR		157501	1438352-060	* MASK, BASIC GJR655HR
P401	153788	2831216-001	* CONNECTOR QUAD YOKE		157503	1438352-061	* MASK, BASIC GJR655LR
P501	158678	2861681-001	* CONNECTOR DUAL YOKE		157895	1438352-099	* MASK, BASIC GJR659PR
P701	158238	2861607-306	CONNECTOR		157614	1438352-080	* MASK, BASIC GJR691TR
P703	157612	2861659-001	CONNECTOR		157617	1438352-081	* MASK, BASIC GJR695HR
P1103	158679	2861623-208	CONNECTOR		157620	1438352-082	* MASK, BASIC GJR695LR
					157621	1438352-075	* MASK, BASIC GJR699PR
Q1	143806	1417347-004	TRANSISTOR		124338	1403390-405	NUT, SPEAKER MTG
					148028	2870627-001	OVERLAY, CHAN/VOL
R118	147872	945313-160	RES REMOTE POWER		142415		PULL, DECORATIVE GJR655HR,LR
R4202	147612	1473369-002	* RES CONTROL BRIGHTNESS		153804		PULL, DECORATIVE GJR659PR
R4203	147613	1473369-004	* RES CONTROL COLOR		157619		PULL, DECORATIVE GJR695HR,LR
R4204	147613	1473369-004	* RES CONTROL TINT		153896		PULL, DECORATIVE GJR699PR
R4207	149925	1473369-005	* RES CONTROL CONTRAST		151414	2841836-505	RES LIGHT DETECTING
SPGM	153837	2842234-504	SWITCH PROGRAM		139301	1420183-004	RETAINER, BEAD CHAIN
S4B	151425	2842237-504	SWITCH CHAN/VOL		154435	1479290-011	RETAINER, WIRE TIE
S8B	153892	2841813-505	SWITCH TUNING		149552	2871314-001	* SCREW, KINE MTG
					151424	2841874-501	SHIELD, KINE HOOD
V101		2814627-002	* PICTURE TUBE 25VGDP22		148073	1467914-001	SOCKET, CASTER
					142947	1468977-005	SPEAKER, 4 X 6 INCH 32 OHM
					145134	1491493-002	SPRING, MCY RETAINER
					141648	1449759-003	STOP, DOOR
	157498	2831304-027	* BACK, COVER GJR691TR		158228	2861642-001	SWIVEL
	157490	2831304-028	* BACK, COVER GJR655HR, LR, GJR659PR,		153791	2870572-002	TERMINAL, DUAL YOKE
			GJR695HR, LR, GJR699PR		143789	2860025-001	TERMINAL, QUAD YOKE
	157892	2831304-037	* BACK, COVER GJR651TR		157615	2871524-001	TRIM, BOTTOM GJR691TR
		2817304-002	BOOK, INSTRUCTION GJR651TR		157616	2871524-002	TRIM, TOP GJR691TR
			GJR655HR, GJR655LR, GJR659PR		153893	2871987-001	WINDOW, IR GJR691TR,
		2817322-001	BOOK, INSTRUCTION GJR691TR				GJR695HR, LR
			GJR695HR, GJR695LR, GJR699PR		157500	1468918-007	WINDOW, READOUT GJR651TR,
	154300	2840554-506	* CABLE, AC POWER				GJR655HR,
	156270	1439369-007	CAP, KINE COVER				GJR655HR, GJR659PR
	128573	1446199-001	CASTER		153243	1463773-506	* YOKE



FILE
1983
CTC 120

Color Television Basic Service Data

CTC 120 Series

RCA Corporation Consumer Electronics

Technical Publications
P.O. Box 1976 | Indianapolis, Indiana 46206

RCA Inc.

Technical Publications
5575 Royalmount Avenue | Town of Mount-Royal | Quebec, Canada H4P 1J8

Canada Stock Numbers:
Add prefix 64 to Module stock numbers.
Add prefix 70 to Tuner stock numbers.
Add prefix 62 to all other stock numbers.

TO AVOID ERROR file all supplements and addendums as soon as received. Consult these before ordering parts.

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Service Data Reference

MST 007/013 Multiband Tuner Alignment (MTA-1)

SAFETY NOTICE

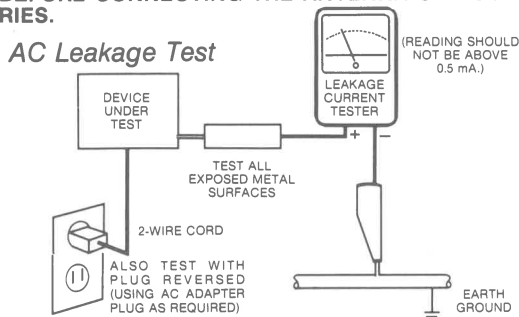
USE ISOLATION TRANSFORMER WHEN SERVICING

Components having special safety characteristics are identified by shading on schematics and by * stars on the parts list in this Service Data and its supplements and bulletins. Before servicing this chassis, it is important that the service technician read and follow the "Safety Precautions" and "Product Safety Notices" in this Service Data.

* For continued x-radiation protection, replace picture tube with original type or RCA-approved equivalent type. If field replacement of picture tube is required, an ADJUSTABLE TYPE BEAM BENDER must be ordered and installed on the neck of the replacement picture tube. Consult parts list for correct stock number.

SAFETY PRECAUTIONS

1. **Before returning an instrument to the customer**, always make a safety check of the entire instrument, including, but not limited to, the following items:
 - a. Be sure that no built-in protective devices are defective and/or have been defeated during servicing. (1) Protective shields are provided on this chassis to protect both the technician and the customer. Correctly replace all missing protective shields, including any removed for servicing convenience. (2) When reinstalling the chassis and/or other assembly in the cabinet, be sure to put back in place all protective devices, including, but not limited to, nonmetallic control knobs, insulating fishpapers, adjustment and compartment covers/shields, and isolation resistor/capacitor networks. **Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning. Servicers who defeat safety features or fail to perform safety checks may be liable for any resulting damage.**
 - b. Be sure that there are no cabinet openings through which an adult or child might be able to insert their fingers and contact a hazardous voltage. Such openings include, but are not limited to, (1) spacing between the picture tube and the cabinet mask, (2) excessively wide cabinet ventilation slots, and (3) an improperly fitted and/or incorrectly secured cabinet back cover.
 - c. **Antenna Cold Check** — With the instrument AC plug removed from any AC source, connect an electrical jumper across the two AC plug prongs. Place the instrument AC switch in the on position. Connect one lead of an ohmmeter to the AC plug prongs tied together and touch the other ohmmeter lead in turn to each tuner antenna input exposed terminal screw and, if applicable, to the coaxial connector. If the measured resistance is less than 1.0 megohm or greater than 5.2 megohm, an abnormality exists that must be corrected before the instrument is returned to the customer. Repeat this test with the instrument AC switch in the off position.
 - d. **Leakage Current Hot Check** — With the instrument completely reassembled, plug the AC line cord directly into a 120V AC outlet. (Do not use an isolation transformer during this test.) Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI) C101.0 *Leakage Current for Appliances* and Underwriters Laboratories (UL) 1410, (50.7). With the instrument AC switch first in the on position and then in the off position, measure from a known earth ground (metal waterpipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle bracket, metal cabinet, screwheads, metallic overlays, control shafts, etc.), especially any exposed metal parts that offer an electrical return path to the chassis. Any current measured must not exceed 0.5 milliamp. Reverse the instrument power cord plug in the outlet and repeat test.
ANY MEASUREMENTS NOT WITHIN THE LIMITS SPECIFIED HEREIN INDICATE A POTENTIAL SHOCK HAZARD THAT MUST BE ELIMINATED BEFORE RETURNING THE INSTRUMENT TO THE CUSTOMER OR BEFORE CONNECTING THE ANTENNA OR ACCESSORIES.



- e. **X-Radiation and High Voltage Limits** — Because the picture tube is the primary potential source of X-radiation in solid-state TV receivers, it is specially constructed to prohibit X-radiation emissions. For continued X-radiation protection, the replacement picture tube must be the same type as the original. Also, because the picture tube shields and mounting hardware perform an X-radiation protection function, they must be correctly in place. High voltage must be measured each time servicing is performed that involves B+, horizontal deflection or high voltage. Correct operation of the X-radiation protection circuits also must be reconfirmed each time they are serviced. (X-radiation protection circuits also may be called "horizontal disable" or "hold-down.") Read and apply the high voltage limits and, if the chassis is so equipped, the X-radiation protection circuit specifications given on

instrument labels and in the *Product Safety & X-radiation Warning* note on the service data chassis schematic.

- High voltage is maintained within specified limits by close-tolerance safety-related components/adjustments in the high-voltage circuit. If high voltage exceeds specified limits, check each component specified on the chassis schematic and take corrective action.
2. Read and comply with all caution and safety-related notes on or inside the receiver cabinet, on the receiver chassis, or on the picture tube.
 3. **Design Alteration Warning** — Do *not* alter or add to the mechanical or electrical design of this TV receiver. Design alterations and additions, including, but not limited to, circuit modifications and the addition of items such as auxiliary audio and/or video output connections, might alter the safety characteristics of this receiver and create a hazard to the user. Any design alterations or additions may void the manufacturer's warranty and may make you, the servicer responsible for personal injury or property damage resulting therefrom.
 4. **Picture Tube Implosion Protection Warning** — The picture tube in this receiver employs integral implosion protection. For continued implosion protection, replace the picture tube only with one of the same type number. Do *not* remove, install, or otherwise handle the picture tube in any manner without first putting on shatterproof goggles equipped with side shields. People not so equipped must be kept safely away while picture tubes are handled. Keep the picture tube away from your body. Do not handle the picture tube by its neck. Some "in-line" picture tubes are equipped with a permanently attached deflection yoke; because of potential hazard, do *not* try to remove such "permanently attached" yokes from the picture tube.
 5. **Hot Chassis Warning** — a. Some TV receiver chassis are electrically connected directly to one conductor of the AC power cord and may be safely serviced without an isolation transformer only if the AC power plug is inserted so that the chassis is connected to the *ground* side of the AC power source. To confirm that the AC power plug is inserted correctly, with an AC voltmeter measure between the chassis and a known earth ground. If a voltage reading in excess of 1.0V is obtained, remove and reinsert the AC power plug in the opposite polarity and again measure the voltage potential between the chassis and a known earth ground. b. Some TV receiver chassis normally have 85V AC (RMS) between chassis and earth ground regardless of the AC plug polarity. These chassis can be safely serviced only with an isolation transformer inserted in the power line between the receiver and the AC power source, for both personnel and test equipment protection. c. Some TV receiver chassis have a secondary ground system in addition to the main chassis ground. This secondary ground system is *not isolated* from the AC power line. The two ground systems are electrically separated by insulating material that must not be defeated or altered.
 6. Observe original lead dress. Take extra care to assure correct lead dress in the following areas: a. near sharp edges, b. near thermally hot parts — be sure that leads and components do not touch thermally hot parts, c. the AC supply, d. high voltage, and e. antenna wiring. Always inspect in all areas for pinched, out-of-place, or frayed wiring. Do not change spacing between components, and between components and the printed-circuit board. Check AC power cord for damage.
 7. Components, parts, and/or wiring that appear to have overheated or are otherwise damaged should be replaced with components, parts, or wiring that meet original specifications. Additionally, determine the cause of overheating and/or damage and, if necessary, take corrective action to remove any potential safety hazard.
 8. **PRODUCT SAFETY NOTICE** — Many TV electrical and mechanical parts have special safety-related characteristics some of which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified in RCA service data by *shading* on schematics and by a (*) in the parts list. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part in RCA service data parts list might create shock, fire, and/or other hazards. Product Safety is under review continuously and new instructions are issued whenever appropriate. For the latest information, always consult the appropriate current RCA service literature. A subscription to, or additional copies of, RCA service literature may be obtained at a nominal charge from your RCA Consumer Electronics Distributor or from RCA Technical Publications, P.O. Box 1976, Indianapolis, IN 46206, or Canadian residents may order from RCA Inc., Technical Publications, 5575 Royalmount Ave., Town of Mount-Royal, Quebec H4P 1J8 Canada.

CAUTION: Before servicing instruments covered by this service data and its supplements and addendums, read and follow the **SAFETY PRECAUTIONS** on page 2 of this publication. **NOTE:** If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 2 of this publication, always follow the safety precautions. **Remember: Safety First.**

General Servicing Precautions

1. Always unplug the instrument AC power cord from the AC power source before:
 - a. Removing or reinstalling any component, circuit board, module, or any other instrument assembly.
 - b. Disconnecting or reconnecting any instrument electrical plug or other electrical connection.
 - c. Connecting a test substitute in parallel with an electrolytic capacitor in the instrument.

Caution: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

- d. Discharging the picture tube anode.
2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc.) equipped with a suitable high voltage probe. *Do not test high voltage by "drawing an arc".*
3. Discharge the picture tube anode only by (a) first connecting one end of an insulated clip lead to the degaussing or kine aquadag grounding system shield at the point where the picture tube socket ground lead is connected, and then (b) touch the other end of the insulated clip lead to the picture tube anode button, using an insulating handle to avoid personal contact with high voltage.
4. Do *not* spray chemical on or near this instrument or any of its assemblies.
5. Unless specified otherwise in this service data, clean electrical contacts by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable nonabrasive applicator: 10% (by volume) Acetone and 90% (by volume) isopropyl alcohol (90% - 99% strength). **Caution:** *This is a flammable mixture.*

Unless specified otherwise in this service data, lubrication of contacts is not required.

6. Do *not* defeat any plug/socket B+ voltage interlocks with which instruments covered by this service data might be equipped.
7. Do *not* apply AC power to this instrument and/or any of its electrical assemblies unless *all* solid-state device heat sinks are correctly installed.
8. Always connect the test instrument ground lead to the appropriate instrument chassis ground *before* connecting the test instrument positive lead. Always remove the test instrument ground lead *last*.
9. Use with this instrument only the test fixtures specified in this service data. **CAUTION:** Do *not* connect the test fixture ground strap to any heatsink in this instrument.

Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called *Electrostatically Sensitive (ES) Devices*. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques

should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a *grounded-tip* soldering iron to solder or unsolder ES devices.
4. Use only an *anti-static* type solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do *not* use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do *not* remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material.)
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed. **CAUTION:** Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

General Soldering Guidelines

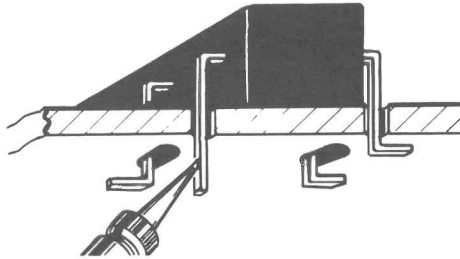
1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range 500°F to 600°F.
2. Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.
3. Keep the soldering iron tip clean and well tinned.
4. Thoroughly clean the surfaces to be soldered. Use a small wire-bristle (0.5 inch, or 1.25 cm) brush with a metal handle. Do not use freon-propelled spray-on cleaners.
5. Use the following unsoldering technique:
 - a. Allow the soldering iron tip to reach normal temperature (500°F to 600°F).
 - b. Heat the component lead until the solder melts.
 - c. Quickly draw away the melted solder with an anti-static, suction-type solder removal device or with solder braid.

CAUTION: Work quickly to avoid overheating the circuit board printed foil.
6. Use the following soldering technique:
 - a. Allow the soldering iron tip to reach normal temperature (500°F to 600°F).
 - b. First, hold the soldering iron tip and solder strand against the component lead until the solder melts.

- c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.

CAUTION: Work quickly to avoid overheating the circuit board printed foil or components.

- d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.



Use Soldering Iron To Pry Leads

IC Removal/Replacement

Some RCA unitized chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are the slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined in paragraphs 5 and 6 above.

Removal

1. Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.
2. Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

Replacement

1. Carefully insert the replacement IC in the circuit board.
2. Carefully bend each IC lead against the circuit foil pad and solder it.
3. Clean the soldered areas with a small wire-bristle brush. (It is not necessary to reapply acrylic coating to the areas.)

"Small-Signal" Discrete Transistor Removal/Replacement

1. Remove the defective transistor by clipping its leads as close as possible to the component body.
2. Bend into a "U" shape the end of each of three leads remaining on the circuit board.
3. Bend into a "U" shape the replacement transistor leads.
4. Connect the replacement transistor leads to the corresponding leads extending from the circuit board and crimp the "U" with long nose pliers to insure metal to metal contact, then solder each connection.

Power Output Transistor Devices Removal/Replacement

1. Heat and remove all solder from around the transistor leads.
2. Remove the heatsink mounting screw (if so equipped).
3. Carefully remove the transistor from the circuit board.
4. Insert new transistor in circuit board.
5. Solder each transistor lead, and clip off excess lead.
6. Replace heatsink.

Diode Removal/Replacement

1. Remove defective diode by clipping its leads as close as possible to diode body.

2. Bend the two remaining leads perpendicularly to the circuit board.
3. Observing diode polarity, wrap each lead out of the new diode around the corresponding lead on the circuit board.
4. Securely crimp each connection and solder it.
5. Inspect (on the circuit board copper side) the solder joints of the two "original" leads. If they are not shiny, reheat them and, if necessary, apply additional solder.

Fuse and Conventional Resistor Removal/Replacement

1. Clip each fuse or resistor lead at top of circuit board hollow stake.
2. Securely crimp leads of replacement component around stake 1/8 inch from top.
3. Solder the connections.

CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board, to prevent excessive component temperatures.

Circuit Board Foil Repair

Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds the foil to the circuit board, causing the foil to separate from, or "lift-off", the board. The following guidelines and procedures should be followed whenever this condition is encountered.

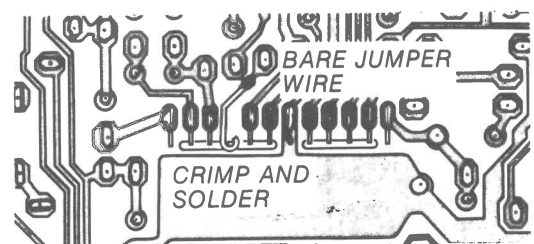
In Critical Copper Pattern Areas

High component/copper pattern density and/or special voltage/current characteristics make the spacing and integrity of copper pattern in some circuit board areas more critical than in others. The circuit foil in these areas is designated as *Critical Copper Pattern* and is identified and illustrated in this service data in the section titled *Safety Related Copper Pattern* (see table of contents for page number). Because Critical Copper Pattern requires special soldering techniques to ensure the maintenance of reliability and safety standards, contact your local RCA Consumer Electronics Distributor Service Manager before attempting repair of Critical Copper Pattern.

At IC Connections

To repair defective copper pattern at IC connections, use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections.)

1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary.)
2. Carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.

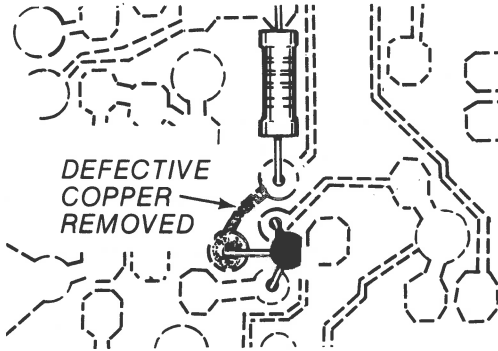


Install Jumper Wire and Solder

3. Bend a small "U" in one end of a small-gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.
4. Route the jumper wire along the path of the cut-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area, and clip off any excess jumper wire.

At Other Connections

Use the following technique to repair defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.



Insulated Jumper Wire

1. Remove the defective copper pattern with a sharp knife. Remove at least 1/4 inch of copper, to ensure that a hazardous condition will not exist if the jumper wire opens.
2. Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.
3. Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side. Carefully crimp and solder the connections.

CAUTION: Be sure the insulated jumper wire is dressed so that it does not touch components or sharp edges.

Frequency Synthesis (FS) Tuning Systems

1. Always unplug the instrument AC power cord before disconnecting or reconnecting FS tuning system cables and before removing or reinserting FS tuning system modules.
2. The FS tuner must never be disconnected from the FS tuning control module while power is applied to the instrument.
3. When troubleshooting intermittent problems that might be caused by defective cable connection(s) to the FS tuning system, remove the instrument AC power as soon as the defective connector is found and finish confirming the bad connection with a continuity test. This procedure will reduce the probability of electrical overstress of the FS system semiconductor components.

F013.1.2

SPECIFICATIONS:

Power Input:	120 Volts AC, 60Hz	Intermediate Frequency:	Picture I-F Carrier 45.75MHz Sound I-F Carrier 41.25MHz Color Subcarrier 42.17MHz
Power Consumption:	Manual Versions — 111 Watts-Maximum Beam Current 87 Watts-Average Beam Current Remote Versions — 121 Watts - Maximum Beam Current 96 Watts - Average Beam Current	Circuit Board Assemblies:	Main Chassis PW Bias/Drive PW 1000 (Transmitter) PW 2400 (MUV Module) PW 24000 (MST Module) PW 2500 (MSC Module) PW 4000 (VTCA) PW 4200 Auxiliary Control PW 5000 (Kine Driver/Socket)
Antenna Impedance:	300 Ohm Balanced UHF 300 Ohm Balanced VHF 75 Ohm Coaxial VHF	Modules:	MCR Remote Receiver MSC Frequency Synthesis Tuner Control MST Frequency Synthesis Tuner
Receiving Channels:	MST Versions— Band I 2 thru 6 Band II (A-5) thru C Band III D thru 13 Band IV J thru (W + 17) Band V 14 thru 83	Speakers:	3.5 inch round, 32 ohm 4.6 inch round, 32 ohm

CIRCUIT PROTECTION

Fuse (or Device)	Circuit Protected	Physical Location
F101 5.0 Amp	Main Fuse (A. C. Input)	A. C. Input Circuit
R120 Fusible Resistor	Power Supply	PW A.C. Board

Test Fixture Data

The following information is provided for adapting the CTC 117 chassis to TeleMatic/RCA Test Fixture 10J106 A/AX/B. and Test Jig adaptor 10J107.

Vertical/Horizontal Switch

Horizontal Impedance switch to — 1.9mH.
Vertical Resistance Switch to — 14.0 ohms.

Adaptors Required

Deflection Yoke — 10J696
Picture Tube Socket — 10J667
Degausser — Leave Open
Convergence — Not Required
Focus Supply — FVS3950

General Description

The CTC 120 chassis series uses a single-main circuit board design. The main circuit board contains nearly all the chassis circuitry. Circuits not contained on the main circuit board are: Kine Driver and A.C. Input.

The Kine Drive circuits are located on the PW 5000 Kine circuit board mounted on the picture tube socket. The A.C. input circuit is mounted on the chassis rail at the left rear of the chassis.

The CTC 120 chassis features a non-adjustable anode voltage of 25KV (nominal) driving a 19"/25" viewable Super AccuFilter 90° PIL picture tube. Many of the circuits in the CTC 120 chassis are similar to those in previous XtendedLife® chassis. For more detailed information see *Circuit Description* in this publication.

The CTC 120 is a "hot" chassis, it is necessary that all servicing be done with an isolation transformer to protect the service technician and his equipment.

Automatic Degaussing

This receiver is equipped with an automatic degaussing circuit which demagnetizes the picture tube each time the receiver is turned "ON" (receiver must be off for 5 minutes). The degaussing coil is mounted on the picture tube.

Automatic Fine Tuning (AFT)

The CTC 120 chassis is equipped with AFT. The AFT circuit is designed to change the local oscillator frequency to pull in an offset carrier. AFT, in most cases, has the capability of locking in on the carrier, whether it be an "off-air", cable, or video game signal.

Kine Arc Protection

The PW 5000 Kine Driver board assembly is equipped with spark gaps (slotted holes in board) for each active socket pin. In addition, a separate spark gap is used for focus. Common ground (Z1/Z2) for all spark gaps is connected to J5001. P5001 connects to the kine ground strap. The kine ground strap connects to chassis rail ground (J107).

Read "**Safety Precautions**", paragraph 3, page 2, of this service data before servicing chassis.

Circuit-Related Component Numbering

Serviceability of the CTC 120 series chassis is enhanced by logical physical arrangement of circuits on the main chassis circuit board. The board is segmented by **circuit area**, AND FURTHER ENHANCED BY PROMINENT ROAD MAPPING ON THE CIRCUIT BOARD. In addition, the component numbering system relates to general circuit areas:

100 series — AC input, Voltage regulator
200 series — sound processing
300 series — I-F/AFT, AGC, and Sync processing
400 series — Horizontal deflection, X-ray detection, pincushion processing
500 series — Vertical deflection
700 series — Luminance processing
800 series — Chroma processing
4200 series — Auxiliary Controls
5000 series — Kine drive circuits.

Cable TV (Multiband) Operation (Does Not Apply in Canada—see separate instructions)

In addition to normal broadcast reception of VHF channels 2-13 and UHF channels 14-83, instruments with multiband capability are equipped to receive up to 57 cable channels. To use these instruments on a cable TV system, place the Cable/Normal switch on the back of the set in the "Cable" or "C" position. (When shipped from the factory this switch is in the "Normal" or "N" position.)

With the switch in the "Cable" position, select cable TV programs on channels 2 through 13 in the usual manner. Select additional cable channels by referring to the following chart and tuning to the indicated UHF channel numbers.

Not all cable TV channels will be active on a particular cable TV system. Also, some cable companies may require the use of a Decoder with their cable TV system or they may not use the channel numbering system listed on the chart. Check with your local cable company for more complete information.

Note: For normal VHF/UHF reception areas (non-cable TV operation) the cable-normal switch must be in the normal position.

To receive cable channel:	A-5	A-4	A-3	A-2	A-1	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
Tune set to channel:	69	70	71	72	73	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35

To receive cable channel:	W	AA	BB	CC	DD	EE	FF	GG	HH	II	JJ	KK	LL	MM	NN	OO	PP	QQ
Tune set to channel:	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53

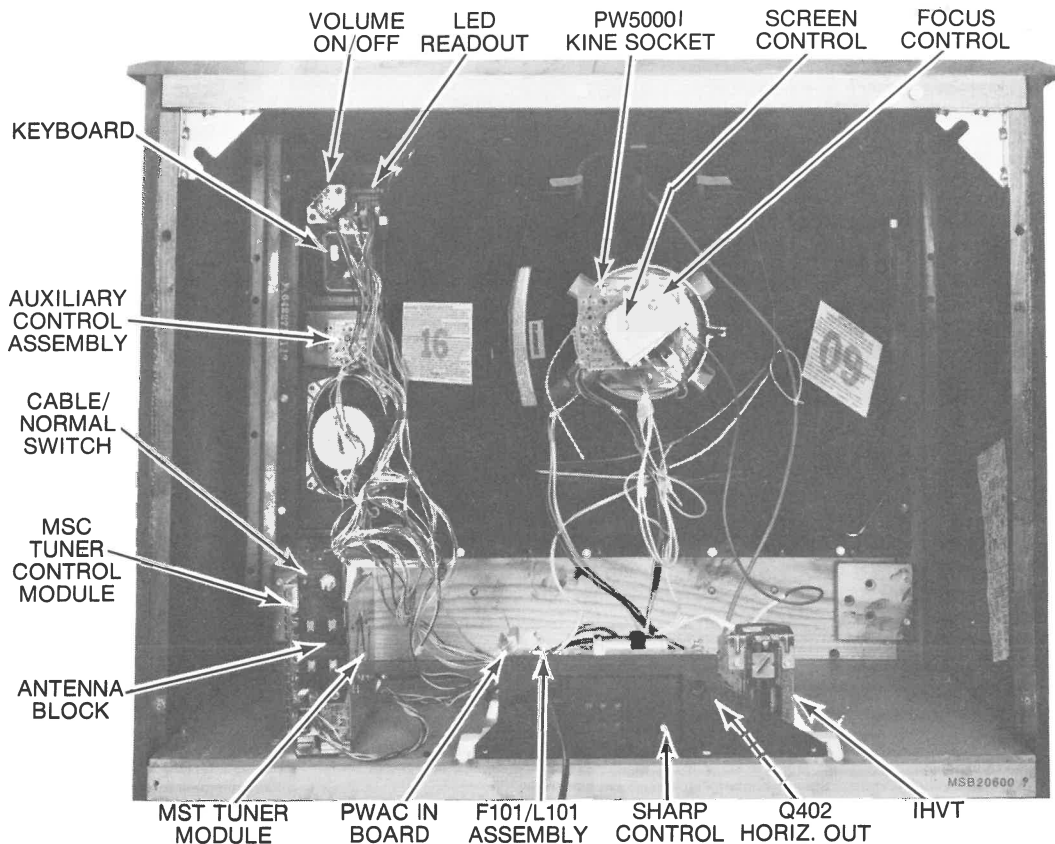


Fig. 1—Instrument Rear View (Typical)

AC Input and Initial Operation

AC power is supplied to the instrument through a line fuse, F101, and the chassis "on/off" switch to the fullwave bridge rectifier circuit, CR 101 through CR 104, which rectifies the line voltage and supplies DC to capacitor C105 which filters the AC ripple out of the DC voltage. The CTC 120 chassis is a "hot" chassis.

The raw B+ of 150 volts is also applied to the B+ regulator circuit (SCR 101). The SCR regulator provides a regulated B+ of +118V DC to the horizontal deflection circuitry. Regulated B+ is also supplied to the horizontal driver transistor through resistor R402 and diode CR 410, to supply initial B+ and reduce squegging at turn-on or until the horizontal drive B+ supply line begins operation of the horizontal driver transformer. The same 150V raw B+ is applied to capacitor C115 through resistors R115 and R116. C115 is initially uncharged and charges to a level determined by the magnitude of the raw B+ and the value of the two resistors and C115. As the oscillator starts (U401, pin 4) and U401 begins to draw current, C115 tends to "dump", recharges and dumps again and again until the system starts. Pulses from U401, pin 16 are applied to the base of horizontal driver transistor Q401, thru the driver transformer, T401, and consequently appears at the base of horizontal output transistor, Q402.

Simultaneously, a trigger pulse at pin 7 will appear, and is coupled via T101 to the SCR 101 gate. The cathode of the SCR is connected to the B+ regulation circuit.

IHVT B+ And Pulses Distribution

Most of the operational B+ supplies and pulse supplies are developed from the secondary windings of the integrated high voltage transformer (IHVT). There is no "hot/cold" barrier or isolated ground reference for the secondary power supplies.

The primary winding of the IHVT is driven by the horizontal output transistor, Q402. B+ for the primary winding is supplied by the SCR B+ regulator circuitry. The horizontal retrace pulses developed across the primary winding of the IHVT, as a result of the switching of the horizontal output transistor, are coupled to

the secondary windings of transformer T402. Many supply voltages for the instrument are derived from the secondary windings. Among these are the filament voltage and the second anode, focus, and screen voltages for the picture tube. The DC current return path for the high voltage supply is through the video circuit—U701, pin 28.

The main B+ source (+26V) for most of the chassis circuits is developed from pin 8 of the flyback transformer. A negative-going 200-volt pulse at pin 8 is "trace" rectified by CR 106 and filtered by C120. This develops a 26-volt source for the instrument. Since the 26-volt source is a trace-derived supply, it is capable of supplying a large amount of current.

Pin 10 of the IHVT develops horizontal pulses that are sampled by the X-Ray protection circuit. These pulses are monitored to allow the X-Ray protection circuit to disable the instrument if the amplitudes of the pulses are too high. Pin 13 of the IHVT has +200-volt retrace pulses present at the anode of CR107. These pulses are rectified by CR 107 and filtered by C105 to develop the 185-volt source for the instrument.

To provide the "turn-on" B+ to the horizontal driver stage to initiate horizontal output action, regulated B+ is applied through R402 and CR 410 to power the horizontal driver stage before the IHVT secondary windings begin producing output pulses.

Horizontal Deflection Synchronizing and Vertical Count-down IC

Integrated circuit U401 performs the operations of horizontal synchronization (formerly called horizontal oscillator) and vertical countdown. This combined circuit supplies both horizontal drive for the horizontal output stage and vertical drive for the vertical deflection amplifier.

A horizontal rate output pulse is coupled from pin 16 of U401 to horizontal driver transistor Q401. The driver stage drives the horizontal output stage. A vertical ramp output at U401, pin 18, drives the vertical output stage.

Horizontal sync is applied to pin 1 of U401. Vertical sync is applied to pin 24. Horizontal sync is applied to the input of the first phase control loop, and vertical sync is supplied to a vertical sync comparator for further processing.

The deflection chip is powered from a +10-volt supply. The 10-volt shunt regulator is located in the IC and is biased through the deflection start-up circuit of +26-volt supply via R116. Pin 5 of U401 is the source for the +10-volt supply.

Horizontal Dual-Phase Control Loop

The horizontal deflection synchronizing system uses a two-phase lock loop design and an oscillator operating at exactly 16 times the horizontal rate. The frequency of the oscillator is determined by the LC network between pins 4 and 5 of IC U401.

The first phase-lock loop controls the oscillator to maintain the control signal in proper frequency and phase with the horizontal sync signal. To compensate for load-dependent variations in the delay of the horizontal deflection stage, a second phase-lock loop is used. The second phase-lock loop includes a phase detector, one input of which is coupled from the output of the first phase-lock loop via a 4- μ s delay, and a second input which is coupled from the deflection output (IHVT). A loop filter, with a relatively fast time constant, is coupled to the output of the second phase detector (pin 13) for filtering the control currents to form a control signal which maintains proper phase relationship between video and horizontal yoke current.

The SCR regulator control circuit consists of an internal 6-volt zener and high voltage resupply (pin 11), and an error amplifier connected to the zener and to the B+ sensor (pin 10). The output of the error amplifier generates a signal which controls the SCR driver stage. Output of the SCR driver stage (pin 7) gates SCR 101 for B+ regulation control.

Vertical Countdown System

The vertical countdown portion of U401 is a two-mode system. One mode is the countdown operation; the other is a sync operation. The two modes of operation allow the system to be compatible with nonstandard sync signals. The IC vertical countdown circuits internally switch between the two modes of operation, depending upon the type of signal being received.

The vertical countdown concept is based on a 525-to-1 relationship between horizontal and vertical sync frequencies. The master oscillator in U401 oscillates at 251 kHz. The oscillator output is then divided by 16 to provide horizontal pulses, and by 525 to provide the proper vertical rate pulses.

The countdown system uses counters, shift registers, coincidence gates, flipflops, and other logic circuits to achieve the necessary functions for countdown.

Horizontal Driver

Horizontal drive pulses are derived from deflection chip U401. To obtain an output from pin 16, the master oscillator must be working. (If the oscillator is not working, the X-Ray circuit may be activated, disabling the oscillator.)

The output of the horizontal section of U401 (pin 16) is applied to driver transistor Q401. B+ for the driver stage is supplied from the 185-volt supply, which is developed from the IHVT. Initial B+ is required to enable the driver stage to drive the horizontal output before the 185-volt supply in the IHVT secondary can be developed. This supply is from the regulated B+ line through R402 and CR 410. The initial B+ voltage before the deflection system begins operating is approximately 130 volts at the cathode of CR 410.

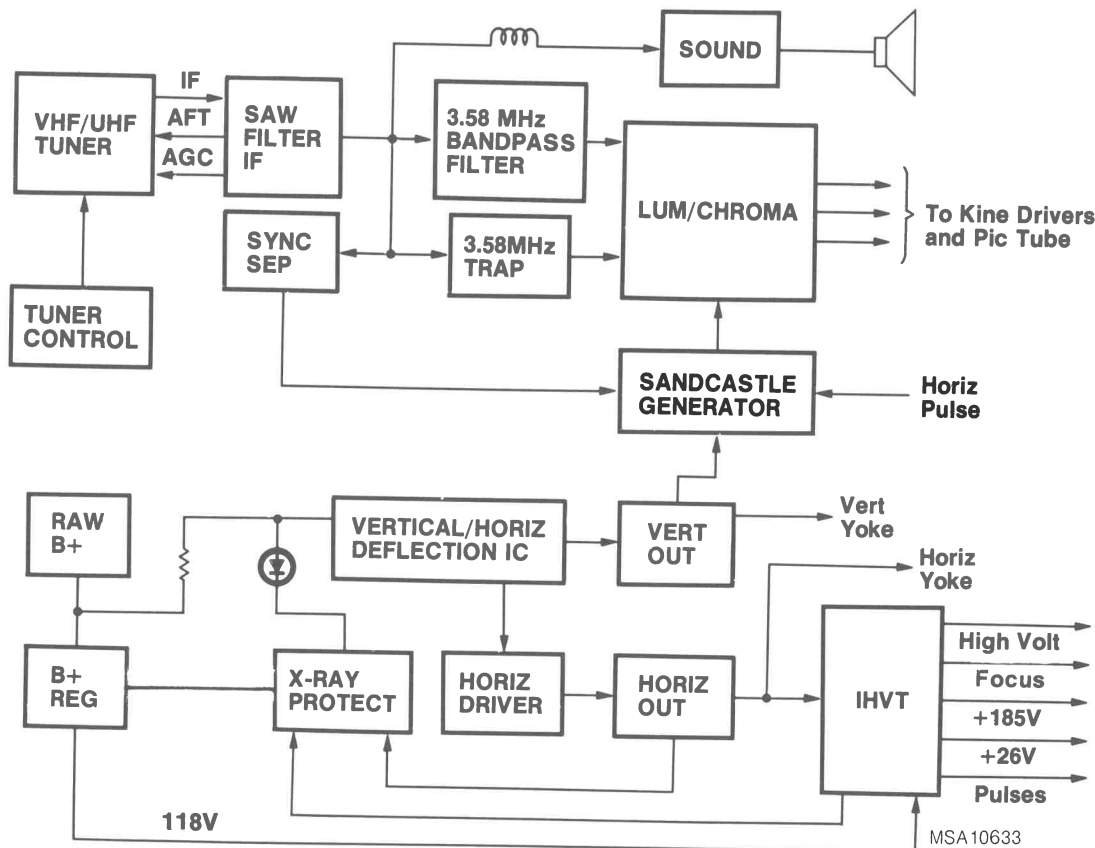


Fig. 2—Functional Block Diagram

Horizontal Output

Current is drawn from the regulated B+ supply through the IHVT primary winding and from the horizontal yoke winding to ground through horizontal output transistor Q402 and R418. Q402 turns off when the beam has reached the right edge of the picture tube, thus starting the beginning of horizontal retrace. After Q402 is turned off, the current through the horizontal yoke and the IHVT primary windings flows into C423, storing the energy from the system in retrace capacitor C423. Current then reverses and begins flowing from C423 back through the primary winding of the IHVT and through the horizontal yoke, placing the stored energy in the yoke and IHVT. This action deflects the electron beam from the right edge of the picture tube back to the left edge to begin the next line, completing retrace.

After the charge has been removed from C423, the current flow is then picked up by the damper diode, which begins conducting current from ground into the IHVT primary winding to B+ and through the Horizontal yoke winding to capacitor C425. The turning on of damper diode (CR 401) starts the beginning of the first half of the horizontal scan period. The first half of the horizontal scan continues as the current through the damper diode to the yoke and flyback decreases toward zero. When the current through the damper diode, and thus the current through the primary and yoke windings, is zero (the electron beam in the center of the picture), Q402 begins to conduct. This reverses the current flow and begins drawing current from the regulated B+ supply through the flyback primary winding and from the horizontal yoke winding to ground through R418—completing the second half of scan.

The horizontal yoke current also flows through two windings of transformer T403 into C425. The inductance of the two windings of T403 is controlled by the primary winding, which is driven by a DC voltage and a vertical rate parabola that is capacitively coupled by C427 from the vertical output stage. This provides side pin distortion correction of the displayed picture.

B+ Regulator Control

The B+ regulator provides line and load regulated B+ voltage to the horizontal deflection system. Since the deflection B+ is regulated, all supplies developed from deflection will also be line and load regulated. The turn on of the regulator SCR is controlled by U401, which drives current through the primary winding of T101. The current pulses driven through the primary winding of T101 are coupled to the secondary and applied to the gate of the SCR, turning the SCR on. The phase changes at which the pulses through the transformer primary winding occur, with respect to retrace, are controlled by deflection IC U401.

The phase at which the internal comparator is triggered is controlled by an error amplifier inside U401. The error amplifier compares the present regulated B+ voltage (pin 10) with an internal precision reference voltage. Size compensation is achieved by modifying this internal voltage reference as a function of line and load at pin 11. The output of the error amplifier is supplied to another comparator to control the firing time delivered to the SCR.

If the regulated B+ voltage begins to drop, the voltage at pin 10 begins dropping, which, in turn, signals the regulator control system to trigger earlier, thus causing the trigger pulse to the SCR to occur earlier.

If the regulated B+ is too high, the B+ voltage begins to increase. The voltage at pin 10 begins increasing, which, in turn, signals the regulator control system to trigger later, thus causing the trigger pulse to the SCR to occur later.

The regulation characteristics of the regulated B+ supply and the high voltage windings of the IHVT are made to "track" uniformly by the action of the high voltage resupply line. If not corrected, differences in regulation characteristics would cause picture size to change as the picture brightness changes. Pin 11 is supplied a sample of the high voltage resupply current, causing the B+ to decrease slightly as beam current increases. This maintains consistent picture size with changing brightness. In a similar manner, pin 11 is also supplied a sample of the raw (unregulated) B+ voltage, to allow the regulator to compensate for picture size changes due to line voltage changes.

Vertical Deflection

The vertical output stage is driven from the deflection chip (U401).

The vertical output "bottom" transistor acts as the driver transistor for the top output stage. Diodes provide the necessary switching and biasing functions. The main power supply for the vertical circuit is +26 volts, which is supplied through resistor R509—a 12-ohm resistor. Additional B+ to aid in retrace is supplied through resistor R506 from the regulated B+ supply.

The vertical drive signal is generated by charging C502 through the vertical size control to ground. Vertical retrace is initiated by an internal switch between pins 21 and 22 of U401, which discharges C502. As capacitor C502 charges and discharges, it generates a sawtooth voltage which is coupled via C503 to pin 20 of U401, where it is amplified and compared to the feedback voltage at pin 19. The feedback voltage is derived from the vertical yoke current through R518 and coupled via R508, to pin 19. This feedback maintains vertical yoke current linearity.

The vertical drive signal from pin 18 of U401 is applied to the base of bottom output transistor Q502. During the first half of scan, Q502 amplifies this signal and controls the base drive of Q501 through diode CR 504. During the second half of vertical scan, Q502 acts as an output device by pulling vertical yoke current through CR 505.

Pin 23 provides an output pulse that is supplied to the Sandcastle circuit to provide vertical blanking of the video signal during vertical retrace. In-depth output circuit operation is covered in the following circuit descriptions.

Vertical Output Trace

At the beginning of vertical scan, Q501 is in full conduction drawing current from the 26-volt supply through R509, CR 502, and the vertical yoke windings into capacitor C508. Q501 is turned on by the current flowing through the series combination of CR 501, R511, and R517 into the base of Q501. The bottom output transistor, Q502, shunts some of Q501 base current during the top half of scan by drawing base current through CR 504 and R513 through the collector/emitter of Q502. This shunting of base current causes the collector current through Q501 and into the yoke to begin decreasing. Q502 will continue shunting away the top output base current until it has shunted enough current to turn Q501 off. After Q501 is turned off due to base current being shunted into CR 504, the collector voltage of Q502 will continue to drop until CR 505 becomes turned on. This allows the yoke current to now flow through CR 505 and Q502 to complete the bottom half of scan. At this time, Q502 reverses the current flow through the vertical yoke windings by discharging capacitors C508 & C509 through the vertical yoke windings and CR 505 to ground through the collector/emitter of Q502.

Vertical Output Retrace

Current will continue flowing from the coupling capacitors through the vertical yoke and to ground through Q502 until the end of scan, at which time Q502 is turned off by the initiation of retrace from U401. At the time Q502 turns off, the current in the yoke is maximum. Since it is impossible to immediately stop current flow through an inductor, the current in the yoke continues flowing; however, since Q502 is off, the current now flows through diode CR 503 into the base-collector junction of the top output transistor, causing Q501 to conduct in the reverse mode (emitter to collector), storing retrace energy in C506 (3.3 μ F). Operation at the vertical output transistor in this mode is not degrading to the performance or reliability of Q501. CR502 and CR501 prevents retrace current from flowing into the 26-volt supply. C506 and the vertical yoke now form a series L-C-R resonant circuit during retrace.

As the resonant current flowing through the yoke and into capacitor C506 decreases toward zero, the beam is moved back toward the center of the picture tube. When this occurs, the top output transistor turns on and saturates due to the stored charge in C505. Q501 now begins conducting the energy stored in C506 back into the vertical yoke to move the beam to the top of the pic-

ture tube. To shorten the retrace time, the voltage at the top output transistor is boosted by regulated B+ during the second half of vertical trace. This supplies extra voltage to force current into the vertical yoke to move the beam back to the top of the picture tube.

At the end of the second half of vertical retrace, the current flowing through Q501 into the vertical yoke is now maximum. At this point, bottom output transistor Q502 is again turned on and begins shunting away base current from Q501 through diode CR 504. This begins the first half of the vertical trace.

X-Ray Protect/Overcurrent Shutdown Circuit

To prevent catastrophic failures, the CTC 120 chassis utilizes a shutdown circuit that will disable the set if the high voltage or power demand of the horizontal output circuit increases above predetermined limits.

There are two inputs to the shutdown circuit. One is a sample pulse (XRP) from the IHVT and the second from the emitter resistor, R418, in the horizontal output circuit. The sample pulse is rectified by CR 409 and under normal conditions develops 27-volts DC. This DC voltage is divided down to approximately 22 volts by R430 and R416 and applied to a 24-volt zener diode (CR 406). As long as the voltage remains below 24 volts, the zener will not conduct. During a malfunction where this voltage exceeds 24 volts, the zener conducts and turns "on" the shutdown SCR (SCR 401). The SCR connects R414 to ground. CR405 couples pin 4 of U401 to R414 which loads the horizontal oscillator to the point that the oscillator is disabled, shutting down the entire receiver. The SCR remains in conduction due to current from raw B+ flowing through R115, R116, L401, CR05 and R414 into SCR401. The SCR will "turn-off" when the AC switch is opened and the charge on C105 (Raw B+ filter) "bleeds off". Instruments with the remote feature "turn-off" SCR401 by shunting the anode current to ground through R117.

The second input to the shutdown circuit basically monitors the current through the horizontal output transistor. Any malfunction that causes this current to increase above normal limits activates the shutdown circuit.

11.4 Volt DC Regulator

The 11.4 Volt DC Regulator (Q302) is a simple regulator circuit. The base is tied to the +26 Volt source via resistor R324 and clamped to 12 Volts by zener diode CR 301. The collector is tied to the +26 Volt source via resistor R325. The resultant regulated 11.4 Volts DC present at the emitter of the regulator transistor, Q302, is then used as the main source of supply for I-F processing. A second regulated source, 10.7 Volts DC, derived from the 11.4V source via resistor R745, is used extensively throughout the remainder of the signal processing circuits.

SIGNAL PROCESSING

Tuning System Operation

There are three different tuning systems available with the CTC 120 color chassis. First are two conventional 18-position varactor tuning versions which tune VHF and UHF Channels 2 through 83. Second, a keyboard-controlled direct access tuner system and third, a scan up/down tuning system with remote control. The latter tuning systems can tune 127 channels consisting of 82 VHF/UHF, Midband, Superband, and Hyperband cable channels.

I-F Operation

The CTC 120 chassis has a semiconductor device called a Surface Acoustical Wave filter (SAW filter) and an I-F processor integrated circuit. These eliminate the I-F interstage tuned circuits. The SAW filter device generates the proper I-F responses without interstage transformers used in conventional I-F circuits. The SAW filter made it possible to consolidate the rest of the I-F oper-

ation in one integrated circuit in the CTC 120 chassis. The single I-F IC contains three stages of I-F amplification, synchronous video detection, AFT circuits, and the AGC circuits.

The SAW filter is made up of a piezoelectric material onto which are plated two pairs of transducer electrodes — one is the input transducer, and the other is the output transducer. The frequency response of the SAW filter is similar to a conventional discrete I-F system.

Since the I-F response is determined during SAW filter manufacture, field alignment of the I-F circuit is no longer necessary nor possible. The SAW filter characteristics cannot be changed after manufacture.

The I-F signal from the tuner is amplified by Q301. A 47.25 MHz trap in the base circuit of Q301 eliminates the adjacent channel sound carrier. The extra amplification is required to make up for the SAW filter insertion loss.

The output of the SAW filter is an I-F signal that has the proper frequency responses. It is applied differentially to the I-F IC. The signal passes through three stages of I-F amplification in the IC. The I-F signal then is applied to a synchronous video detector. Synchronous detection is used to provide the lowest possible distortion in the video output signal. After being detected, the video signal is amplified and passed through a noise inverter, and exits the IC as the composite video output signal. The composite video output of pin 12 is also coupled via T301 (also a 4.5-MHz trap) to TP 203 and utilized to supply sound carrier information to the sound circuit.

I-F AGC is developed internally in the I-F processor IC. It is used to vary the gain of the first, second, and third I-F stages. The I-F AGC is also compared against the setting of the R-F AGC control to develop the R-F AGC voltage.

Another feature of this I-F circuit is that the AGC voltage is no longer keyed by a horizontal pulse. This makes the horizontal oscillator pull-in more effective because phasing problems between the keying pulse and the transmitted horizontal sync are eliminated. The noise limiting circuit also eliminates the need for more conventional AGC circuits.

The I-F processor IC is powered from an external 11.4-volt regulated source (CR 301 and Q302). The AFT voltage supplied to the tuner is taken from pins 5 and 6 of the IC. Nominal AFT voltage is 6.5 volts (no signal applied).

Sync Separator

The 4.5 Volt p-p negative sync composite video signal from the video amplifier Q303 and Q304, is applied to the Sync separator transistor Q305. Output of the sync separator stage is positive going and is used to trigger the Burst/Clamp Keyer (Q801) and supplies sync to U401, pin 24.

Luminance/Chrominance Processing

The CTC 120 chassis utilizes a combined luminance/chrominance processing integrated circuit (U701) to provide all the processing for both the luminance and chrominance signal information. The combining of the two signal processing systems into one integrated circuit allows color and contrast tracking to be built into the integrated circuit.

The chroma input signal is applied to pin 3 of the integrated circuit. Color level adjustment is via a DC voltage to pin 2 of the integrated circuit. The 3.58-MHz local oscillator is controlled by pins 11, 12, and 13 of the integrated circuit. Pin 14 is the DC input for the Tint control. Pins 18 and 19 are the inputs for the phase-shifted 3.58-MHz oscillator which is used for I and Q demodulation of the chrominance signals.

Luminance information is applied to the integrated circuit at pin 27. The signal is then amplified and applied to the luminance/chrominance matrix amplifiers in the integrated circuit. The Contrast or picture level is set via a DC voltage applied to pin 26 of the integrated circuit. The output of the pix control amplifier in the IC is applied to the luminance amplifier channel, providing

color and contrast tracking. The pix control amplifier is also modulated by the beam limiting circuit, to provide contrast tracking with beam limiting.

The beam limiter circuit is controlled by the High Voltage Resupply line to the flyback and the customer Brightness control. Brightness is set by comparing the setting of the customer Brightness control (pin 24) to the level of the blue blanking output signal. During horizontal retrace, the brightness DC voltage and the level of the blue output blanking signal are compared, and a resultant voltage is developed which controls the brightness of the luminance amplifier. This maintains consistent brightness ratios dependent upon incoming blanking levels.

Brightness limiter operation is accomplished by sampling the DC beam current to the high voltage windings of the flyback through a resistor which is connected to pin 28 of the integrated circuit. With a normal brightness picture, the voltage at pin 28 of the IC is approximately 12 volts. As the beam current increases, the voltage at pin 28 drops. As the voltage drops below 12 volts, the beam limiter conducts, reducing the beam current by acting upon the luminance amplifier in the IC.

The luminance and chrominance signals are matrixed together in the matrixing amplifier. The output of the matrix amplifier is three color video signals, which are coupled through blanker/buffer stages to the output of the integrated circuit at pins 20, 21, and 22. Horizontal and vertical blanking are accomplished in the blanker/buffer output stages prior to exiting the integrated circuit.

The signals governing horizontal and vertical blanking, burst keying, and black level clamping are applied to the integrated circuit through pin 7. The input waveform consists of a matrixed combination of horizontal and vertical blanking and burst keying pulses. This input signal is called a "Sandcastle" signal (referring to the unique shape of the waveform). The integrated circuit has an internal decoder network that decodes the three signals and applies them to the proper circuitry in the integrated circuit.

Sandcastle Circuit

The Sandcastle input Waveform must be present for operation of the luminance/chrominance circuit. Without the Sandcastle input at pin 7 there will be no output from the luma/chroma integrated circuit. The Sandcastle signal is developed by transistor Q801 and associated diode circuitry. Vertical blanking information is coupled into pin 7 from deflection IC U401, pin 23. Horizontal blanking is accomplished by coupling a positive-going pulse into the cathode of CR 707 that clamps the anode of CR 706 at approximately -5 volts during scan. When a positive-going pulse enters the cathode of CR 707 during horizontal retrace, CR 707 turns off and CR 706 turns on, providing horizontal blanking at U701, pin 7.

Added to the signal at the anodes of CR 707/706 is the color keying and black level clamp signal. This signal pushes the IHVT reference signal to an approximate level of +8 volts during horizontal retrace. This signal is developed from horizontal sync by

coupling sync into the base of Q801. C822 and L806 in the collector of Q801 generate a ringing pulse when sync is applied. CR 705 couples the positive-going portion of the pulse to the junction of diodes CR 707 and CR 706. The normal Sandcastle pulse can be viewed at TP 806.

Picture Tube Circuitry

Red, blue, and green drive information is applied to the base of bias transistors Q704, Q705, and Q706. The drive controls vary the gains of the respective bias transistors. The DC voltage of the collectors of the driver transistors is controlled by the setting of the appropriate bias controls. The collector terminals of bias transistors Q704, Q705, and Q706 are connected to the emitters of kine driver transistors Q5001, Q5002, and Q5003. The output of the chroma/luminance IC is applied to the base of the bias transistors and varies the collector currents. This causes voltages at the collector of the kine driver transistors to be modulated. The variations in collector voltage of the kine driver transistors are applied to the cathodes of the picture tube, modulating the beams of the three guns.

Collector supply for the kine driver transistors is 185 volts supplied from the IHVT. The control grid of the picture tube is set to a low positive potential. Focus and screen voltages are supplied to the picture tube from the combined focus-screen assembly, which is located on the rear of the kine socket. The focus/screen supply voltages are generated by the IHVT. The current through the focus and screen controls is returned to the high voltage resupply point so that focus/screen tracking from low to high beam is improved.

Sound Processing

New to the CTC 120 chassis is an ingenious method to include the sound take-off coil as part of the 4.5-MHz trap at the output of the picture IF detector — pin 12 of IC U301. This novel approach has allowed for improved performance, reduced cost, and simpler alignment. The conventional 4.5-MHz trap coil is adjusted to minimize the 4.5-MHz signal passed to the first video amplifier. In this new circuit, when T301 is adjusted to minimize the 4.5-MHz signal at the input of the first video amplifier, Q304, the sound take-off signal is maximized at TP 203.

The 4.5 MHz sound information is processed in very much the same manner as in previous unitized chassis. The 4.5 MHz after being bandpassed thru coil L202, is fed into the Sound Processor IC, U201, at pins 14 and 15, where it is first amplified and demodulated. Customer Volume Control R4201 provides a variable DC bias to gain-controlled stages in the preamplifier which permits control of the audio level. The audio signal is then transferred to the output via Capacitor C201 (pins 2 and 4) to a 32 ohm impedance load (either speaker or earphone).

Disassembly information about assemblies unique to a specific model is covered in a supplement to this service data. See appropriate supplement.

Cabinet Back Removal

Before removing the cabinet back read "Safety Precautions" on page 2 of this Service Data.

1. Disconnect power cord from AC outlet.
2. Disconnect antenna leads from antenna block assembly at left of cabinet rear.
3. Remove $\frac{1}{4}$ " hex head screws from outer edge of cabinet back at antenna block and each side of service controls. The cabinet back is now free to be pulled to the rear and off the instrument.

Note: After the back is removed, DO NOT TILT the cabinet backward as the chassis will slip rearward.

4. To replace cabinet back, reverse procedure.

Chassis Servicing Position/Removal

The main chassis circuit board slides into the chassis mounting guides which are a part of the cabinet shelf. With back removed, slide the chassis to the rear just far enough to gain access to interconnecting plug and cable assemblies. Much of the servicing can be performed with the chassis in this position. For chassis removal, disconnect the following:

- P1MCR (PWAC)
 - P3MSC (channel display)
 - P104 connector (degaussing)
 - P106 connector (remote power to MCR module - if applicable)
 - P201 connector (speaker)
 - P202 connector (volume-if applicable)
 - P302 connector (interconnect to MSC module/VTCA)
 - P401 & P501 connectors (yoke assembly)
 - P701 (auxiliary control)
 - PW5000 circuit board & picture tube socket assembly
 - P107 connector (spark gap grounding - PW5000 to kine grounding)
 - P5007 connector (picture tube grounding to chassis railground)
 - Ultor anode lead from picture tube
- The chassis may now be removed from the instrument.

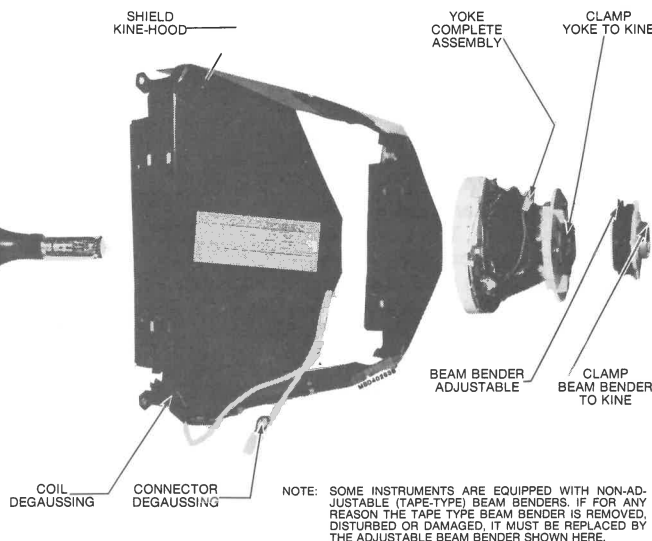


Fig. 3A—Picture Tube Assembly (19" version)

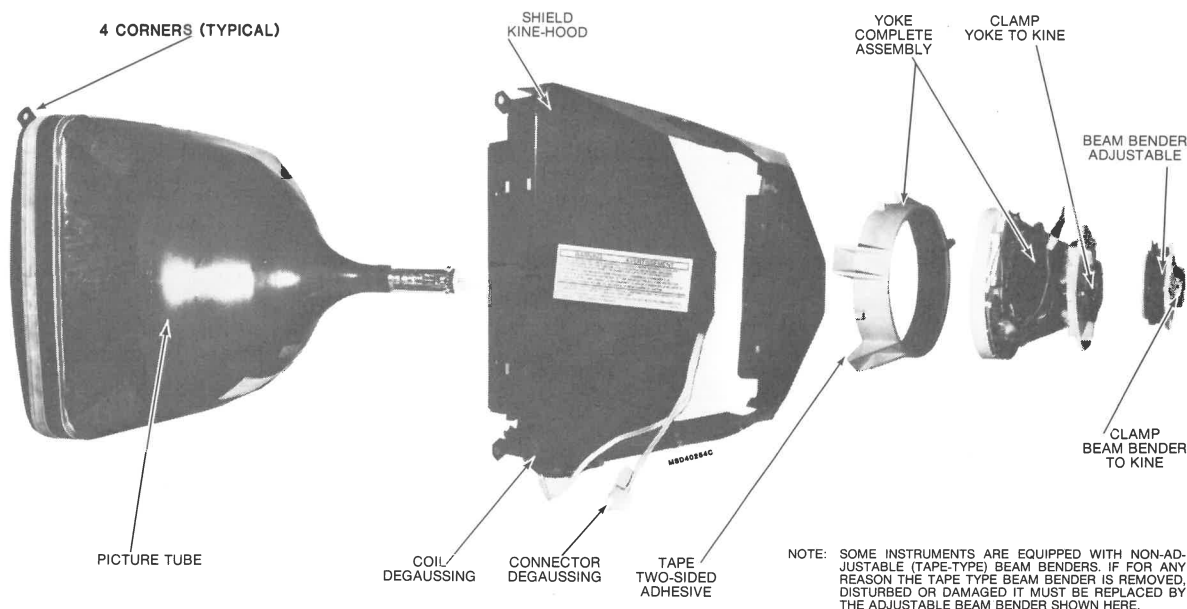


Fig. 3B—Picture Tube Assembly (25" version)

Deflection Yoke and Beam Bender Assembly Removal

1. Disconnect picture tube socket (PW 5000) and deflection yoke plugs.
2. Remove beam bender from neck of picture tube. For adjustable type, loosen Phillips head screw on beam bender clamp and slide beam bender to the rear and off the neck of the picture tube. For magnetic tape type, simply remove and replace with adjustable type.

Note: The magnetic tape beam bender version is not adjustable and cannot be reused. Replace the magnetic tape type with the ADJUSTABLE BEAM BENDER. Consult replacement parts for proper stock number. See Fig. 6 for the proper placement of the beam bender on the neck of the picture tube.

3. Loosen $\frac{1}{4}$ " hex head screw on yoke clamp. Move the yoke assembly away from the picture tube bell and slide assembly back to remove.
4. To reassemble, reverse procedure. Refer to Fig. 7 for proper beam bender placement on neck of picture tube. Note: Purity and convergence procedures must be performed each time the yoke and beam bender are removed.

Picture Tube Removal and Replacement (Fig. 3)

Caution: Read 'Safety Precautions' Item 6 page 2, before removing or replacing picture tube.

1. Remove chassis and lay cabinet, front down, on rubber pad or soft cloth.
2. Remove beam bender and deflection yoke assemblies. (Note: Magnetic tape version beam bender cannot be reused).
3. Release cable straps and sniveys holding the degaussing coil assembly to the picture tube.
4. Disconnect P104/J104 (degaussing), P5001/J5001 (picture tube/kine socket) ground and P107/J107 (kine socket/chassis rail) ground.
5. Remove four (4) $\frac{5}{16}$ " hex head screws, one in each corner of picture tube.
6. Using caution, lift picture tube up and out.
7. Remove degaussing coil assembly and ground strap assembly from picture tube.
8. To reassemble, reverse procedure. Consult Replacement Parts List for stock number of correct Adjustable Beam Bender and Fig. 7 for proper installation.

Read "Safety Precautions" on page 2 of this service data before servicing receiver.

X-Radiation Protection Circuit Test

When service has been performed on horizontal deflection, high voltage, or B+ regulator system, the X-Radiation protection circuit should be tested for proper operation as follows:

1. Apply 120V AC using a variac transformer for accurate input voltage.
2. Allow for warm up and adjust all customer controls for normal picture and sound.
3. Locate stakes labeled XT1 and XT2 on the main chassis circuit board and schematic (zone 9-G).
4. Measure the voltage at XT2. It must measure between 23.3V and 27.7V DC.
5. Short stake XT1 to stake XT2 with a short clip lead momentarily. When stakes are shorted together momentarily the instrument should shut-down.

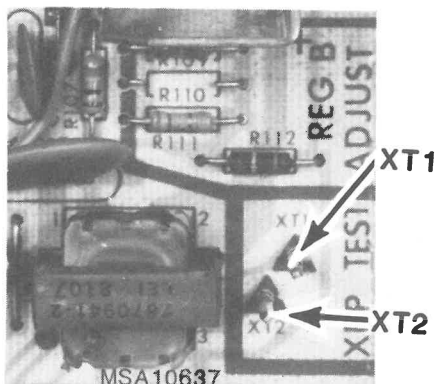


Fig. 4—X-Ray Protection Circuit Test

AGC Delay

The AGC Delay control (R334) has been preset at the factory for optimum operation over a wide range of R-F signal input conditions. Readjustment of R334 should not be considered unless: VHF tuner has been replaced. I-F circuit has been repaired, control (R334) has been misadjusted or unusual local signal conditions exist such as:

1. Cable TV — adjacent channel interference.
2. Picture bending and/or Channel 6 color beats which are usually due to excessive R-F signal input when receiver location is close to transmitting tower or when receiver is connected to an antenna distribution system where R-F signal has been amplified. Signal should be attenuated at the antenna with pad or filter to a more satisfactory signal level.
3. Picture noise is caused by "broadcast noise" or weak signal. If broadcast is "clean" and the received R-F signal is at least 1mV, the picture will be noise free in any area.

Adjusting the AGC Delay control to one end of rotation will usually provide a relatively poor signal-to-noise ratio, and at the other extreme end of rotation a degradation of overload capabilities such as Channel 6 color beat or Cable TV adjacent channel interference.

If AGC Delay control (R334) is adjusted, check all local channels for proper operation.

Vertical Size

At nominal 120V AC line voltage, adjust vertical size control (R534) on chassis rear apron for $\frac{1}{8}$ " overscan at the top and bottom of the picture screen.

Horizontal Width

The horizontal deflection system should not overscan by an appreciable amount.

If the picture tube, deflection yoke or high voltage transformer is replaced and results in underscanning, capacitor C424 may be added.

Horizontal Master Oscillator Frequency Adjust

The CTC 120 chassis has no customer operated vertical hold or horizontal hold control. To adjust oscillator, short TP 401 to ground. Adjust oscillator frequency coil (L401) for stable or slowly floating horizontal picture (zero beat). Remove short.

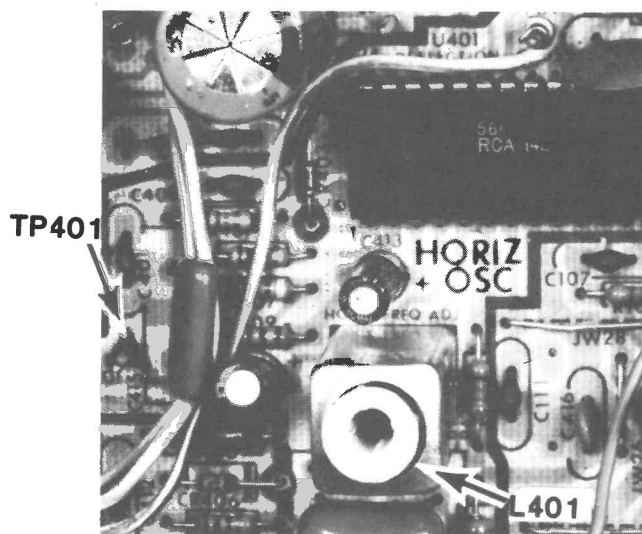


Fig. 5—Horizontal Frequency Adjust

Focus Adjustment

Adjust brightness control (R4202) and contrast control (R4207) fully CW to insure maximum kine beam current. Adjust focus control (part of kine socket assembly) for best overall focus on an inactive UHF channel (UHF snow).

Restore brightness and contrast controls to normal viewing level.

High Voltage

High voltage is not adjustable

To measure high voltage, adjust brightness control (R4202), contrast control (R4207) and color control (R4203) fully CCW to insure minimum beam current. Defeat LDR circuit (ColorTrak models only) by shorting across J702 circuit on main circuit board.

Connect the high voltage probe of a VTVM to the picture tube high voltage anode button (use 500V scale). Measure the high voltage.

Note: The meter (VTVM with probe) used for measuring high voltage must have a resistance of 1000 megohms or more and be accurate within 5% or better.

High voltage for the CTC 120 chassis is 25kV when measured with a VTVM as described, and must not exceed 32.0kV under any circumstances.

Service Line/White Raster Procedure

A service line can be obtained (for color temperature adjustments) in the following manner:

1. Short stake SS1 to stake SS2. Make sure that neither stake is shorted to ground accidentally.
2. Short stake SS3 and stake SS4 to ground.

The stakes are located on the main circuit board.

To obtain a White raster, as required for screen purity and color temperature adjustments, short stake SS4 (on main circuit board) to ground, and turn color control fully CCW.

Degaussing

Automatic Degaussing Circuit — should contamination (color blotches) occur, the operation of automatic degaussing coil (L102) can be checked in the following manner:

Turn off the receiver to allow RT 101 on main circuit board to cool. Disconnect degaussing plug P104 from J104. After RT 101 has cooled down, turn the receiver on. While observing the picture, plug in the degaussing coil and observe the momentary action as degaussing takes place.

Sharp (Peaking) Control

Clockwise rotation of Sharp Control (R4209, on the chassis rear apron) increases picture sharpness while a softer picture is obtained by turning the control counterclockwise. This control should be adjusted to optimize the quality of the picture.

Chroma Peak Level, Contrast Preset

These controls are preset at the factory and should require no further adjustment. However, if alignment is performed, adjustment may become necessary.

Set Up 19"

Allow sufficient instrument warmup time: To ensure maximum long term stability of Purity, Convergence, and Color Temperature adjustments, the receiver should be operated a minimum of 15 to 20 minutes prior to performing these adjustments.

The color temperature on this television receiver is set to 6500 degree Kelvin (warm white) at the factory. This temperature value produces the truest color reproduction, providing the best possible color picture. It is possible that during the first few minutes of operation the picture may have a slight tinted appearance, due to warmup characteristics of the picture tube guns and/or circuits.

DO NOT adjust color temperature above 6500 degree Kelvin (towards a blue white).

Adjusting color temperature to other than 6500 degree Kelvin will NOT produce the optimum color picture this receiver is capable of providing.

Purity Adjustment

Note: If center purity adjustment is required and a magnetic tape beam bender is mounted on the neck of the picture tube, it

must be replaced with an ADJUSTABLE TYPE BEAM BENDER. Consult replacement parts list for proper stock number and Fig. 6 for proper installation.

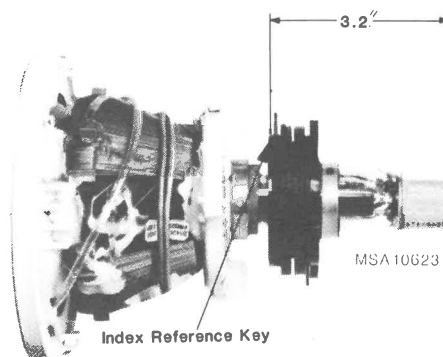


Fig. 6—Beam Bender Placement

The front pair of magnets (closest to the deflection yoke) on the Beam Bender Assembly are two-pole magnets designed to move all three beams uniformly in both direction and amplitude. Spreading the tabs causes the three beams to be offset prior to entering the yoke field such that their trajectory is altered and results in their passing through the slots in the shadow mask at a different angle and striking the phosphor stripes in a different horizontal location thus providing purity adjustment (control).

Face receiver in north or south position to make purity adjustments. This assures that any effect of the earth's magnetic field upon beam landing will be negligible when the receiver is finally placed in any viewing position.

The receiver should be at room temperature (60 degrees or above for six hours) and be operating at high beam current (full brightness and contrast) for at least ten (10) minutes.

See Fig. 6 for beam bender placement. The 3.2 inch (8.13 cm)

DIMENSION IS CRITICAL. (Index reference key or pointer on the beam bender housing must be set top center for the unit to operate properly). Tighten beam bender clamp.

Converge center of raster (when adjustable type beam bender is utilized) per convergence instructions.

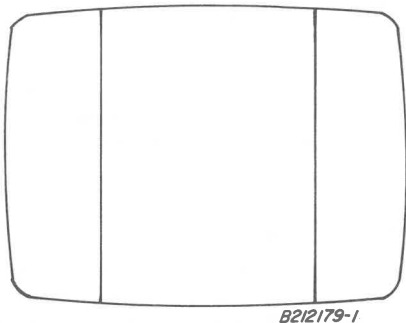


Fig. 7—Center Vertical Green Raster

Obtain white raster by shorting stake SS4 to ground and turn screen control CW to obtain bright raster.

Purity adjustments must be made observing the green color field only as any mis-convergence on the red and blue fields will show up as additional purity errors. Turn red and blue bias controls (R750 and R754) fully **CCW**. Turn green bias control (R752) **CW** to obtain green raster.

Static (Center) Purity

1. Loosen deflection yoke neck clamp and slide deflection yoke all the way forward. Tighten yoke neck clamp screw to hold, but not to full torque.
2. Loosen beam bender lock ring (turn in **CCW** direction from rear). Loosen only enough to permit movement of rings.
3. See Fig. 10, purity magnets are the front pair of magnets closest to the yoke. Starting with the tabs together pointing straight up (12 o'clock) or straight down (6 o'clock), spread the tabs an equal distance apart from the vertical center line until the green vertical raster is centered horizontally on the screen as in Fig. 8. **DO NOT ROTATE** the pair of magnets (together) **CW** or **CCW** away from vertical center. Rotating together will only decrease the effect of the two pole magnets on the desired horizontal movement of the green beam and will introduce vertical offset (centering) to the raster.
4. Tighten beam bender lock ring (turn in **CW** direction from rear until finger tight).

Dynamic (Edge) Purity:

5. Slowly move the deflection yoke to the rear to obtain best overall green raster. Loosen the neck clamp only enough to

permit movement of the yoke. Do not allow the front of the yoke to slump down appreciably while performing this operation or undesired axial yoke movement may result when later tightening yoke neck clamp.

6. Rotate yoke to level raster while carefully maintaining axial location of yoke.
7. Tighten yoke neck clamp securely (6 in. - lb.) while supporting yoke in front such that the neck clamp draws down flat on the neck and is not twisted on the anchor tape underneath.
8. Check purity on blue and red rasters to ensure that good purity has been obtained on each respective field.

Impurities in these two rasters may indicate that convergence errors are also present and should be checked (corrected) before attempting readjustment of purity.

9. Perform color temperature adjustment and check for uniform white screen. If uniformity has not been obtained, reconverge center of screen and repeat purity adjustment. Remove shorting clip from stake SS4 to ground and turn screen control fully **CCW**.

Color Temperature Adjustments

For optimum color temperature adjustments, turn channel selector to an active program channel.

1. Preset - brightness (R4202) and contrast (R4207) controls to mid-range.
Obtain service line (see procedure).
Color bias controls (R754, R752, and R750) fully **CCW**.
Color drive controls (R758, R756) fully **CW**.
Screen control fully **CCW**.
 2. Advance Screen Control **CW** to just produce a thin horizontal line at center screen (either blue, green or red).
 3. Depending on color of line produced in Step 2, advance remaining color bias controls (**CW**) to just produce a horizontal white line.
- Note:** At completion of color bias control adjustment one of the bias controls must remain fully **CCW**.
4. Advance brightness (R4202) and contrast (R4207) controls fully **CW**.
Remove shorts between stakes SS1 and SS2 and from stakes SS3 and SS4 to ground. Obtain white raster by shorting stake SS4 to ground.
 5. Adjust color drive controls (R758 & R756) to obtain a 6500° Kelvin scale temperature (warm white). Remove shorting clip from stake SS4 to ground.
 6. Check lowlight to highlight gray scale tracking (black and white picture). Should any color other than gray or white be dominant in lowlight to highlight areas, the temperature settings have not been properly performed. Repeat preceding steps. Color bias controls adjust lowlight (dark) areas and color drive controls adjust highlight (white) areas.

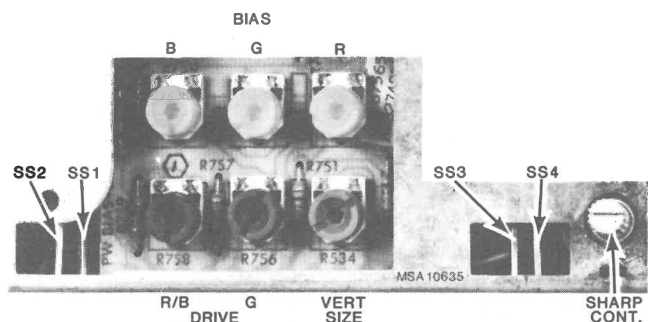


Fig. 8—Color Temperature Adjustments

Center Convergence (Figure 9)

Note: The Magnetic tape type beam bender is non-adjustable. This procedure is for adjustable eccentric beam bender only. Center convergence is accomplished by two (2) pairs of eccentric magnets on the beam bender assembly.

In observing the picture tube from the viewing side of the screen, both the beam assembly (cathode guns) and the phosphor lines are oriented in an opposite manner. That is green is the center line and cathode gun, and is flanked on the left by the red line (and blue cathode gun). Similarly, the blue line (and red cathode gun) is on the right. For this reason, the beam bender assembly is designed to move Red and Blue, with Green being the stationary reference color.

The middle pair of magnets are off-set so as to provide movement of the blue beam only and are used to adjust the convergence of blue upon green at the center of the screen.

The rear pair of magnets are off-set so as to provide movement of the red beam only and are used to adjust the convergence of red upon green at the center of the screen.

The direction of convergence correction for either set of rings is controlled by rotating the rings fixed relationships to each other around the neck of the tube and the amplitude of convergence correction is obtained by counter-rotating (spreading apart tabs) the rings.

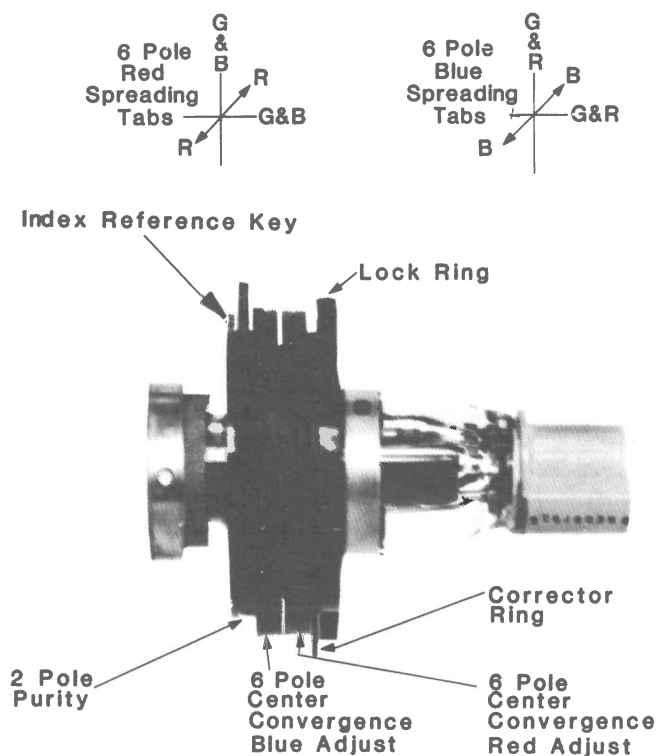


Fig. 9—Beam Bender Assembly Adjustable Type

1. Connect dot/bar generator to VHF antenna terminals and adjust brightness and contrast controls to produce distinct pattern.
2. Loosen beam bender locking ring, at rear of assembly, so that convergence rings can be moved without binding. Do not loosen locking ring anymore than necessary.
3. Separate center set of magnet tabs by approximately one tab width. Rotate center set of magnets (as a unit) to minimize the separation of the blue and green center dots. Adjust spacing of the center magnet tabs to converge the blue and green center dots.

4. Separate rear set of magnet tabs by approximately one tab width. Rotate rear set of magnets (as a unit) to minimize the separation of the red to the blue and green center dots. Adjust the rear magnet tabs spacing to converge the red center dot to the blue and green center dots.

Note: If center dot convergence cannot be obtained in steps 3 and 4, move the corrector ring (Figure 10) 90 degrees from its present position. This introduces enough shift in the beams to obtain center dot convergence by repeating steps 3 and 4.

5. Repeat steps 3 and 4 to achieve optimum blue to green and red to green and blue center dot convergence.
6. Tighten the beam bender locking ring securely (Caution: do not over tighten).

Dynamic Edge Convergence (Fig. 10)

Edge convergence is achieved by tilting the front of the deflection yoke up-down ("Y" axis) and left-right ("X" axis).

Good center convergence is desired before attempting edge convergence.

Note: Center convergence adjustment requires an **ADJUSTABLE TYPE BEAM BENDER**.

1. Temporarily remove 3 wedges from under front of yoke.
2. Using wedge at 1:00 position move yoke vertically (rocking motion) for balance of red and blue vertical lines at 12:00 (top) and 6:00 (bottom) so they are separated equally (if any) and do not cross over each other (opposite sides at top and bottom).
3. Stick down 1:00 wedge.
4. Move yoke horizontally (rocking motion) to balance red and blue raster heights at top and bottom such that the red and blue horizontal lines at 12:00 (top) and 6:00 (bottom) are separated equally (if any) both red lines high or low, but not either one high at top and low at bottom.
5. Replace remaining wedges at 5:00 and 9:00 and stick down while maintaining the position of the yoke.
6. Check for overall convergence and purity and repeat Steps 1 through 5 as needed.
7. Place anchor tape over three wedges.

Note: Because of the interaction of purity and convergence adjustments, repetition of adjustments may be necessary to obtain best results.

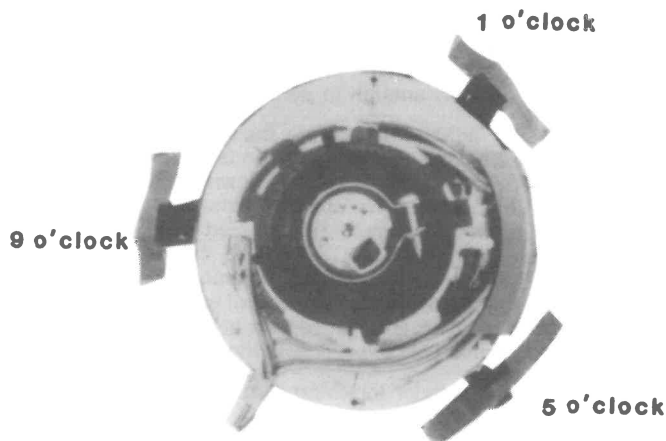


Fig. 10—Edge Convergence—Yoke Cushion (Wedge Placement)

Set Up 25"

Allow sufficient instrument warmup time: To ensure maximum long term stability of Purity, Convergence, and Color Temperature adjustments, the receiver should be operated a minimum of 15 to 20 minutes prior to performing these adjustments.

The color temperature on this television receiver is set to 6500 degree Kelvin (warm white) at the factory. This temperature value produces the truest color reproduction, providing the best possible color picture. It is possible that during the first few minutes of operation the picture may have a slight tinted appearance, due to warmup characteristics of the picture tube guns and/or circuits.

DO NOT adjust color temperature above 6500 degree Kelvin (towards a blue white).

Adjusting color temperature to other than 6500 degree Kelvin will NOT produce the optimum color picture this receiver is capable of providing.

Purity Adjustment

Note: If center purity adjustment is required and a magnetic tape beam bender is mounted on the neck of the picture tube, it must be replaced with an ADJUSTABLE TYPE BEAM BENDER. Consult replacement parts list for proper stock number and Fig. 11 for proper installation.

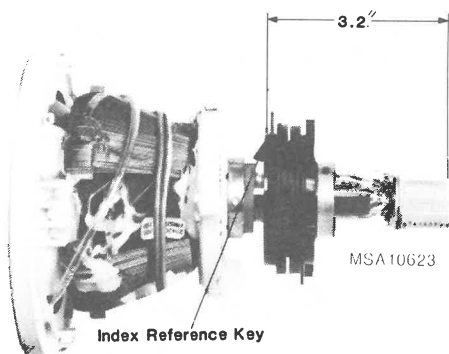


Fig. 11—Beam Bender Placement

Face receiver in north or south position to make purity adjustments. This assures that any effect of the earth's magnetic field upon beam landing will be negligible when the receiver is finally placed in any viewing position.

The receiver should be at room temperature (60° or above for six hours) and be operating at high beam current (full brightness and contrast) for at least ten (10) minutes.

Converge center of raster (when adjustable type beam bender is utilized) per static convergence instructions.

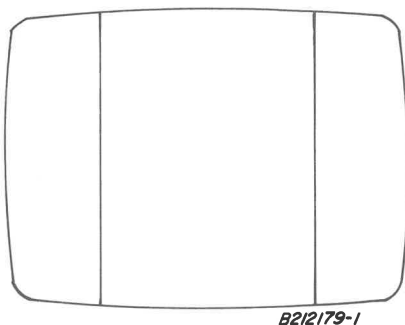


Fig. 12—Center Vertical Red Raster

Obtain white raster by shorting stake SS4 to ground and turn screen control CW to obtain bright raster.

1. Purity adjustments are most accurate when observing one color field only, preferably red. Turn blue and green bias controls (R754 & R752) fully CCW. Turn red bias control (R750) CW to obtain red raster.
2. Loosen deflection yoke clamp (Phillips head) and yoke housing retaining (1/4" hex head) screws. Slide yoke back, as close as possible to beam bender assembly.
3. If instrument is equipped with adjustable beam bender loosen beam bender locking ring (turn in CCW direction). Rotate beam bender purity tabs (forward most pair of tabs) to center vertical red raster on screen. Tighten beam bender locking ring, (turn in CW direction until finger tight).
4. Slide deflection yoke all the way forward to bell of picture tube then pull back as far as necessary to obtain best overall red raster.
5. Tighten deflection yoke housing retaining screw.
6. Check purity on blue and green raster, to ensure that good purity has been obtained on each respective field.
7. Perform color temperature adjustments and check for uniform white screen. If uniformity has not been obtained, reconverge center of screen and repeat purity adjustments. Remove shorting clip from stake SS4 to ground and turn screen control fully CCW.

Color Temperature Adjustments

For optimum color temperature adjustments, turn channel selector to an active program channel.

1. Preset - brightness (R4202) and contrast (R4207) controls to mid-range.
Obtain service line (see procedure).
Color bias controls (R754, R752, and R750) fully CCW.
Color drive controls (R758, R756) fully CW.
Screen control fully CCW.
2. Advance Screen Control CW to just produce a thin horizontal line at center screen (either blue, green or red).
3. Depending on color of line produced in Step 2, advance remaining color bias controls (CW) to just produce a horizontal white line.

Note: At completion of color bias control adjustment one of the bias controls must remain fully CCW.

4. Advance brightness (R4202) and contrast (R4207) controls fully CW.
Remove shorts between stakes SS1 and SS2 and from stakes SS3 and SS4 to ground. Obtain white raster by shorting stake SS4 to ground.
5. Adjust color drive controls (R758 & R756) to obtain a 6500° Kelvin scale temperature (warm white). Remove shorting clip from stake SS4 to ground.
6. Check lowlight to highlight gray scale tracking (black and white picture). Should any color other than gray or white be dominant in lowlight to highlight areas, the temperature settings have not been properly performed. Repeat preceding steps. Color bias controls adjust lowlight (dark) areas and color drive controls adjust highlight (white) areas.

Static Convergence (Figure 9)

Note: The Magnetic tape type beam bender is non-adjustable. This procedure is for adjustable eccentric beam bender only. Center dot static convergence is accomplished by two (2) sets of eccentric magnets on the beam bender assembly.

The center set of magnets are adjusted to converge blue to green and the rear set of magnets (close to base of picture tube) are adjusted to converge red to green; green is stationary.

1. Connect dot/bar generator to VHF antenna terminals and adjust brightness and contrast controls to produce distinct pattern.
2. Loosen beam bender locking ring, at rear of assembly, so that convergence rings can be moved without binding. Do not loosen locking ring anymore than necessary.
3. Separate center set of magnet tabs by approximately one tab width. Rotate center set of magnets (as a unit) to minimize the separation of the blue and green center dots. Adjust spacing of the center magnet tabs to converge the blue and green center dots.
4. Separate rear set of magnet tabs by approximately one tab width. Rotate rear set of magnets (as a unit) to minimize the separation of the red to the blue and green center dots. Adjust the rear magnet tabs spacing to converge the red center dot to the blue and green center dots.
5. Repeat steps 3 and 4 to achieve optimum blue to green and red to green and blue center dot convergence.
6. Tighten the beam bender locking ring securely (Caution: do not over tighten.)

DYNAMIC CONVERGENCE

Dynamic Convergence (Figures 13, 14, & 15)

Dynamic convergence is achieved by tilting the rear of the deflection yoke up - down ("Y" axis) and left - right ("X" axis).

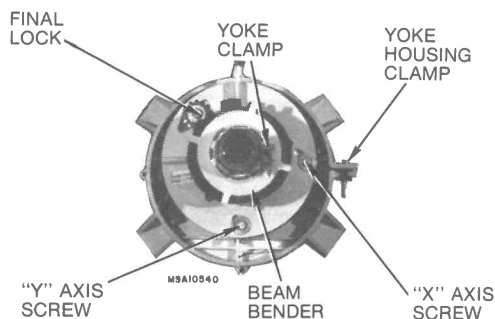


Fig. 13 — Yoke Assembly (Rear View)

Static (centerdot) convergence is required before attempting dynamic convergence. (Note: Centerdot convergence adjustment requires an ADJUSTABLE TYPE BEAM BENDER.)

1. Loosen yoke clamp retaining screw.
2. Loosen top and bottom balance ("Y" axis) adjustment retaining screw located at 6 o'clock and final lock retaining screw at 10 o'clock on rear of deflection yoke.
3. Applying top to bottom rocking motion to tab at 9 o'clock on rear of deflection yoke, balance convergence error of vertical lines top and bottom, both in magnitude and direction.
4. Tighten top and bottom balance ("Y" axis) adjustment retaining screw located at 6 o'clock.
5. Loosen side balance ("X" axis) adjustment retaining screw located at 3 o'clock.
6. Applying side to side rocking motion to tab at 12 o'clock on rear of deflection yoke, balance the convergence error of horizontal lines top and bottom, both in magnitude and direction.
7. Tighten side balance adjustment retaining screw, located at 3 o'clock and final lock retaining screw, located at 10 o'clock.

Note: Retaining screws require 4 inch pound \pm 1 inch pound torque tightening power.

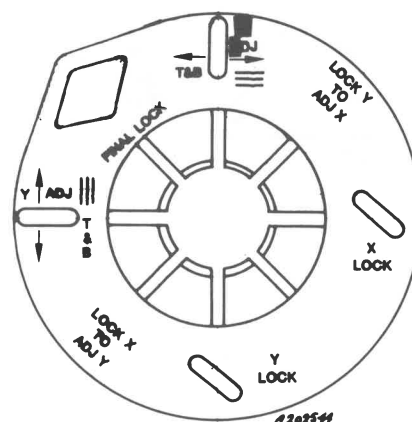


Fig. 14 — Yoke Rear Cover

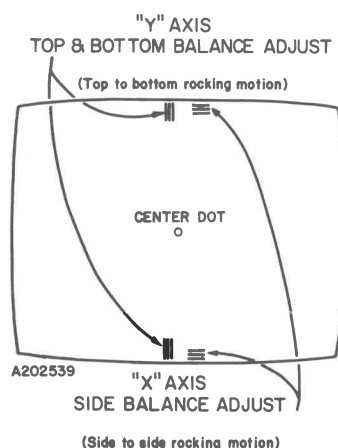


Fig. 15 — Center Dot and Convergence Adjustment

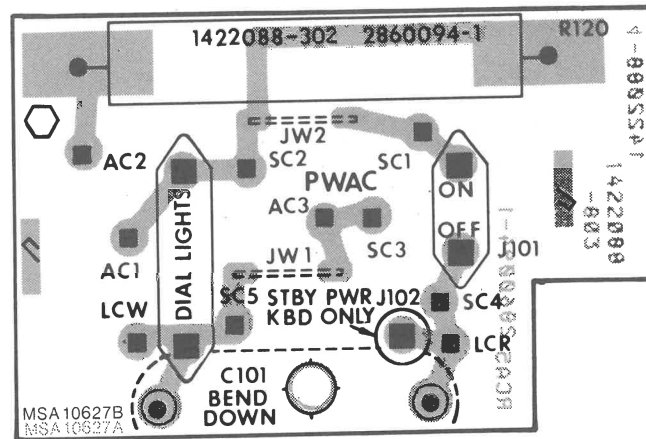


Fig. 16 — PW AC Input Circuit Board

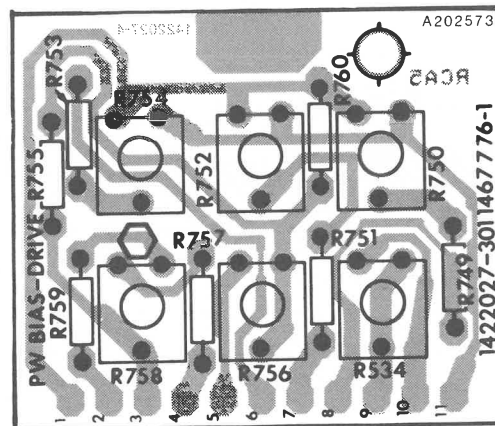


Fig. 17 — PW Bias/Drive Circuit Board

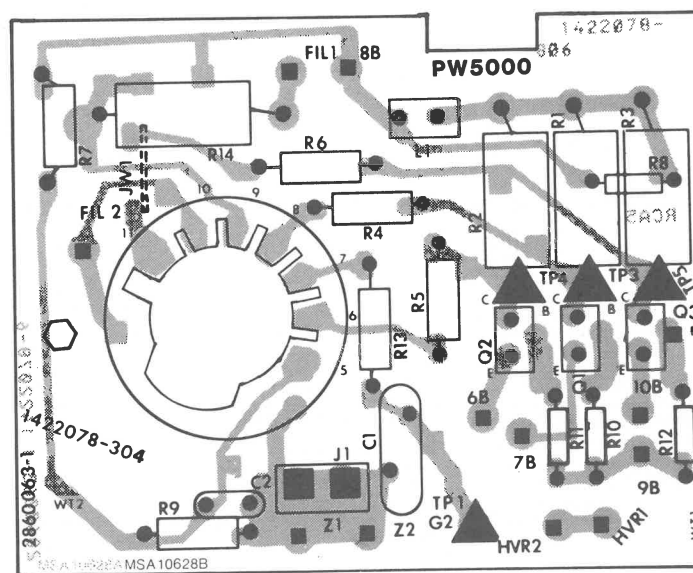


Fig. 18 — PW 5000 Kine Driver/Socket Circuit Board

Note: Stock numbers appear on all modules and major components. The stock number can be identified by a square block on each side of a six digit number. Example: □142708 □

● "HOT" CHASSIS— USE ISOLATION TRANSFORMER.

● WHEN REPLACING THE PICTURE TUBE AND/OR YOKE. REPLACE NON-ADJUSTABLE FERRITE TAPE BEAM BENDER WITH ADJUSTABLE TYPE, STOCK NO.145381.

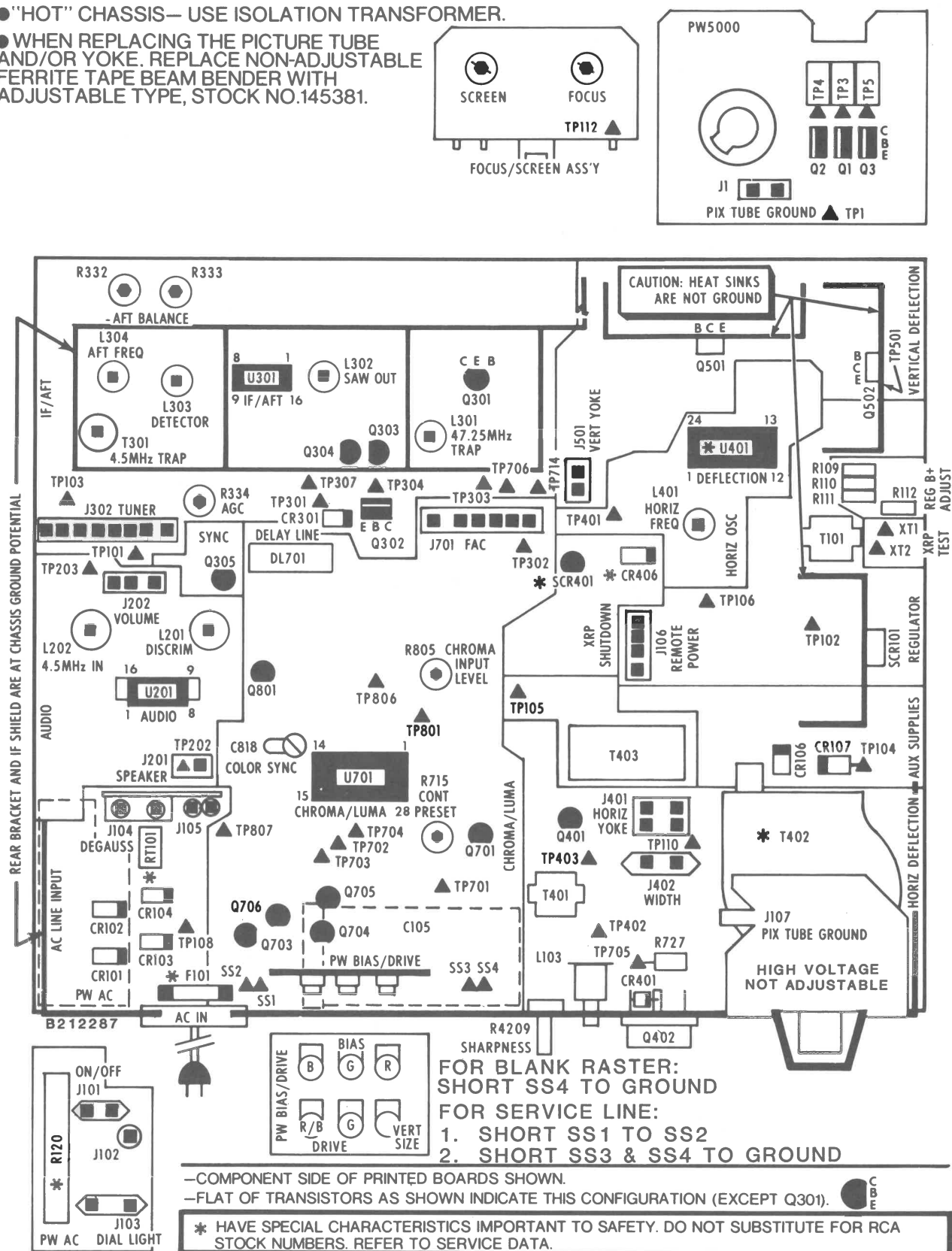
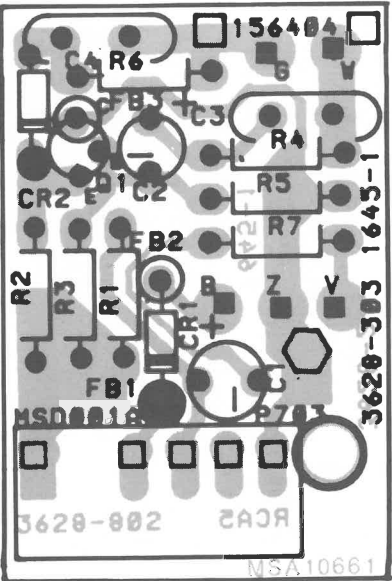


Fig. 19 — Chassis Layout

C102	7A	C414	3G	CR505	1J	Q702	3C	R413	5F	R735	7D	TP703	6D
C103	7B	C415	3F	CR507	1J	Q703	7C	R414	3G	R736	6D	TP704	6D
C104	6B	C416	3H	CR701	5E	Q704	7D	R415	5F	R737	7C	TP705	7F
C106	3H	C417	6F	CR702	4C	Q705	6D	R416	4F	R738	7C	TP706	3E
C107	3H	C418	5F	CR703	3E	Q706	7C	R417	5G	R739	7C	TP714	3F
C108	3H	C419	6F	CR704	5E	Q801	4C	R418	6G	R740	7C	TP801	5D
C109	4G	C420	5E	CR705	4C			R419	4F	R743	6E	TP806	4D
C110	6A	C421	2G	CR706	4C	R101	6A	R420	4F	R744	4D	TP807	6B
C111	3H	C423	6F	CR707	4D	R102	7G	R421	3D	R745	3E		
C113	5J	C426	4H			R103	4G	R422	4F	R746	6E	U201	4B
C115	4H	C427	5F	DL701	3C	R104	4H	R423	6F	R747	6E	U301	1C
C116	4H	C429	3F			R105	3H	R425	3H	R748	6E	U401	2H
C117	3H	C502	2F	FB101	5J	R106	2J	R426	5H	R805	4E	U701	5D
C118	7G	C503	2G	FB102	5H	R107	3J	R427	3H	R806	5D		
C119	4H	C504	1H	FB301	2C	R108	2J	R428	4G	R807	5C	WS101	3A
C120	4F	C505	1H	FB302	2C	R109	2J	R429	4G	R808	6C	WS102	3F
C201	5B	C506	1G	FB303	2E	R110	3J	R430	3G	R809	6C	WS103	2B
C202	5B	C507	1J	FB304	1A	R111	3J	R431	3G	R810	6C	WS104	7E
C203	4A	C508	2G	FB307	2C	R112	3J	R432	4H	R811	5C	WS105	5J
C204	4B	C509	2F	FB308	3A	R113	4H	R434	4J	R812	5C	WS106	7G
C205	5C	C510	1G	FB309	2A	R114	4H	R435	3G	R813	5C		
C206	5B	C511	2G	FB501	2G	R115	5G	R433	5F	R814	6C	WT101	2E
C208	4B	C701	1D			R116	4G	R501	2H	R815	4C		
C209	4C	C702	4D	G103	3E	R117	4G	R502	1G	R818	3E	Y801	5C
C210	5A	C703	6D	G105	6G	R119	5A	R503	1G	R819	3E		
C211	5A	C704	6E	G106	3A	R201	5B	R504	2G	R820	5E		
C212	4B	C705	6E			R202	4B	R505	1G	R821	4C	AC1	6B
C213	4A	C706	6E	J104	6A	R203	4B	R506	2J	R822	5D	AC2	7A
C214	4A	C707	5E	J105	6B	R204	4B	R507	1H	R823	5E	AC3	6A
C301	2E	C708	5C	J106	4G	R205	5A	R508	1H	R824	5E	HB	7F
C302	2E	C709	6C	J201	5B	R206	5A	R509	2F	R825	4C	HC	6G
C303	1E	C710	6D	J202	3A	R301	2F	R511	1G	R827	6C	HE	6F
C304	2D	C711	6D	J302	3A	R302	2E	R512	1G	R829	1D	HVR	7G
C305	1E	C801	4D	J401	6G	R303	2E	R513	1J	R4202	1D	I1	2E
C306	2C	C803	4D	J402	6G	R304	2E	R514	1J	R4203	1F	I2	3A
C307	1C	C805	5E	J501	2F	R305	1F	R515	1J	R4204	1E	I6	2G
C308	2B	C806	5D	J701	3E	R306	1E	R516	2J	R4207	1D	I9	1D
C309	2A	C807	4D	J702	1C	R307	1D	R517	1H	RT101	6B	LCI	3E
C310	2C	C808	4D			R308	1D	R518	2G			M1	4E
C311	2C	C809	5D	L104	5H	R309	2D	R520	3F	SF301	2D	M2	3D
C312	1C	C810	5D	L105	6A	R310	2B	R521	1J			M3	3C
C313	1D	C811	5D	L201	4B	R311	2B	R701	3C	SCR1	4J	M4	3C
C314	3B	C812	4D	L202	4A	R312	1E	R702	6E	SCR2	4H	M5	5A
C315	3B	C813	6B	L301	2D	R313	2C	R703	6D	SCR401	3F	M6	4C
C316	1B	C814	5C	L302	2C	R314	2B	R704	3D			P1	7E
C317	1A	C815	5C	L303	2B	R315	2C	R705	4C	T101	3J	P2	7E
C318	2D	C816	5E	L304	2A	R316	3C	R707	5E	T301	2A	RB	5G
C319	2B	C818	5C	L305	2B	R317	3B	R708	6D	T401	6F	RB2	7B
C320	3B	C819	7B	L307	1C	R318	2C	R709	4C	T402	6J	RB3	7A
C321	4B	C820	6C	L308	2C	R319	2D	R710	4C	T403	5F	RP1	5J
C322	1C	C821	4C	L309	2E	R320	2C	R711	4C			RP2	5J
C323	3C	C822	4C	L310	2E	R321	3B	R712	4D	TP101	3B	SS1	7C
C324	3C	C823	5E	L311	2B	R322	3C	R713	3E	TP102	4H	SS2	7C
C325	1C			L312	1C	R323	3B	R714	1E	TP103	3A	SS3	7E
C326	3C	CR101	7A	L313	1C	R325	3D	R715	6E	TP104	5J	SS4	7E
C327	1B	CR102	7A	L314	2B	R326	1B	R716	5C	TP105	5E	XT1	3J
C328	2C	CR103	7B	L401	3G	R327	1B	R717	1D	TP106	4G	XT2	3J
C329	2C	CR104	6B	L402	7F	R328	4C	R718	3E	TP108	7B	2A	4C
C330	4B	CR105	4G	L701	6D	R330	1B	R719	7E	TP110	6G	3A	1F
C331	2D	CR106	5H	L702	6D	R331	2E	R720	7E	TP202	5B	4A	1F
C333	1B	CR107	5J	L801	4E	R332	1A	R721	7E	TP203	3A	5A	2J
C334	2A	CR301	3C	L803	6C	R333	1B	R722	6C	TP301	3C	6A	7D
C335	3C	CR302	3B	L804	5C	R334	3B	R723	7C	TP302	3F	7A	7D
C401	3F	CR402	2H	L805	6C	R335	2B	R724	7C	TP303	2E	8A	4H
C402	2H	CR405	3G	L806	4C	R401	2G	R725	5E	TP304	3D	9A	7D
C403	2H	CR406	3G			R402	4J	R726	7E	TP307	2C	10A	7D
C404	2H	CR407	4F	Q301	2E	R403	2H	R727	7G	TP401	3F	11A	7D
C405	2H	CR408	2H	Q303	2D	R404	2H	R728	6E	TP402	7F	1B	5G
C406	3G	CR409	3F	Q304	2D	R405	3F	R729	6C	TP405	3A	3B	7D
C407	4F	CR410	5J	Q305	3C	R406	5H	R730	6C	TP406	6F	5B	5A
C408	2G	CR501	1G	Q401	6F	R407	3G	R731	6C	TP501	2J	8B	3A
C410	6F	CR502	1G	Q502	2J	R408	2H	R732	6D	TP701	6E	11B	3C
C411	4F	CR503	1H	Q501	1H	R411	3G	R733	6D	TP702	6C	8C	4H
C412	3F	CR504	1J	Q701	6E	R412	4G	R734	6D				



MSD001 on Screen Display

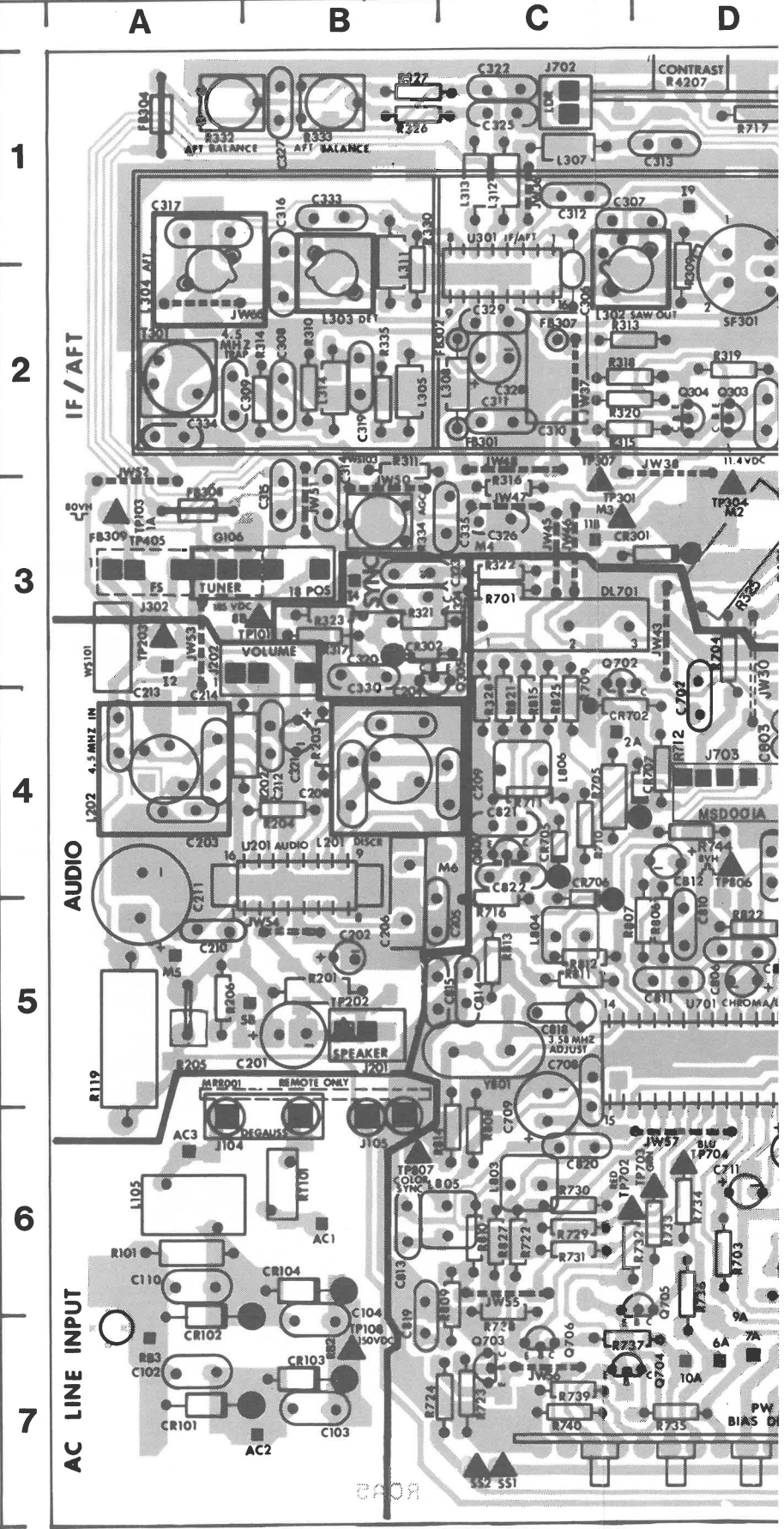


Fig. 20 — M

- TP703 6D

TP704 6D

TP705 7F

TP706 3E

TP714 3F

TP801 5D

TP806 4D

TP807 6B
- U201 4B

U301 1C

U401 2H

U701 5D
- WS101 3A

WS102 3F

WS103 2B

WS104 7E

WS105 5J

WS106 7G
- WT101 2E

Y801 5C
- AC1 6B

AC2 7A

AC3 6A

HB 7F

HC 6G

HE 6F

HVR 7G

I1 2E

I2 3A

I6 2G

I9 1D

LCI 3E

M1 4E

M2 3D

M3 3C

M4 3C

M5 5A

M6 4C

P1 7E

P2 7E

RB 5G

RB2 7B

RB3 7A

RP1 5J

RP2 5J

SS1 7C

SS2 7C

SS3 7E

SS4 7E

XT2 3J

2A 4C

3A 1F

4A 1F

5A 2J

6A 7D

7A 7D

8A 4H

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3B 7D

4B 7D

5B 5A

8B 3A

11B 3C

8C 4H

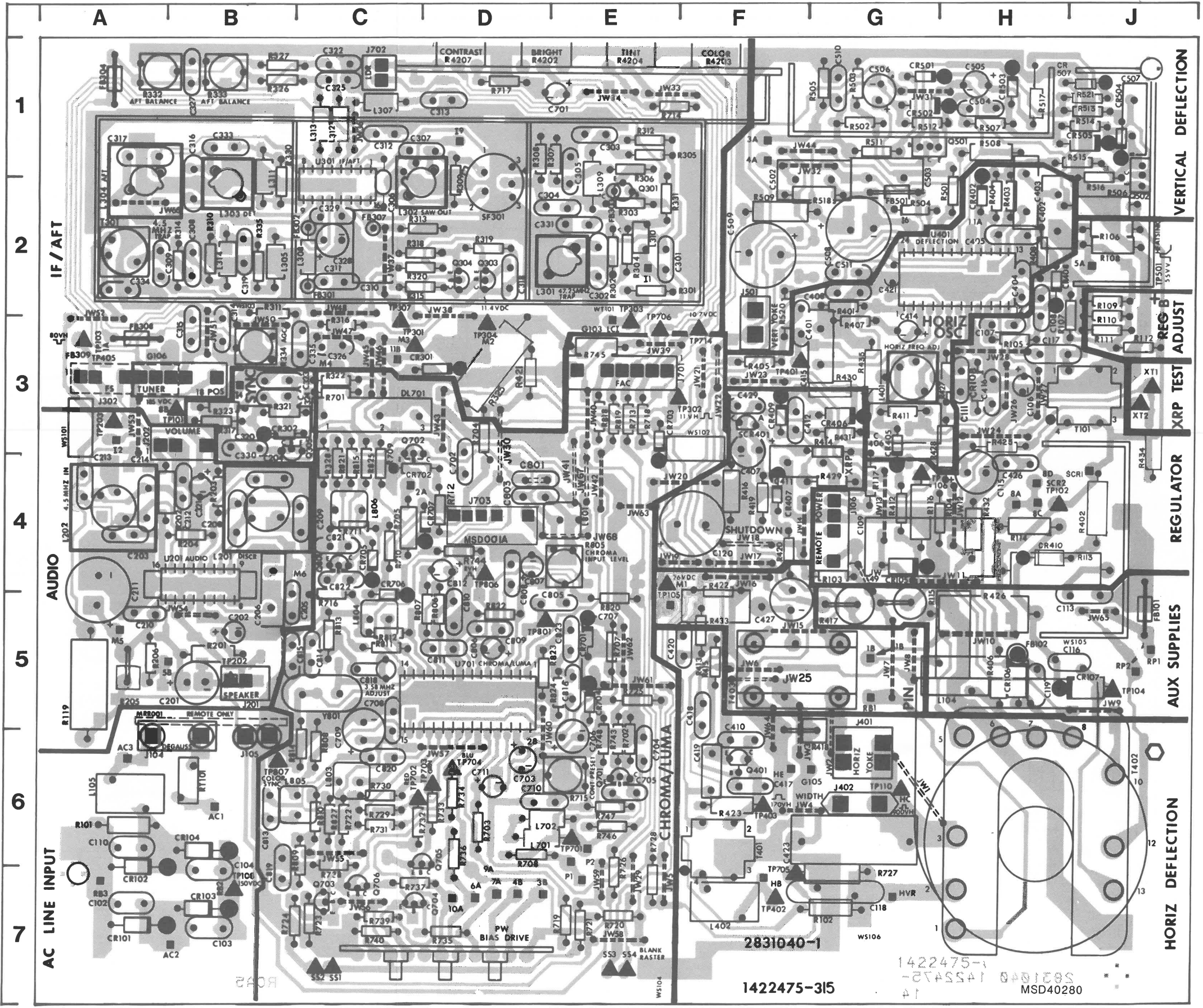
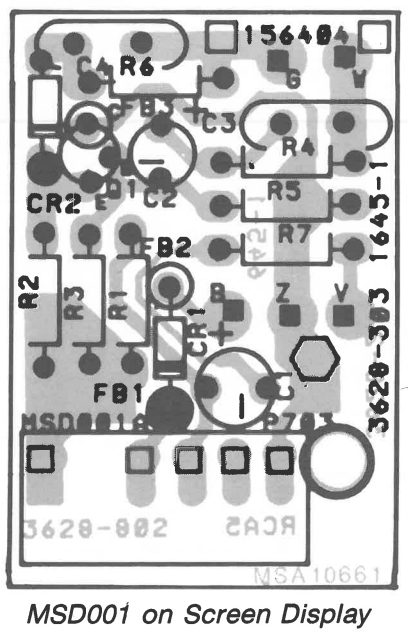


Fig. 20 — Main Chassis Circuit Board Assembly

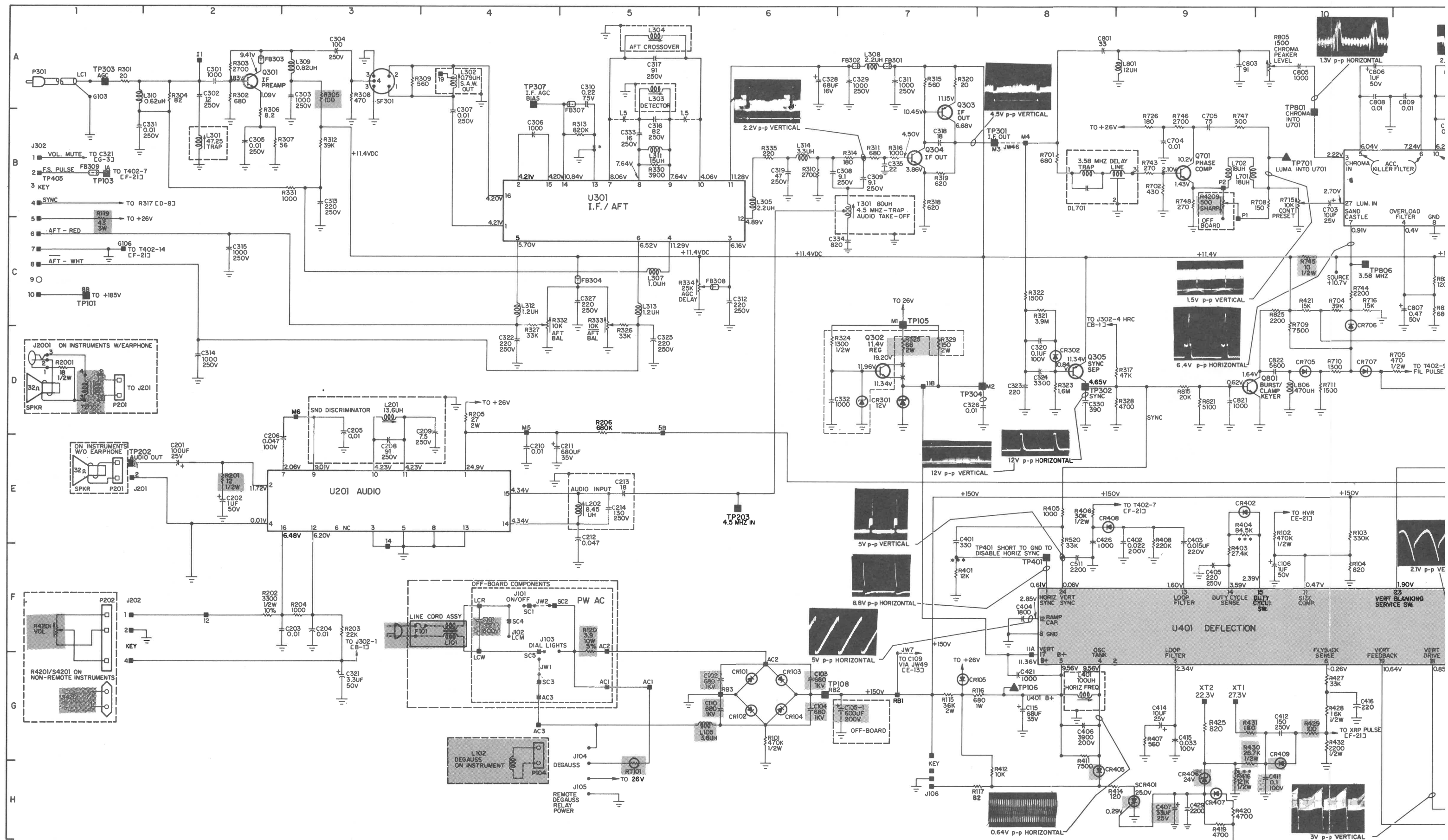


Fig. 21 — CTC 120 Circuit Schematic

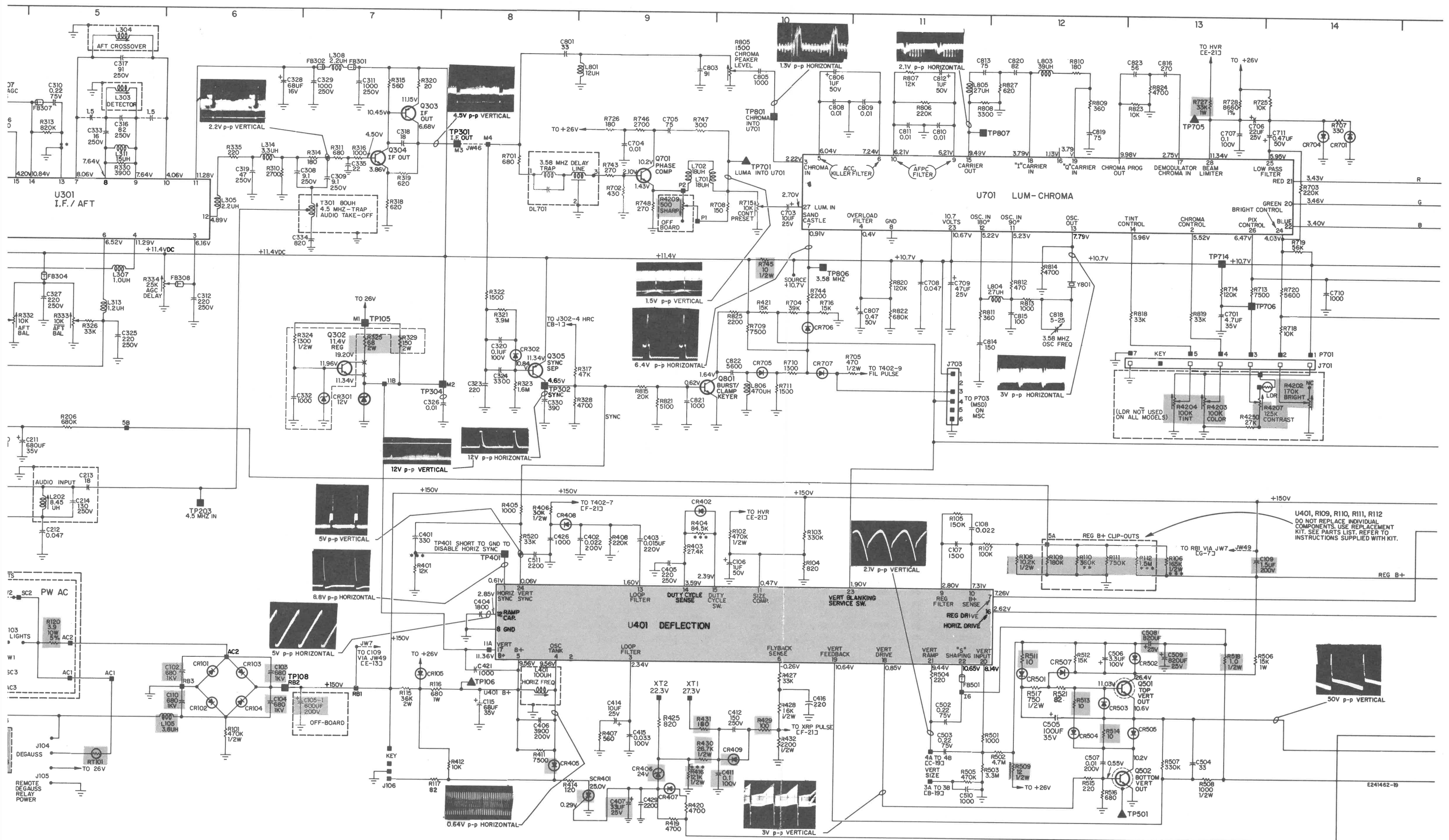
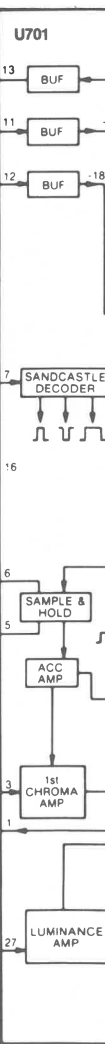


Fig. 21 — CTC 120 Circuit Schematic



28

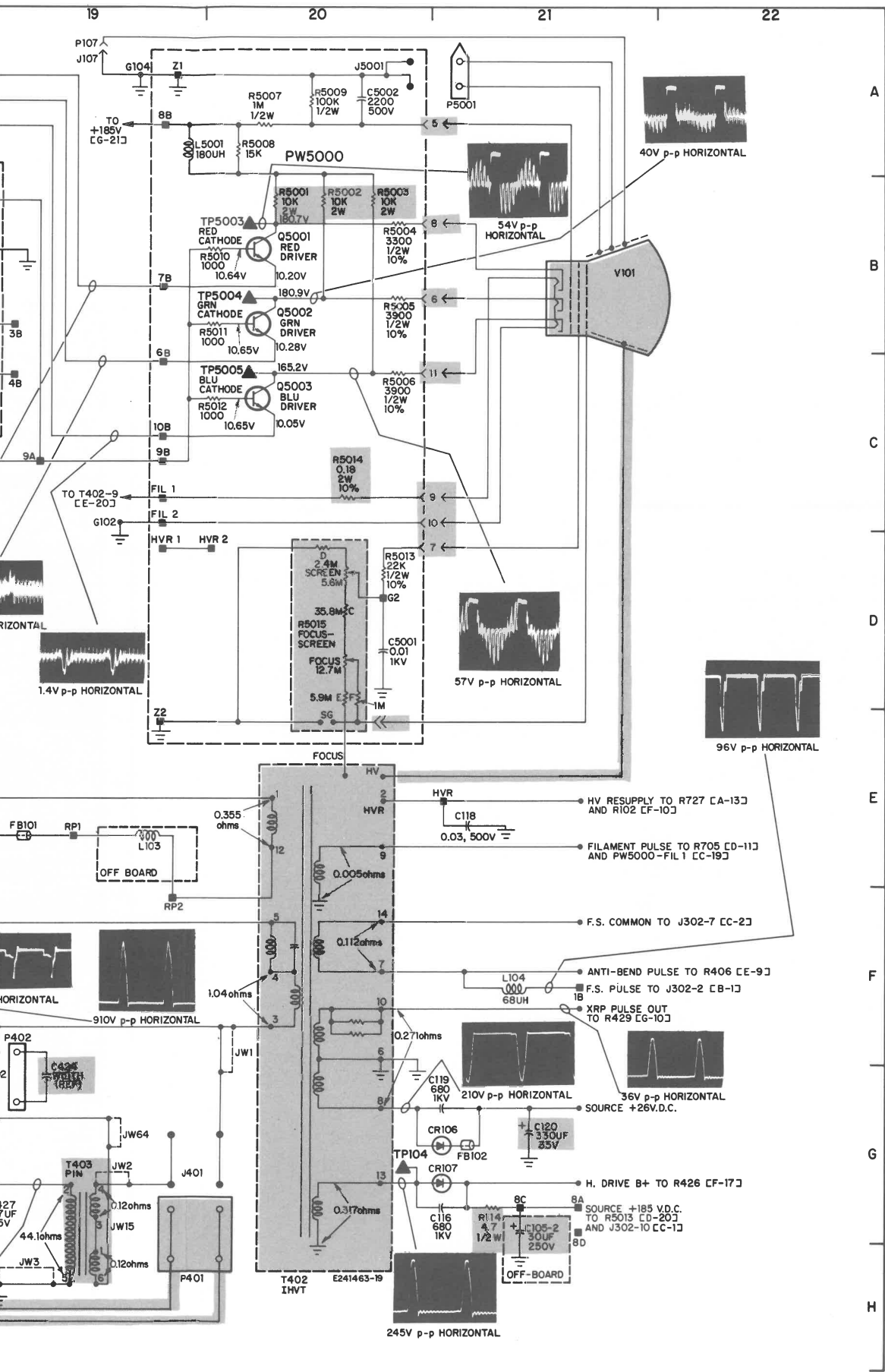


Fig. 22 — CTC 120 Circuit Schematic

- NOTES:
1. THE ARROW BY A VARIABLE RESISTOR INDICATES DIRECTION OF CLOCKWISE ROTATION.
 2. ALL CAPACITORS ARE 50V. EXCEPT WHERE INDICATED.
 3. ALL RESISTORS ARE 1/4W 5%. EXCEPT WHERE INDICATED.
 4. CAPACITANCE VALUES 1.0 AND ABOVE ARE IN PF. CAPACITANCE VALUES BELOW 1.0 ARE IN UF. EXCEPT WHERE INDICATED.
 5. RESISTANCE VALUES ARE IN OHMS. K= X 1000.
 6. ** INDICATES 2% TOLERANCE.
 7. *** INDICATES 1% TOLERANCE.
 8. A) ■ INDICATES SERVICE TP WITH STAKE.
B) ▲ INDICATES SERVICE TP ON A COMPONENT LEAD.
 9. "OFF AIR" SIGNAL USED FOR WAVEFORMS IN I-F AND INCLUDING TP701. CHROMA BAR COLOR GENERATOR USED FOR ALL OTHER WAVEFORMS.
 10. ALL DC VOLTAGES ARE POSITIVE EXCEPT WHERE NOTED.
 11. BLOCK DIAGRAMS FOR U201, U301, U401 AND U701 ARE ON PAGE 40.

All integrated circuits and many other semiconductors are electrostatically sensitive and therefore require the special handling techniques described under "Electrostatically Sensitive (ES) Devices" in the Servicing Precautions section of this service data.

PRODUCT SAFETY & X-RADIATION WARNING
SHADED COMPONENTS HAVE SPECIAL CHARACTERISTICS IMPORTANT TO SAFETY OR X-RADIATION PROTECTION. BEFORE REPLACING ANY OF THESE COMPONENTS, READ CAREFULLY THE PRODUCT SAFETY NOTICES AND SPECIFIED REPLACEMENT PARTS IN THIS SERVICE DATA. DO NOT DEGRADE THE SAFETY OF THE SET THROUGH IMPROPER SERVICING. NOMINAL 2ND ANODE VOLTAGE IS 25.0KV AT MAXIMUM BRIGHTNESS AND CONTRAST. MAXIMUM 2ND ANODE VOLTAGE IS 32.0KV AT ANY BRIGHTNESS AND CONTRAST SETTING. THIS INSTRUMENT CONTAINS NO HIGH VOLTAGE ADJUSTMENT. SEE TEXT FOR OTHER SERVICE ADJUSTMENTS.

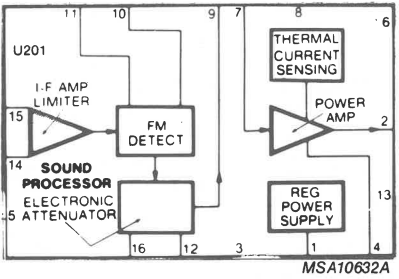


Fig. 23a — U201 Sound

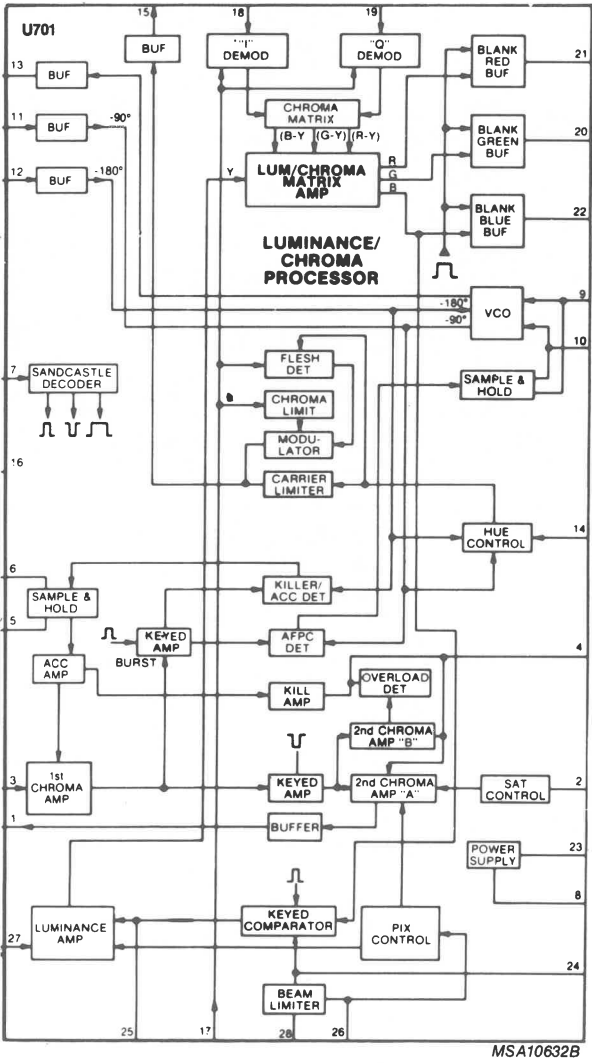


Fig. 23c — U701 Luma/Chroma

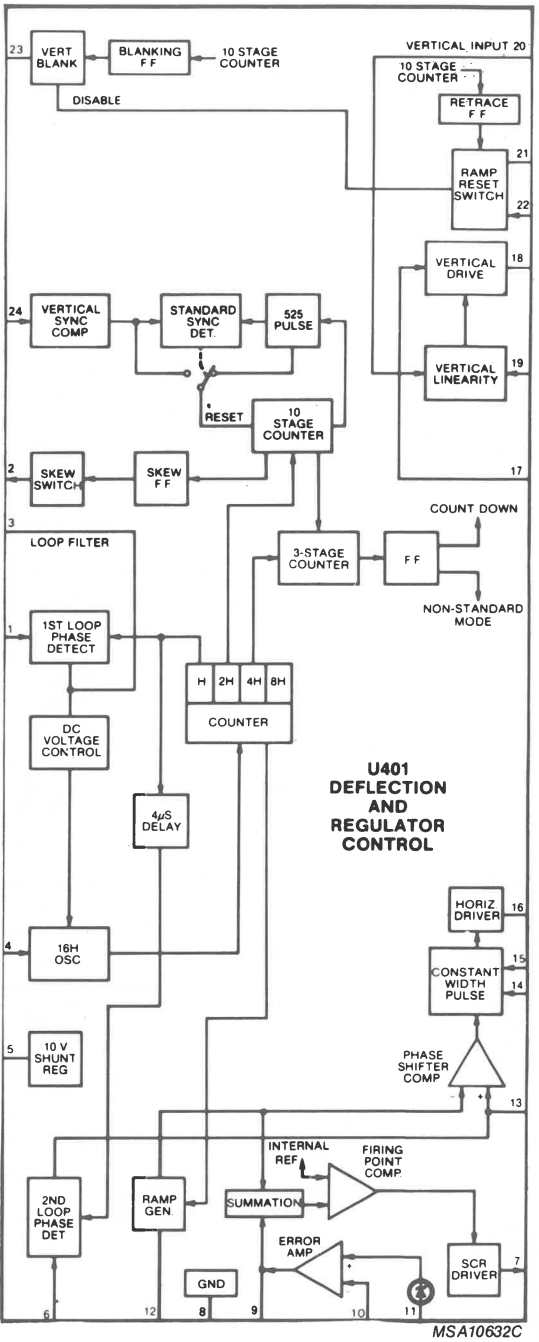


Fig. 23b — U401 Deflection

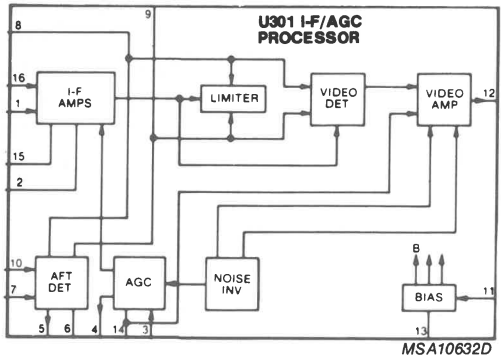


Fig. 23d — U301 IF/AGC

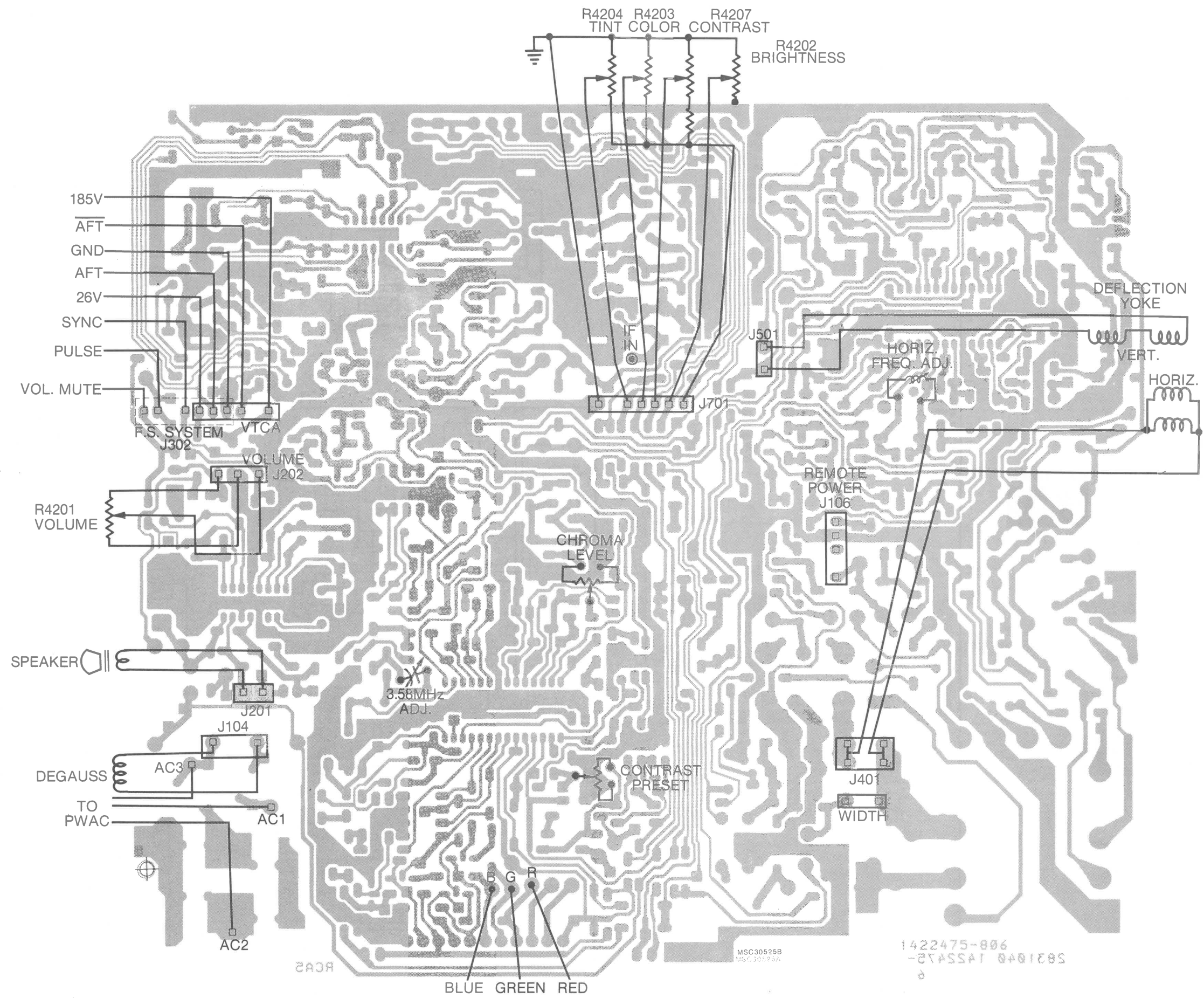
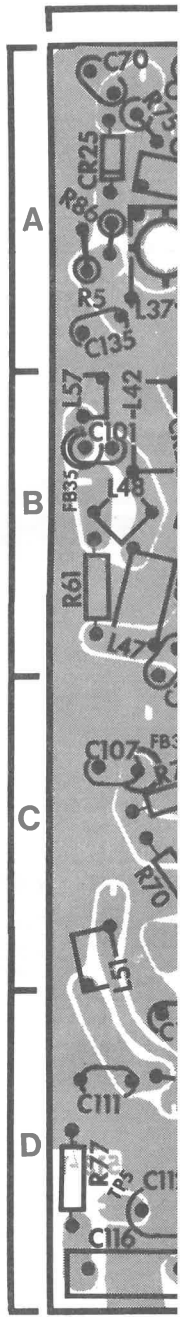
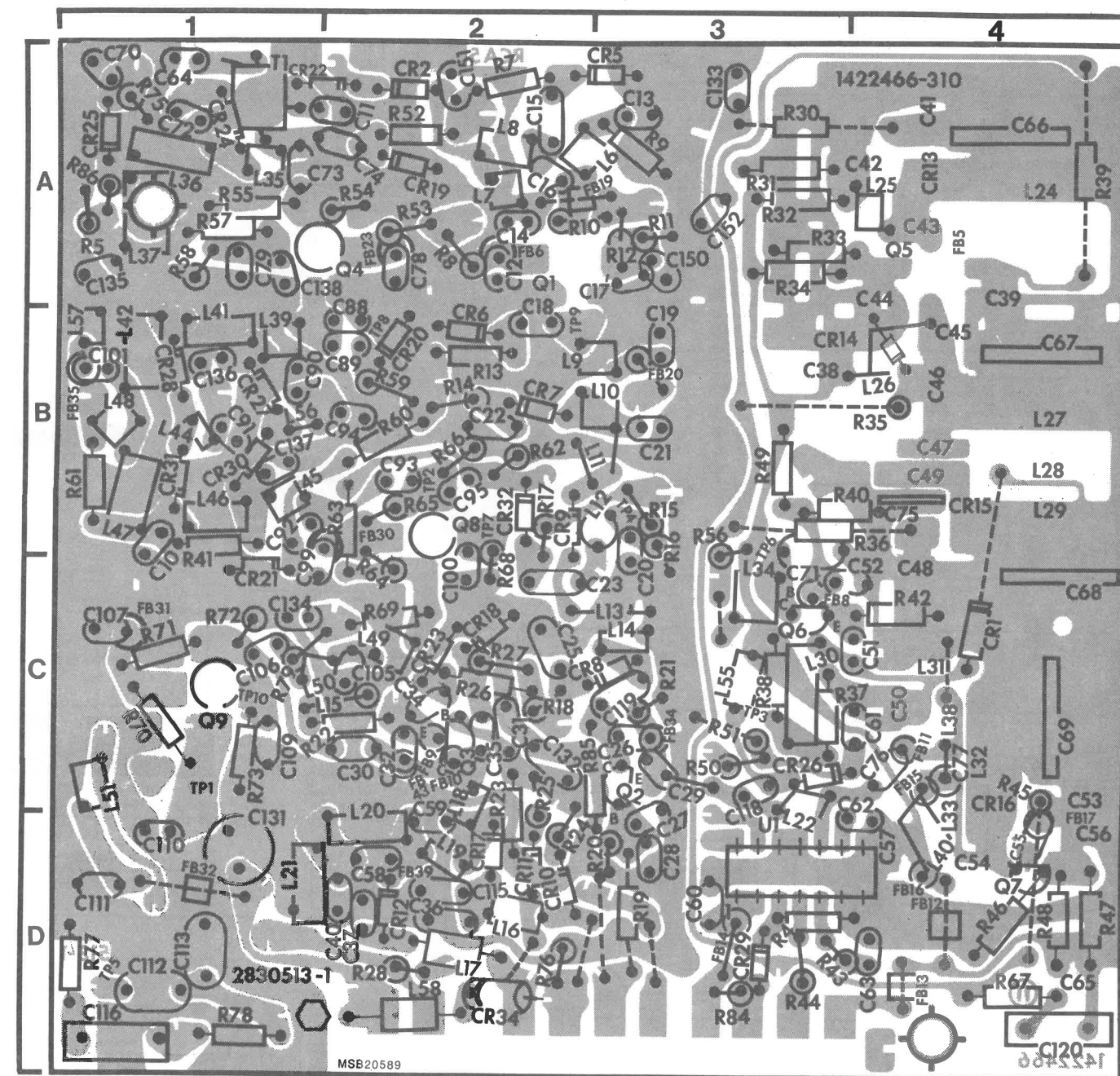
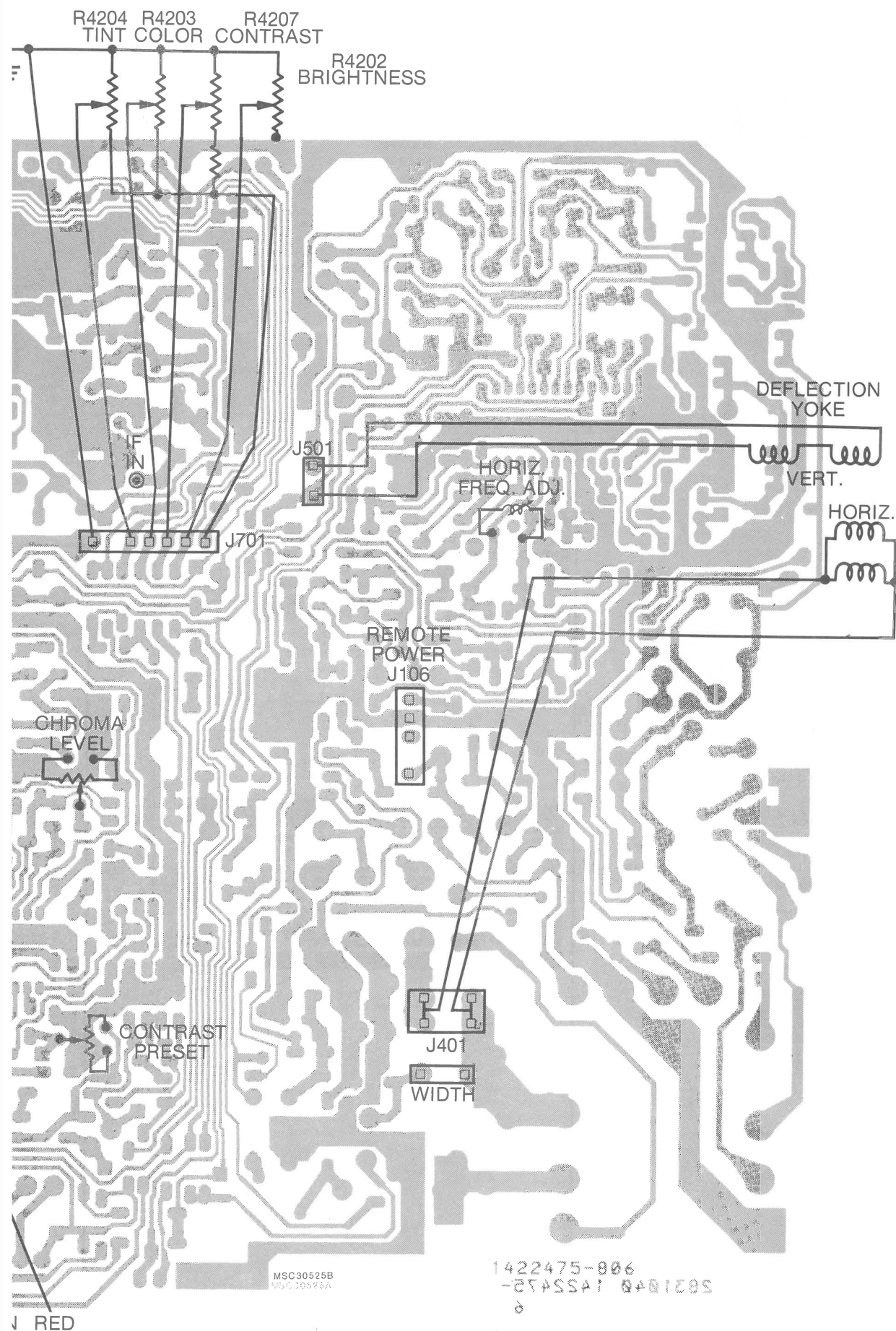


Fig. 24 — External Wiring Interconnect





NOTE: Add 2400 Series Prefix To Item Numbers

Fig. 25 — MST 007RA/013RB Multiband Tuner - PW 24000 Circuit Board

STAR or SHADIN
See PRODUCT S/
on page 2 of this

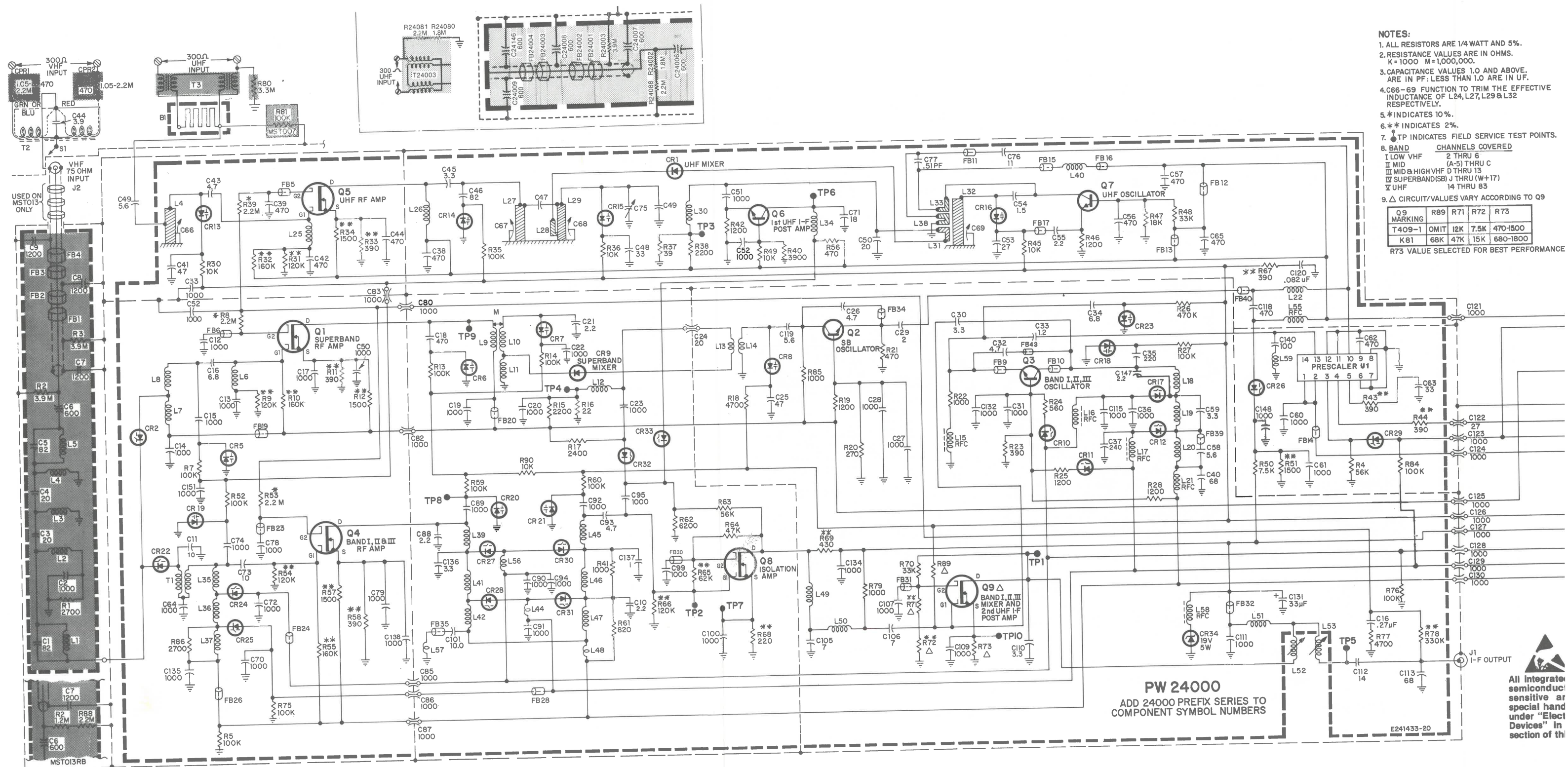
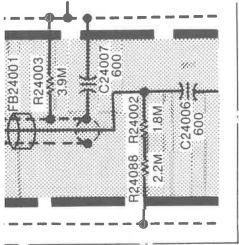


Fig. 26 — MST 007RA Multiband Tuner Schematic

All integrated
semiconductors
sensitive or
special hand
under "Elect
Devices" in
section of thi



STAR or SHADING (*)
See PRODUCT SAFETY NOTICE
on page 2 of this Service Data.

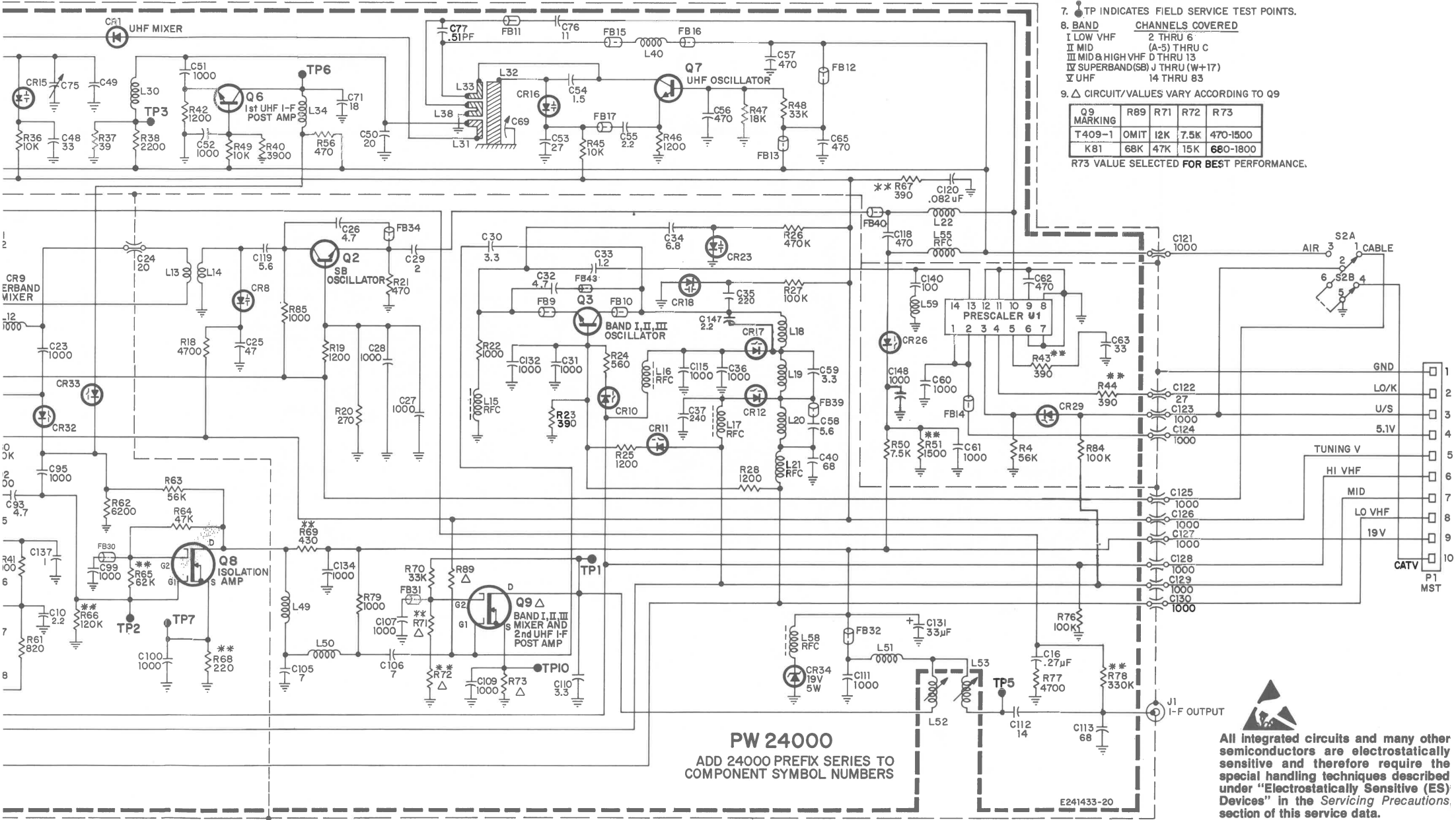
VOLTAGE CHART*
BAND

STAGE	ELEMENT	I	II	III	IV	V
Q1	D	—	—	—	18.5	—
	G2	10.3	10.3	10.3	10.3	10.3
	G1	—	—	—	7.8	—
	S	—	—	—	7.8	—
Q2	C	—	—	—	12.5	—
	B	—	—	—	3.3	—
	E	—	—	—	3.0	—
Q3	C	18.7	17.8	17.7	—	—
	B	4.4	6.7	8.8	—	—
	E	5.6	7.7	8.8	—	—
Q4	D	18.6	17.7	17.7	—	—
	G2	10.3	10.3	10.3	10.3	10.3
	G1	7.9	7.5	7.5	—	—
Q5	D	—	—	—	—	18.6
	G2	10.3	10.3	10.3	10.3	10.3
	G1	—	—	—	—	7.9
Q6	C	—	—	—	—	15.8
	B	—	—	—	—	5.1
	E	—	—	—	—	4.4
Q7	C	—	—	—	—	18.6
	B	—	—	—	—	5.2
	E	—	—	—	—	5.8
Q8	D	11.3	11.3	11.3	11.3	11.3
	G2	9.0	9.0	9.0	9.0	9.0
	G1	5.9	5.9	5.9	5.9	5.9
	S	5.3	5.3	5.3	5.3	5.3
Q9	D	18.6	18.5	18.5	18.6	18.5
	G2	13.9	13.9	13.8	13.8	13.9
	G1	6.6	6.7	6.6	6.6	6.6
	S	7.7	7.8	7.5	7.1	7.1
CR1	A	—	—	—	—	0.3
	K	—	—	—	—	—
CR9	A	—	—	—	0.2	—
	K	—	—	—	—	—

*All voltages are + DC.

NOTES:

1. ALL RESISTORS ARE 1/4 WATT AND 5%.
 2. RESISTANCE VALUES ARE IN OHMS.
K=1000 M=1,000,000.
 3. CAPACITANCE VALUES 1.0 AND ABOVE.
ARE IN PF; LESS THAN 1.0 ARE IN UF.
 4. C66-69 FUNCTION TO TRIM THE EFFECTIVE
INDUCTANCE OF L24, L27, L29 & L32
RESPECTIVELY.
 5. * INDICATES 10%.
 6. ** INDICATES 2%.
 7. TP INDICATES FIELD SERVICE TEST POINTS.
 8. BAND CHANNELS COVERED
I LOW VHF 2 THRU 6
II MID (A-5) THRU C
III MID & HIGH VHF D THRU I3
IV SUPERBAND(SB) J THRU (W+17)
V UHF 14 THRU 83
 9. Δ CIRCUIT/VALUES VARY ACCORDING TO Q9
- | Q9 MARKING | R89 | R71 | R72 | R73 |
|------------|------|-----|------|----------|
| T409-1 | OMIT | 12K | 7.5K | 470-1500 |
| K81 | 68K | 47K | 15K | 680-1800 |
- R73 VALUE SELECTED FOR BEST PERFORMANCE.



STAR or SHADING (★) See PRODUCT SAFETY NOTICE on page 2 of this Service Data.

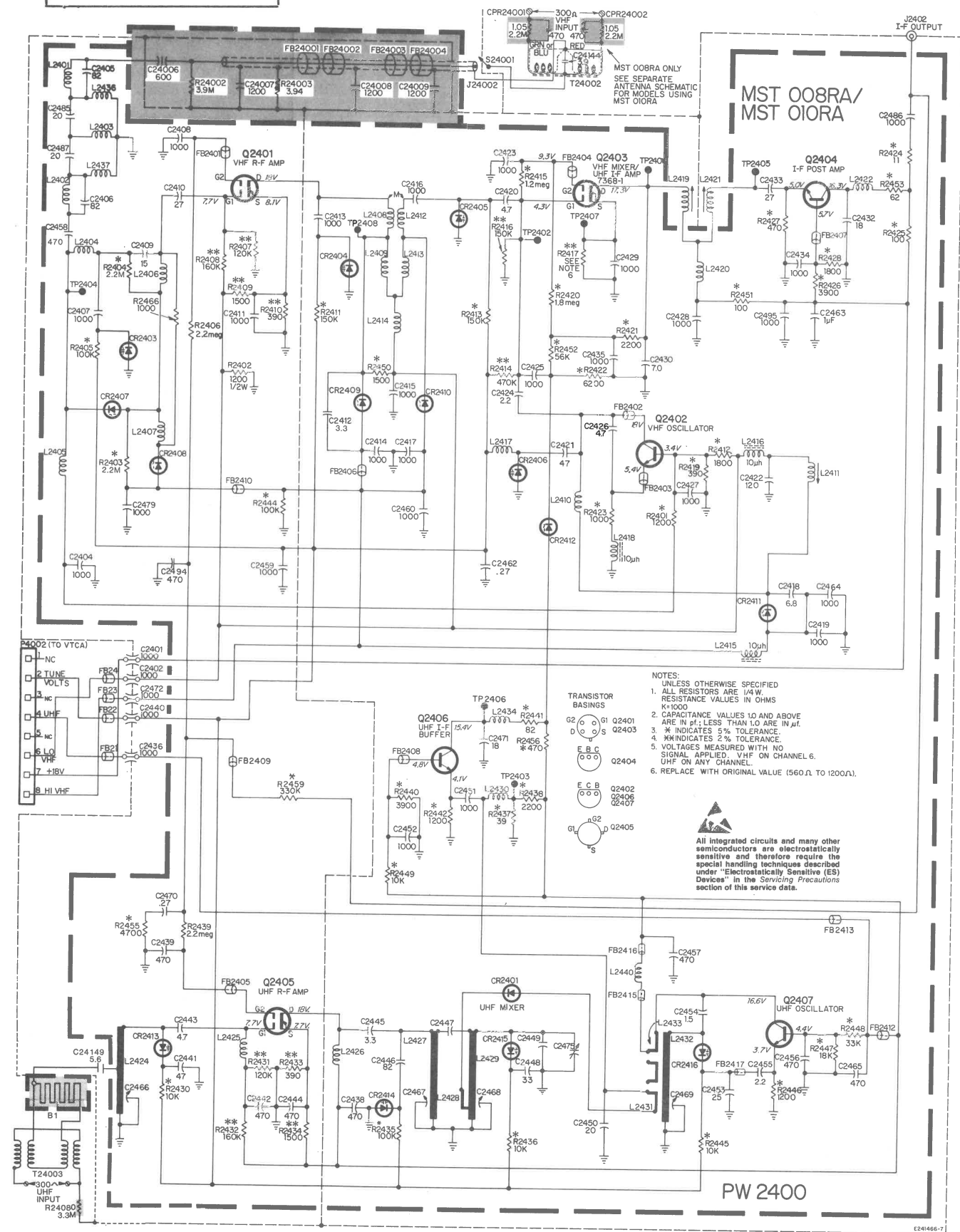
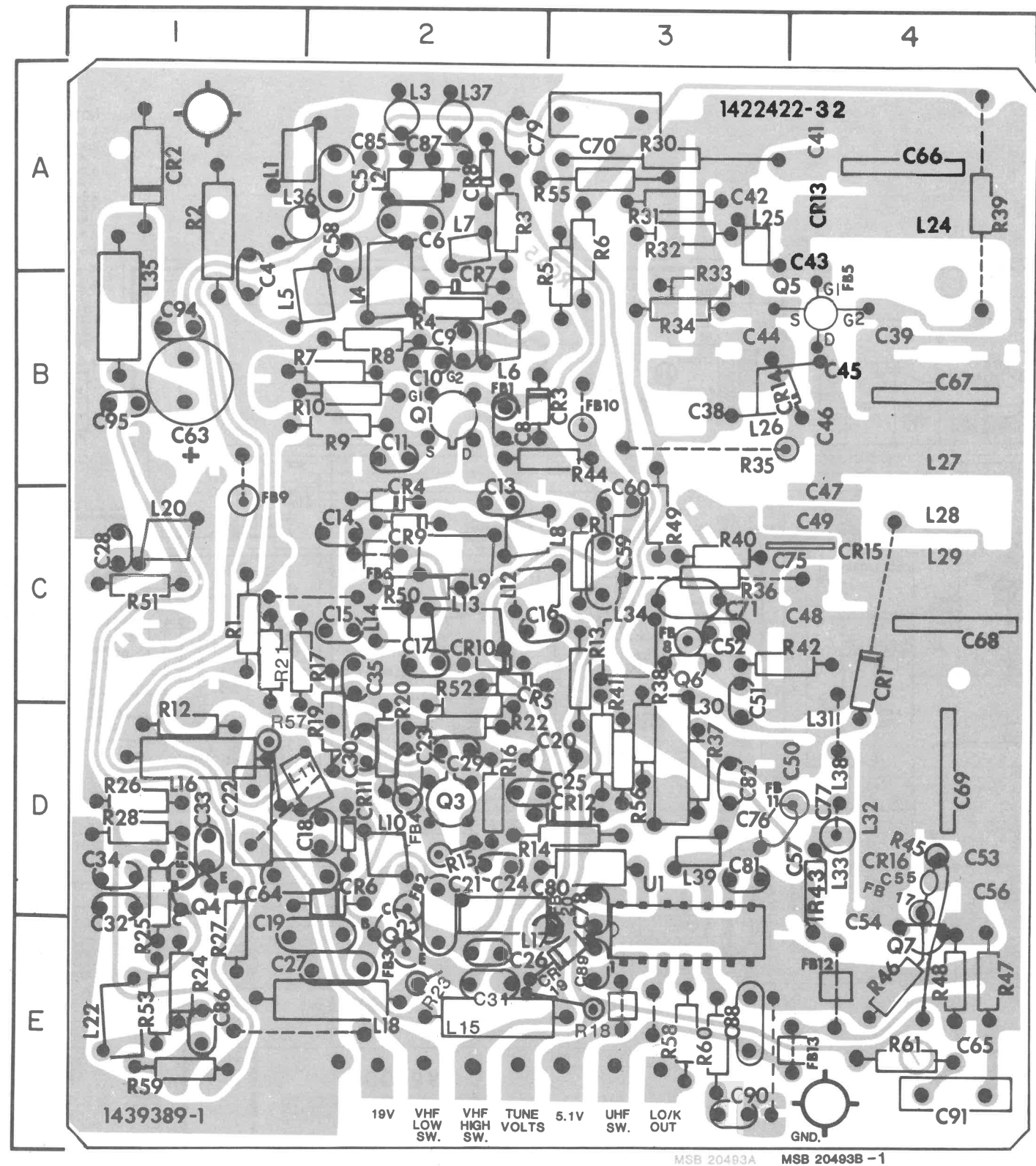


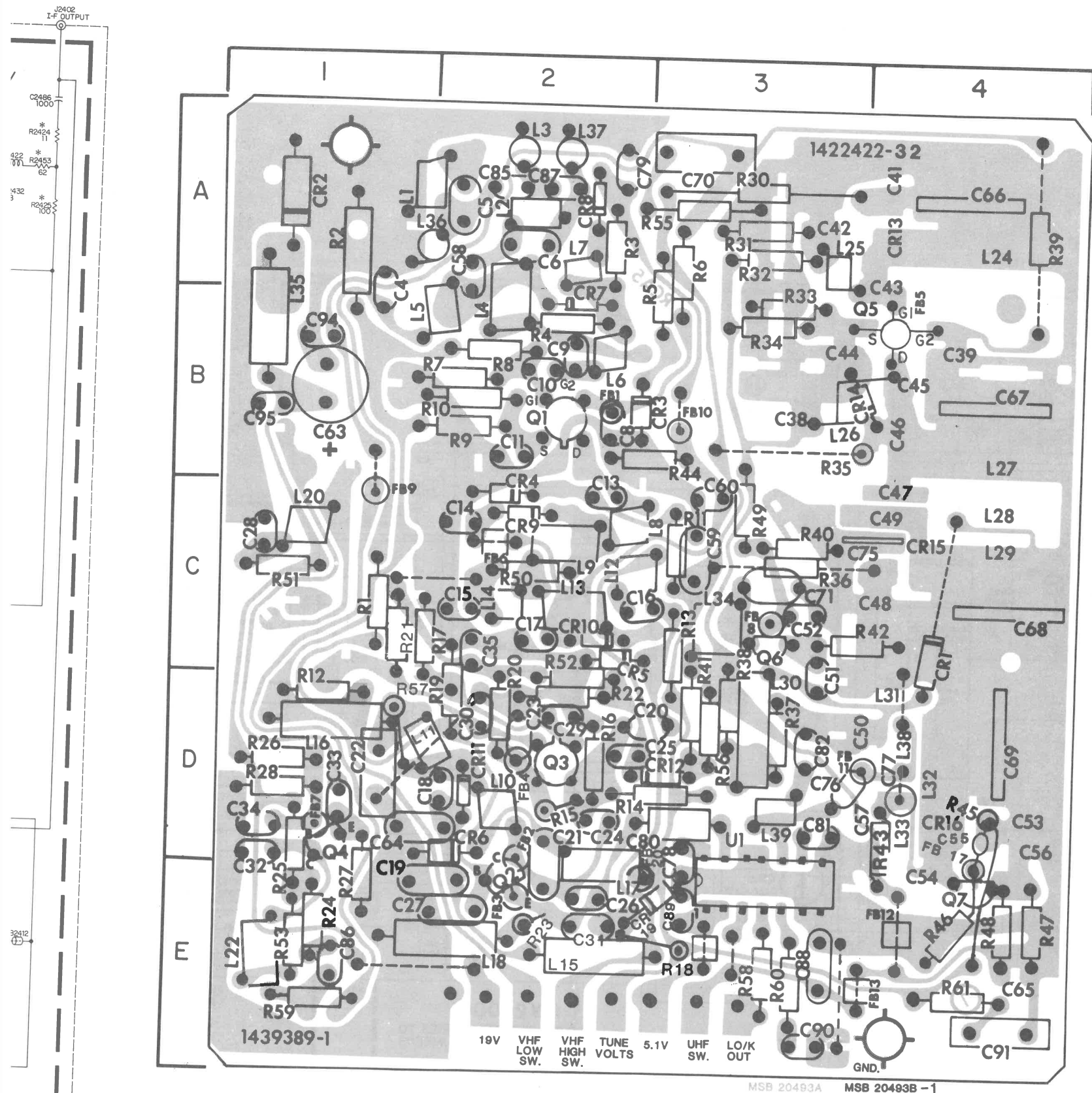
Fig. 27 — VHF/UHF — MST 008RA Tuner Module Schematic

STAR or SI See PRODUCT SAFETY NOTICE on page 2 of this Service Data.



Note: Add 2400 Series Prefix To Item Numbers

Fig. 28 — PW 2400 (MST 008/017) Tuner Module Circuit Board



Note: Add 2400 Series Prefix To Item Numbers

Fig. 28 — PW 2400 (MST 008/017) Tuner Module Circuit Board

STAR or SHADING (*)
See PRODUCT SAFETY NOTICE
on page 2 of this Service Data.

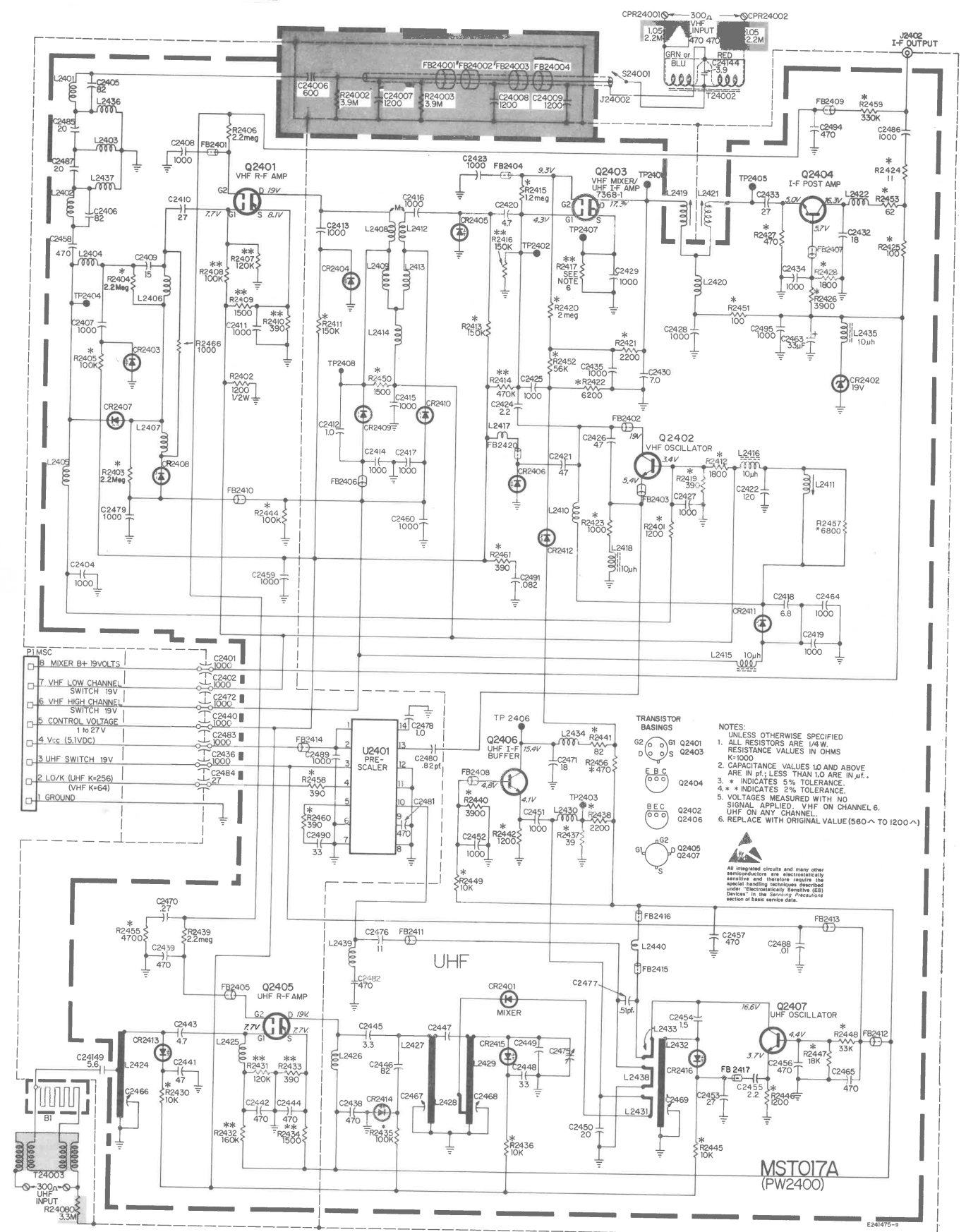


Fig. 29 — MST 017A Frequency Synthesis Tuner Module Schematic

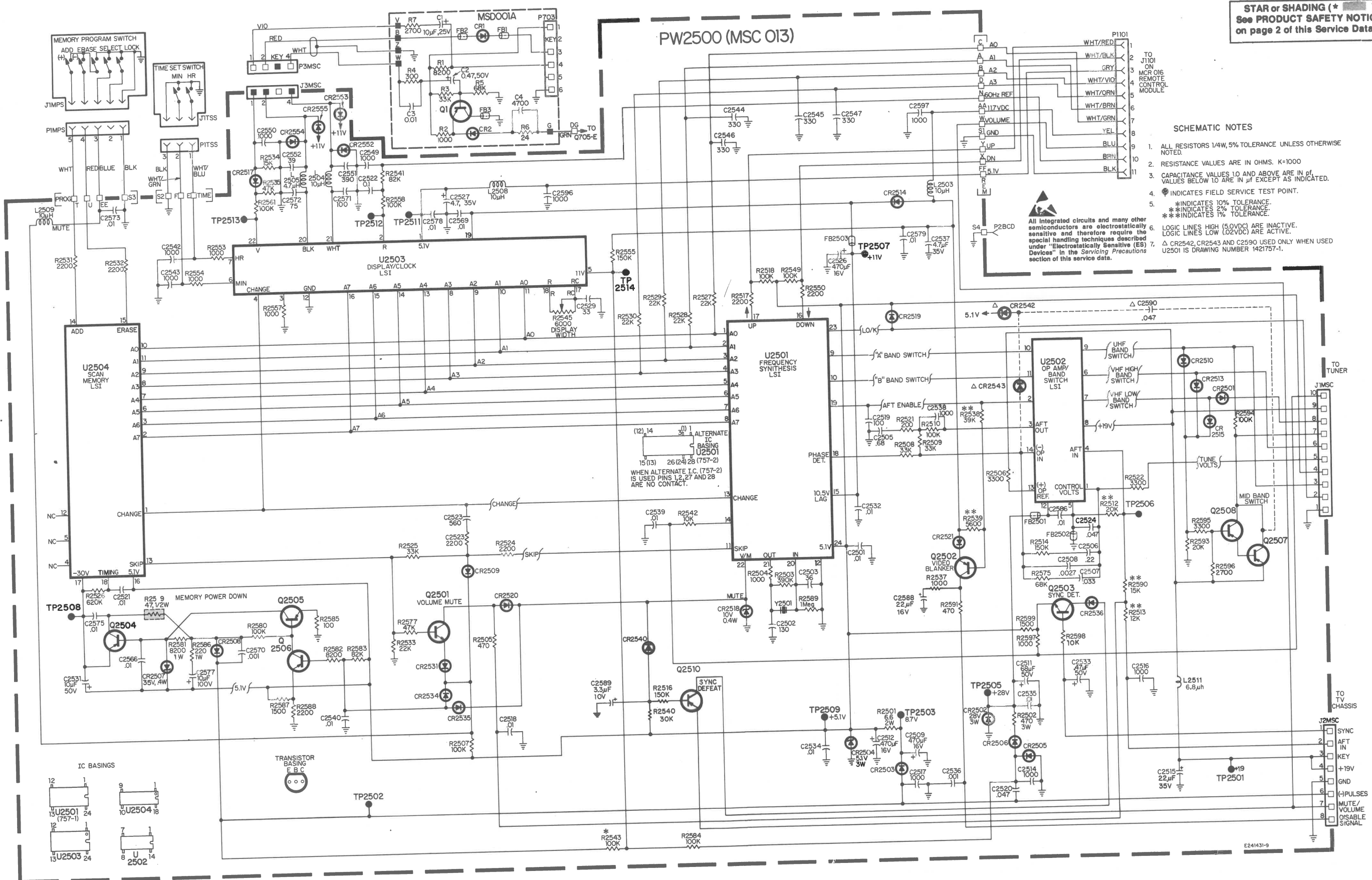


Fig. 30 MSC013RA Frequency Synthesis Tuner Control Schematic Diagram

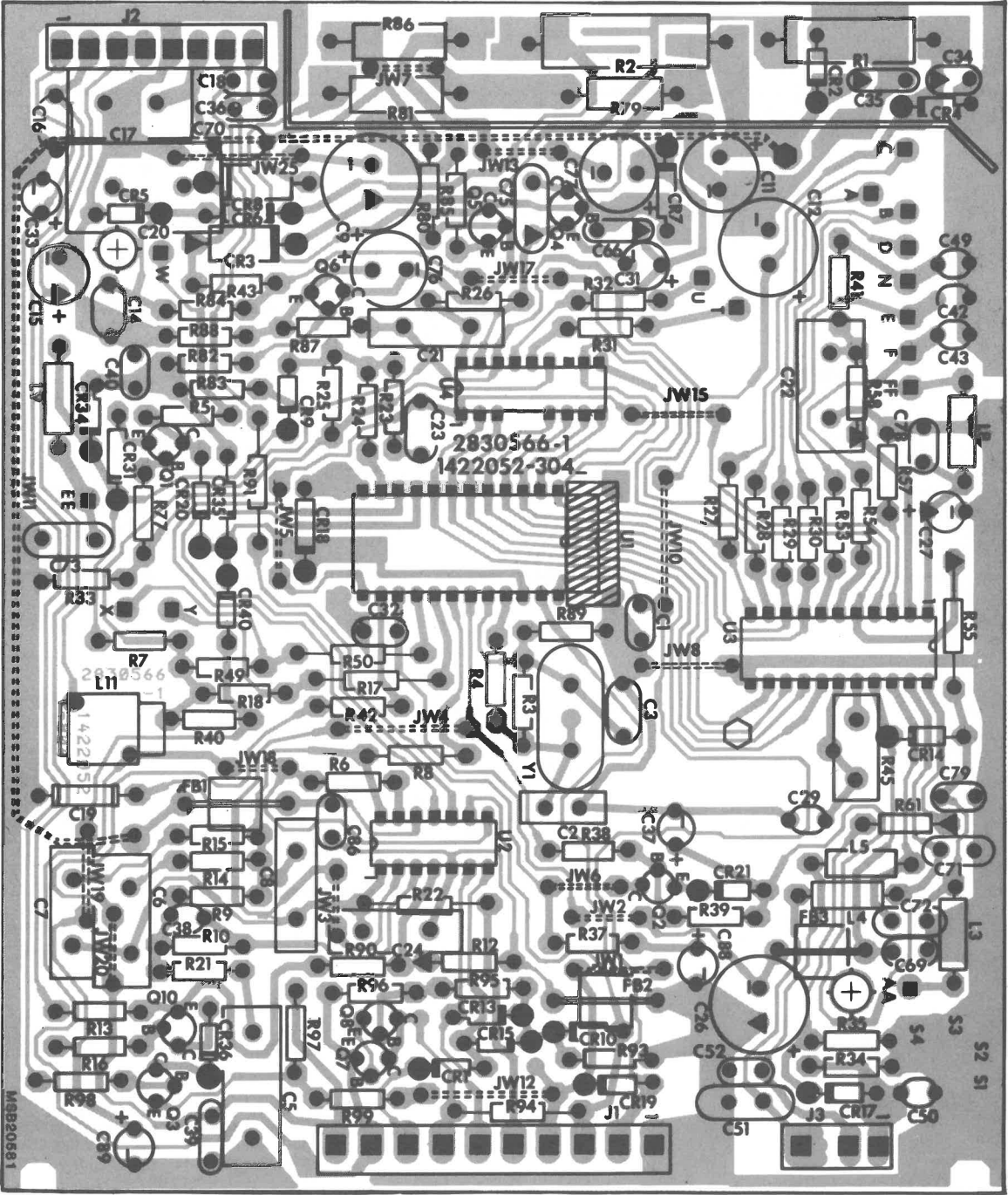
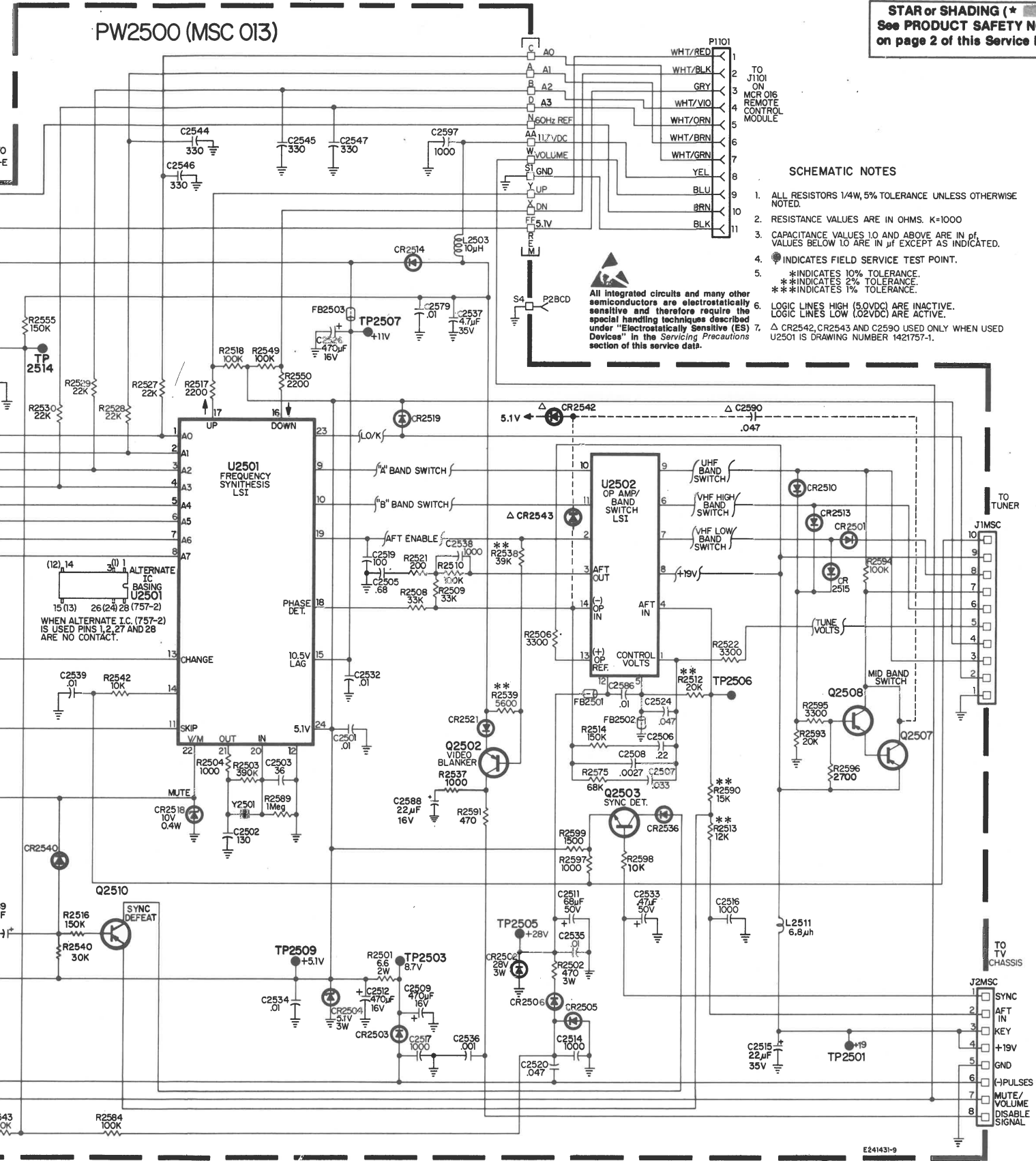
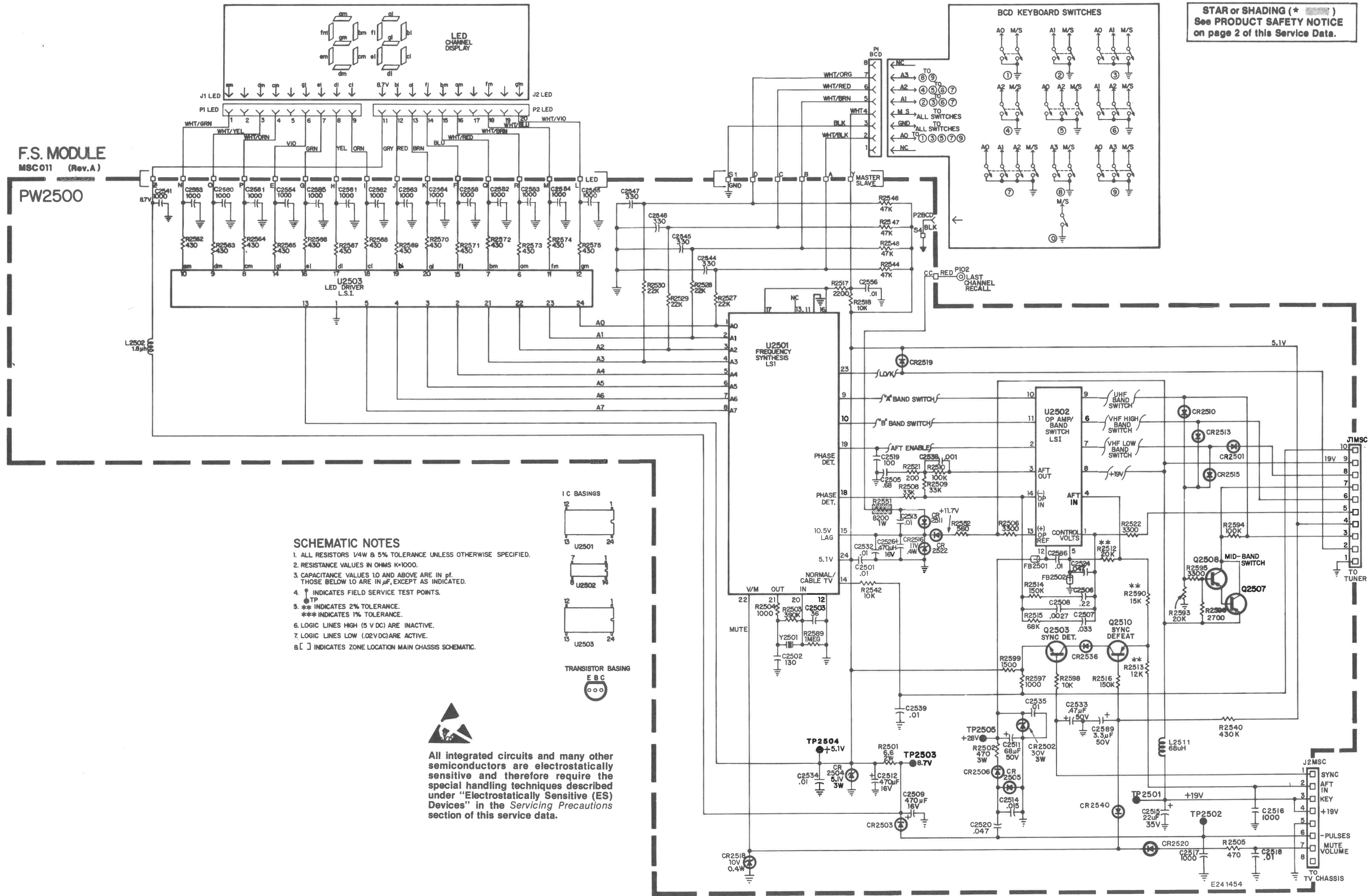


Fig. 31 — PW2500 Frequency Synthesis Tuner (MSC013RA) Circuit Board Assembly

RA Frequency Synthesis Tuner Control Schematic Diagram



FREQUENCY SYNTHESIS TUNER CONTROL MODULES

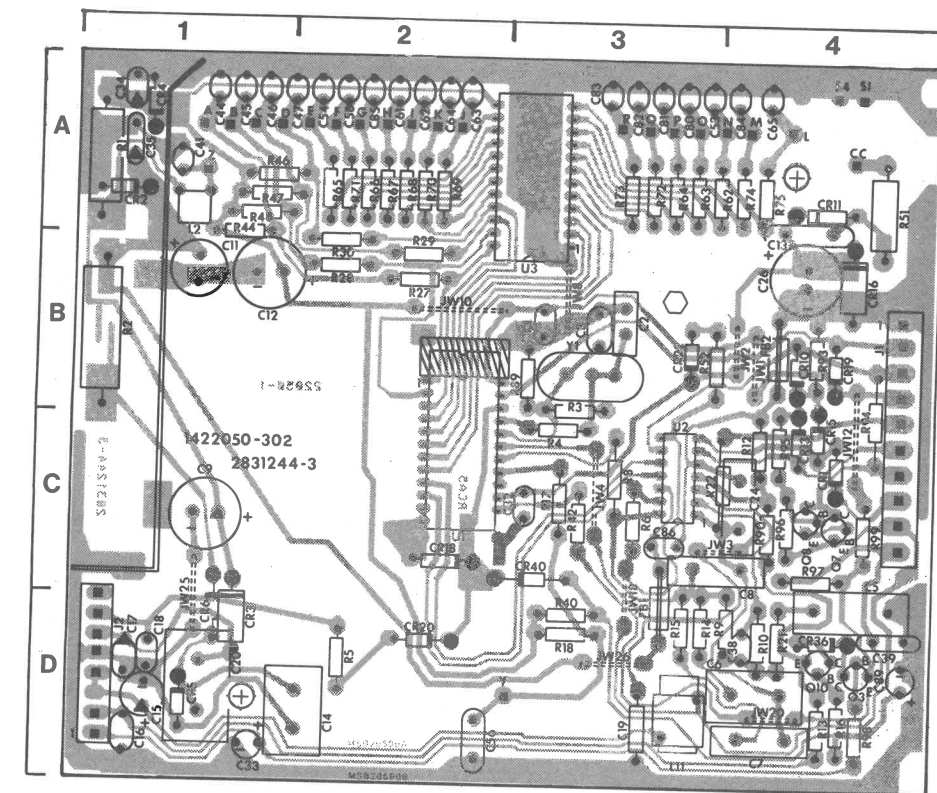
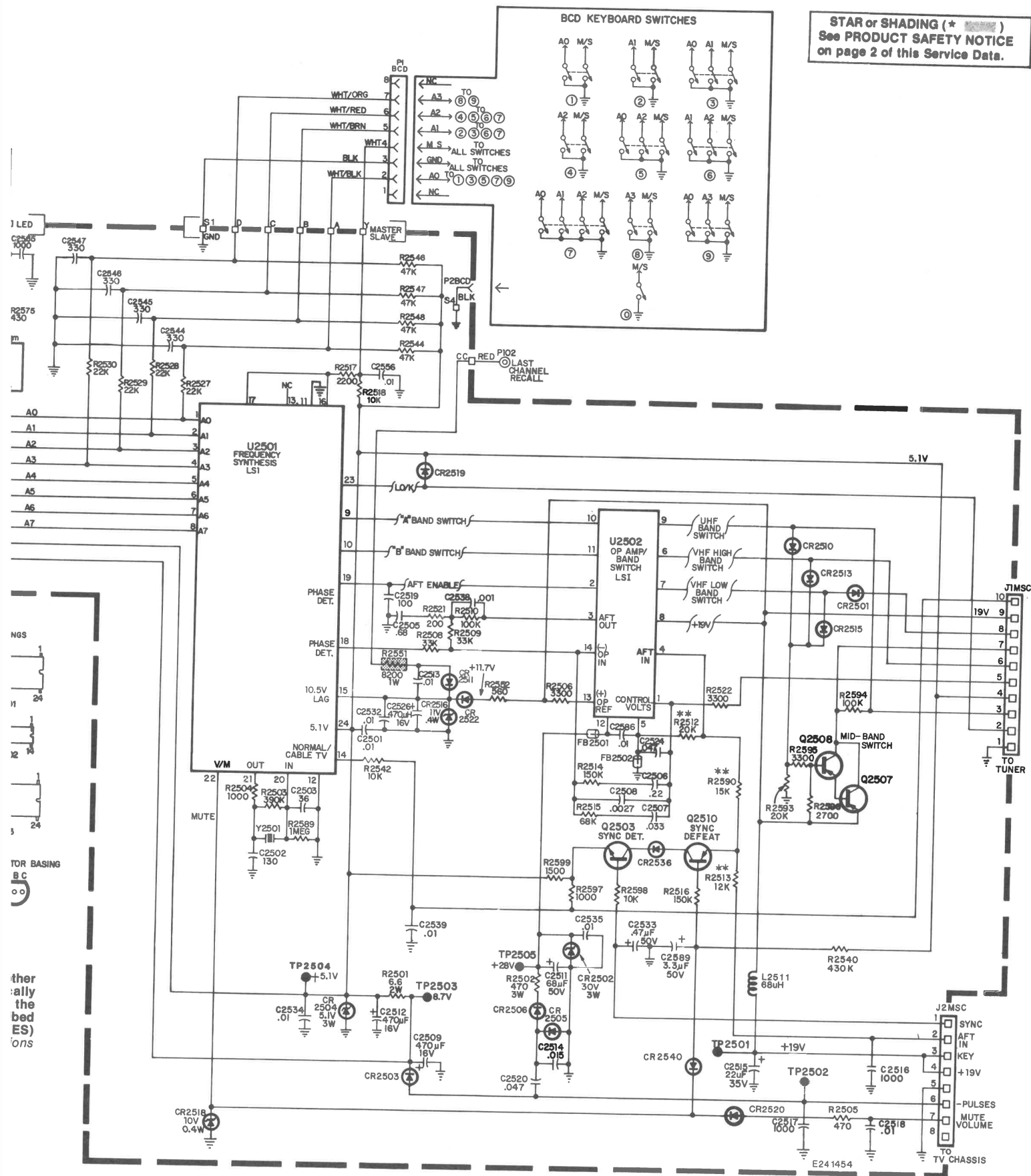


Fig. 33 — MSC 011RA Tuner Control Module Circuit Board

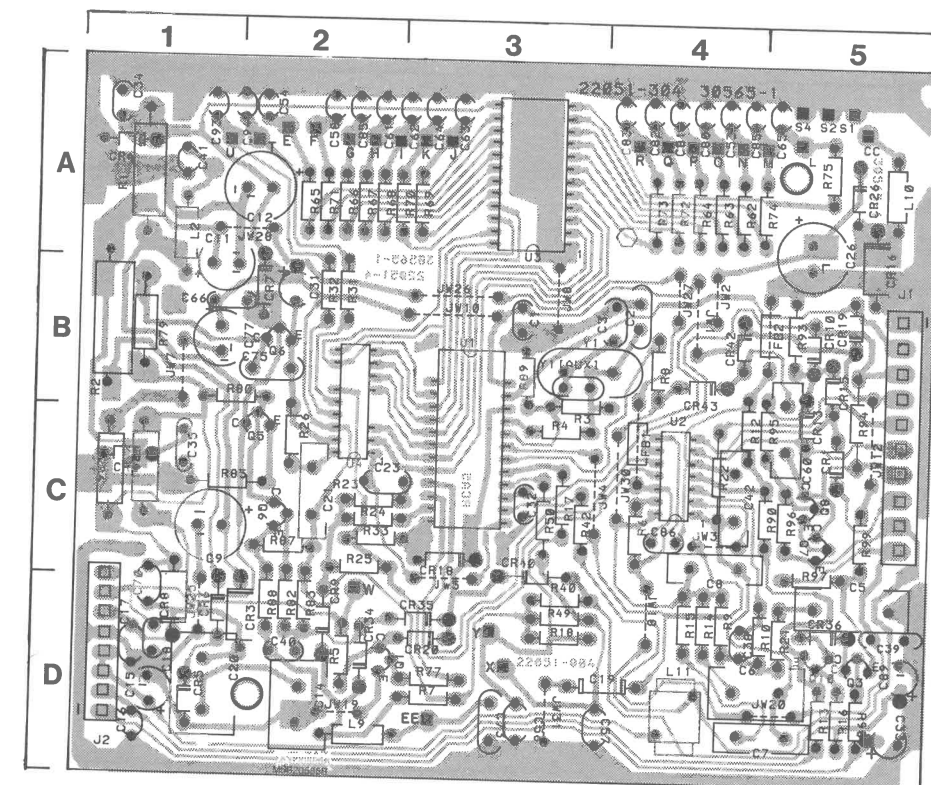


Fig. 34 — MSC 012RA Tuner Control Module Circuit Board

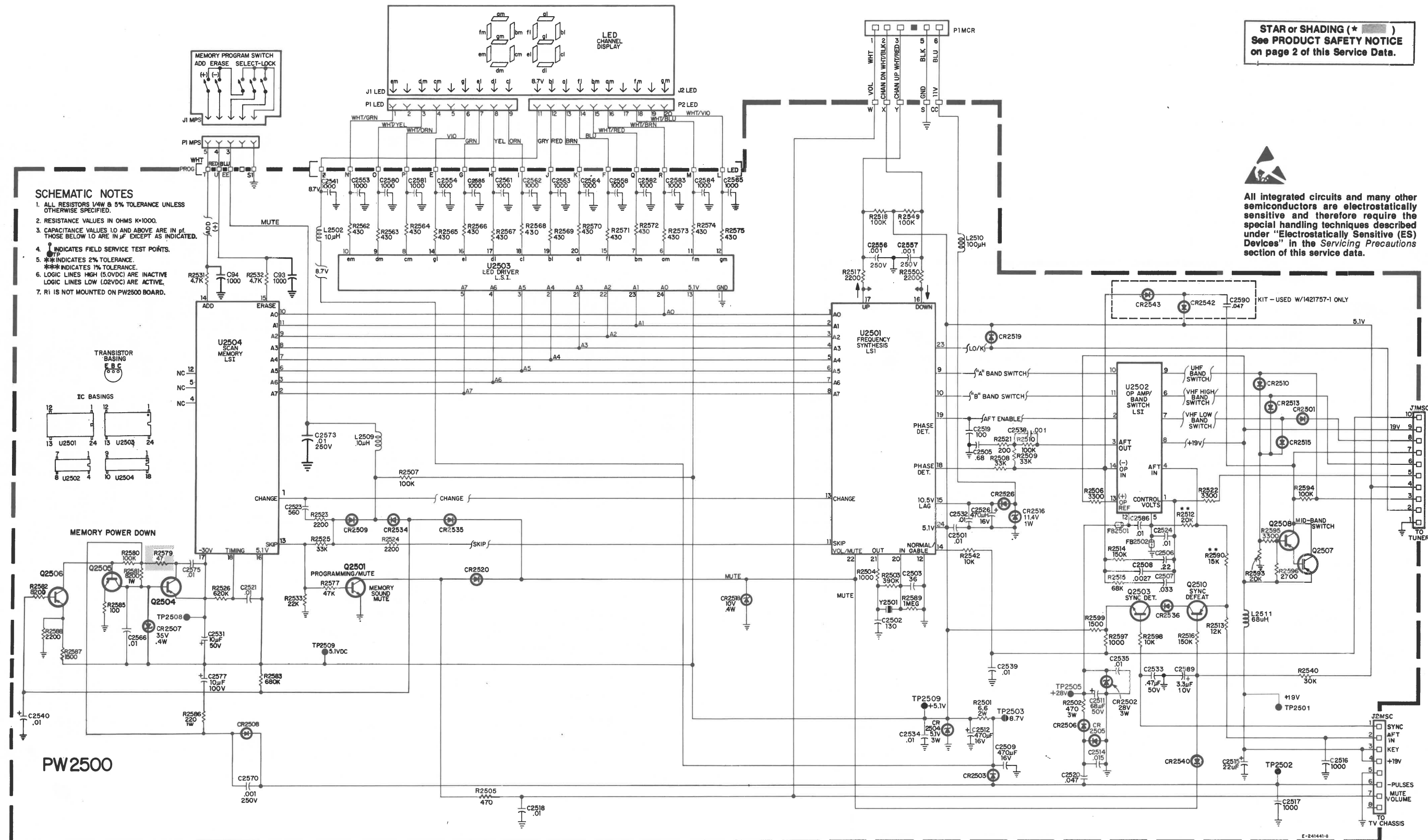


Fig. 35 — MSC 012RA Frequency Synthesis Tuner Control Schematic Diagram

Frequency Syn

The MSC is a
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some operating
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the problem to
problems relate
Assumption is n
mally and the l-

Service Proced

Use isolation tr
checks, and us

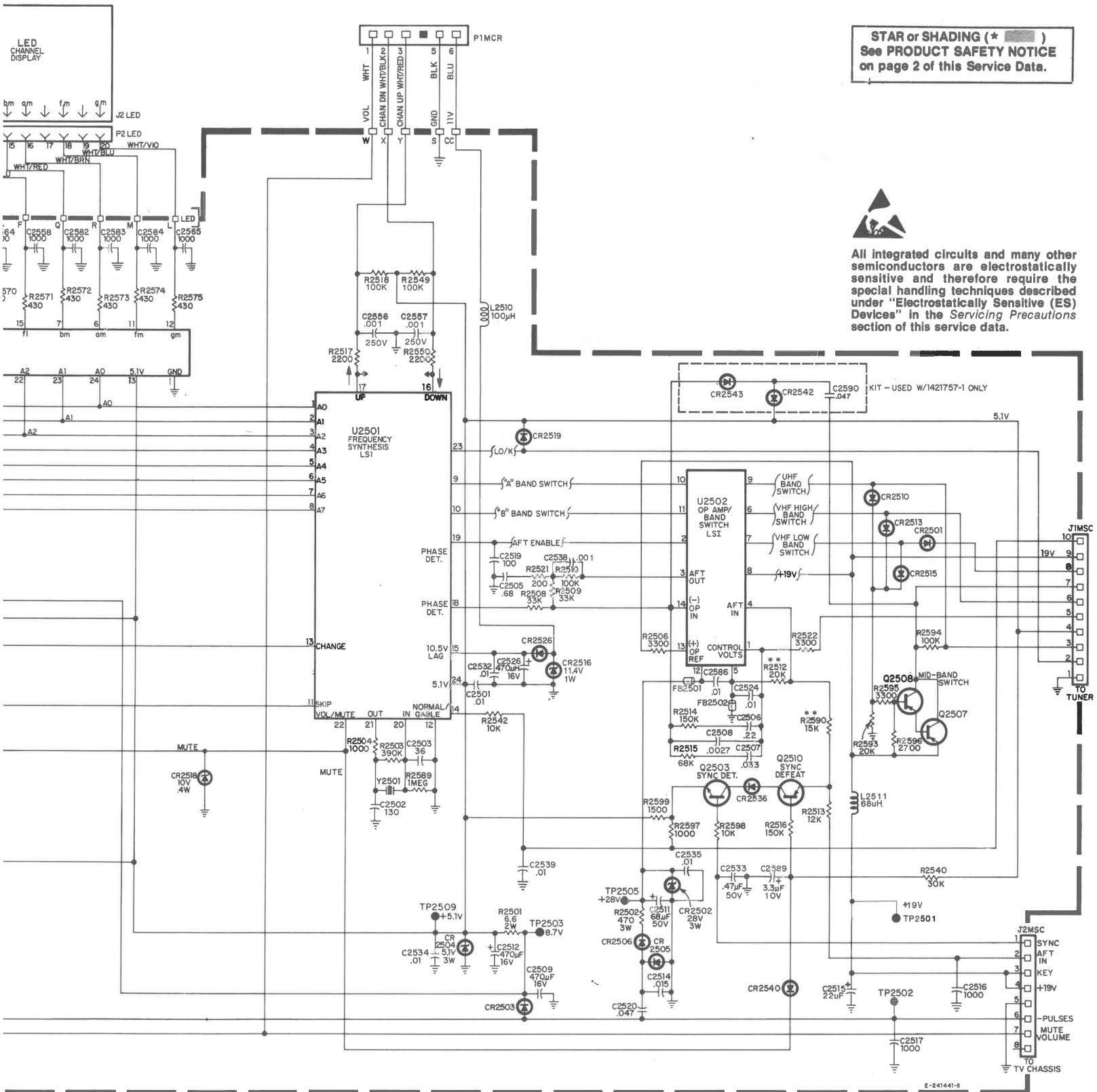
Preliminary: Ch
from MSC contr
LED readout. T
in tracking dow

1. No or Imprc
Scan UP ar
quency Syn
tions to pin:
confirm goe
terminal (S)
Scan UP/DI
lost, check
"low" cond

2. No or Imprc
Confirm prc
MSC contro

SEE "DC TUNING
VOLTAGE AND PRI
SCALER FREQUEN
CHART FOR TUNE

SEE "BANDSWITC
CHART OF MST TU
FOR PROPER BANK
SWITCHING VOLTA



2RA Frequency Synthesis Tuner Control Schematic Diagram

Frequency Synthesis Scan System Servicing

The MSC is a module and the isolation techniques will look at only the inputs and outputs of the module with the exception of some operating voltages located on the module itself. The servicing suggestions presented should aid the technician in isolating the problem to either a module, connector, wiring, or other problems related solely to the MSC tuner control. Assumption is made that the MST tuner module is operating normally and the I-F link cable is not defective.

Service Procedure

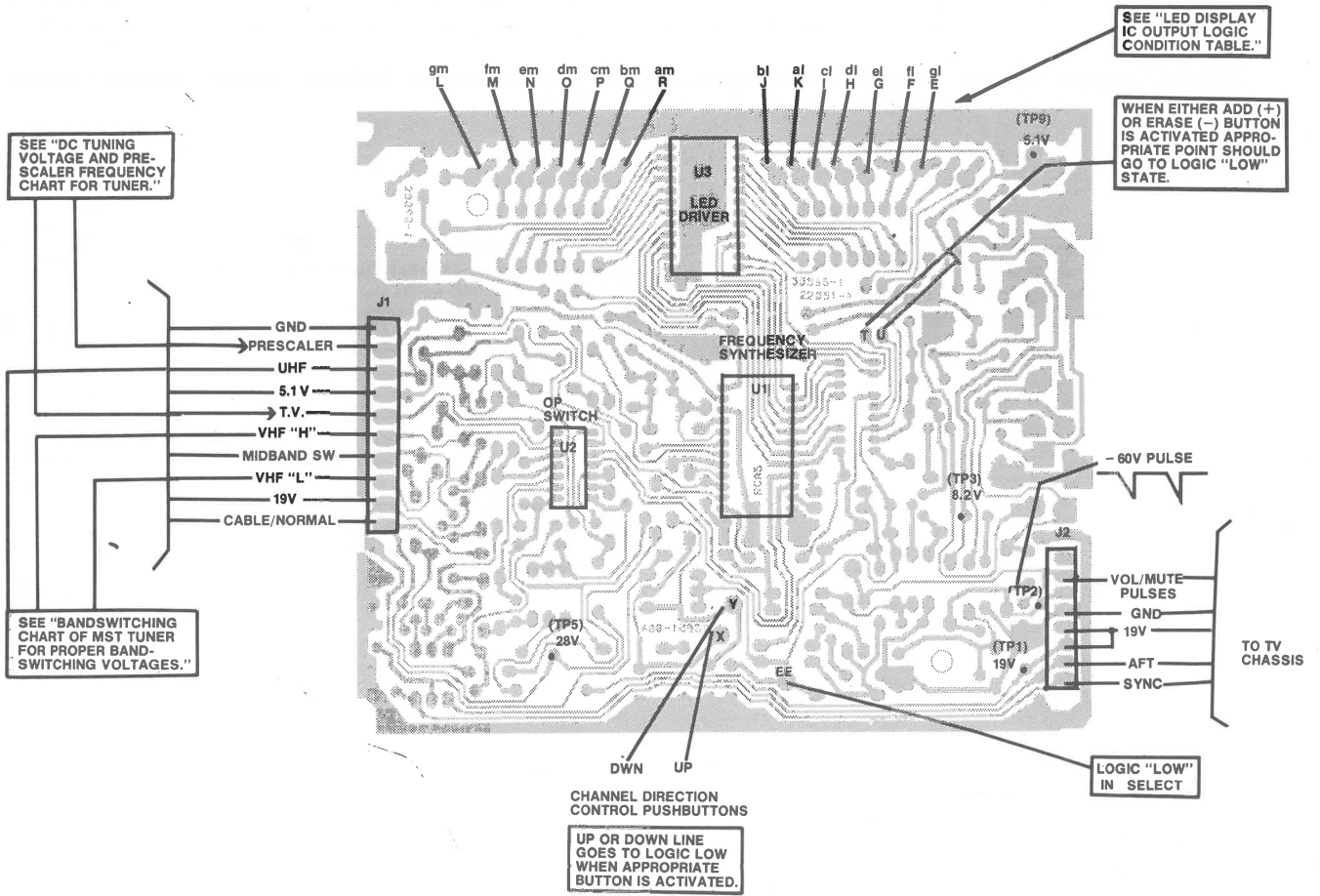
Use isolation transformer, disconnect line cord during all static checks, and use insulated clipleads for dynamic checks.

Preliminary: Check all interface connections and wiring to and from MSC control module. Each time channel entry is made note LED readout. This visual indication can prove to be a useful aid in tracking down a particular problem.

1. No or Improper Channel Up/Down Action.
Scan UP and DOWN channel information requires that Frequency Synthesizer chip (U2501) receive proper logic conditions to pins 16 and 17 from the Scan Channel Switch. First, confirm good ground connection to UP/DN Switch Module terminal (S) on MSC module. If ground connection is open, Scan UP/DN capability is lost. If either UP or DOWN action is lost, check appropriate terminal on MSC module for logic "low" condition when Scan UP/DN button is pressed.
2. No or Improper Add (+) or Erase(-) of scan memory.
Confirm proper logic conditions at terminal (T) and (U) on MSC control module. Make sure Select-Lock switch is in se-

lect position and that there is a good ground connection at terminal (S) on MSC board. Appropriate add or erase line must go to logic "low" condition to indicate a add(+) or erase (-) function to Scan Memory IC (U2504). When add or erase functions are not activated, add and erase lines should be logic "high" (+5 volts DC).

3. Channel Selection OK — LED Display is Incorrect or Segments Missing. When tuner responds to correct commands and display does not, check appropriate outputs from LED Driver chip (U2503) at MSC board. Individual logic line to LED segments must be at "logic low" state for individual segments to light (logic high approximately +5V — logic low approximately +.2V). Replace MSC module if incorrect logic conditions are found. If LED channel display is found defective replace it.
4. Improper or No Volume/Mute
Check volume/mute line at J2-MSC-7 for a logic "low" condition (approx. .2V when muting) when channel is changed. Since vol/mute is a function of AFT input, check that a logic "low" condition exists when channel change is initiated. If AFT input is normal and VOL/MUTE remains in a constant +5V (logic "high") or ground (logic "low") state, replace MSC module.
5. No Tuning Voltage to MST Tuner.
Replace MSC Tuner Control Module.
See "DC Tuning Voltage and Prescaler Frequency Chart for MST Tuner" for proper tuning voltages.
6. No or Improper Channel Change or Skip.
These problems will normally indicate a defective Memory IC (U2504), replace MSC.



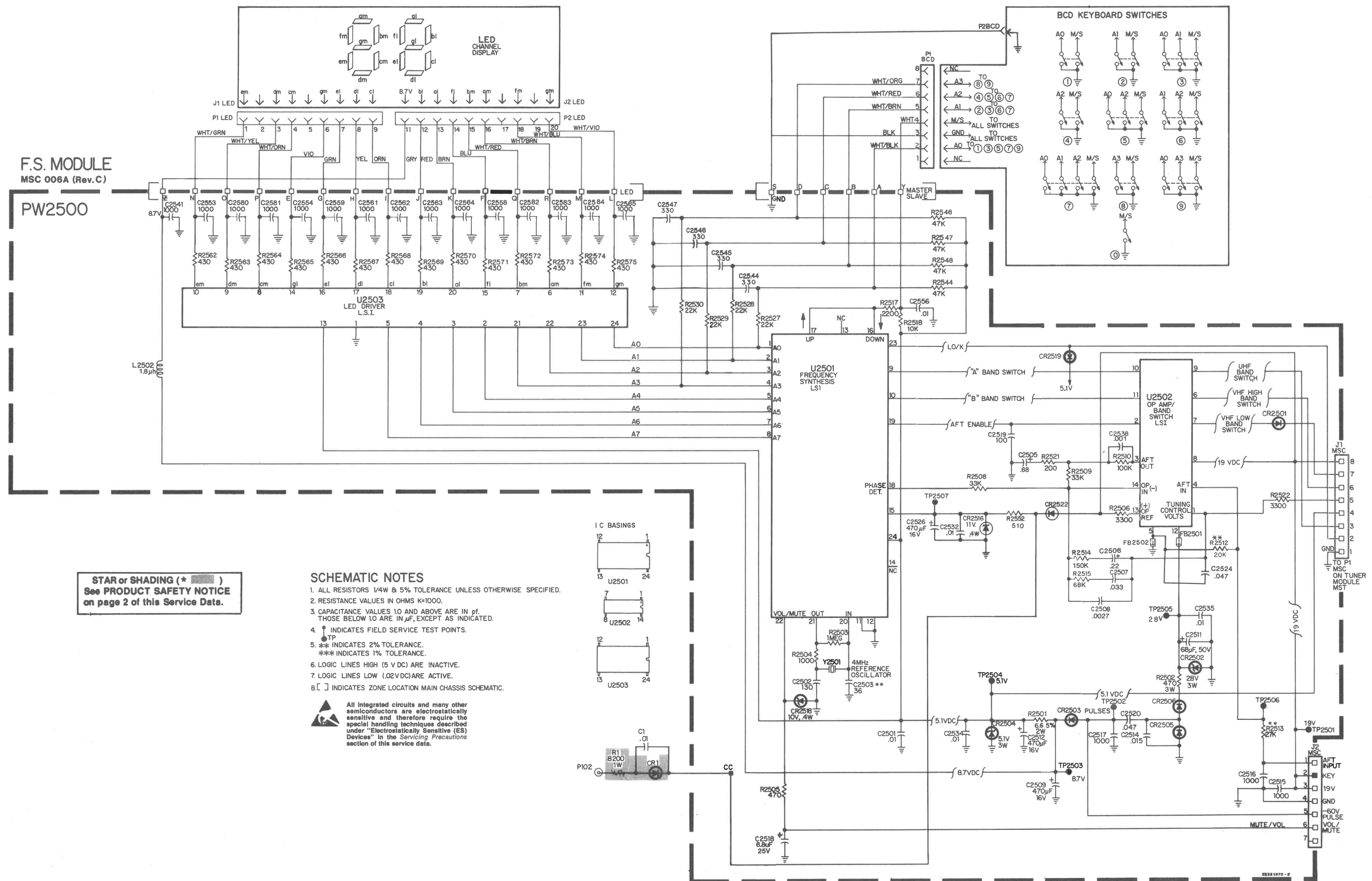


Fig. 37 — MSC 006A REV C Frequency Synthesis Tuner Control Module Schematic

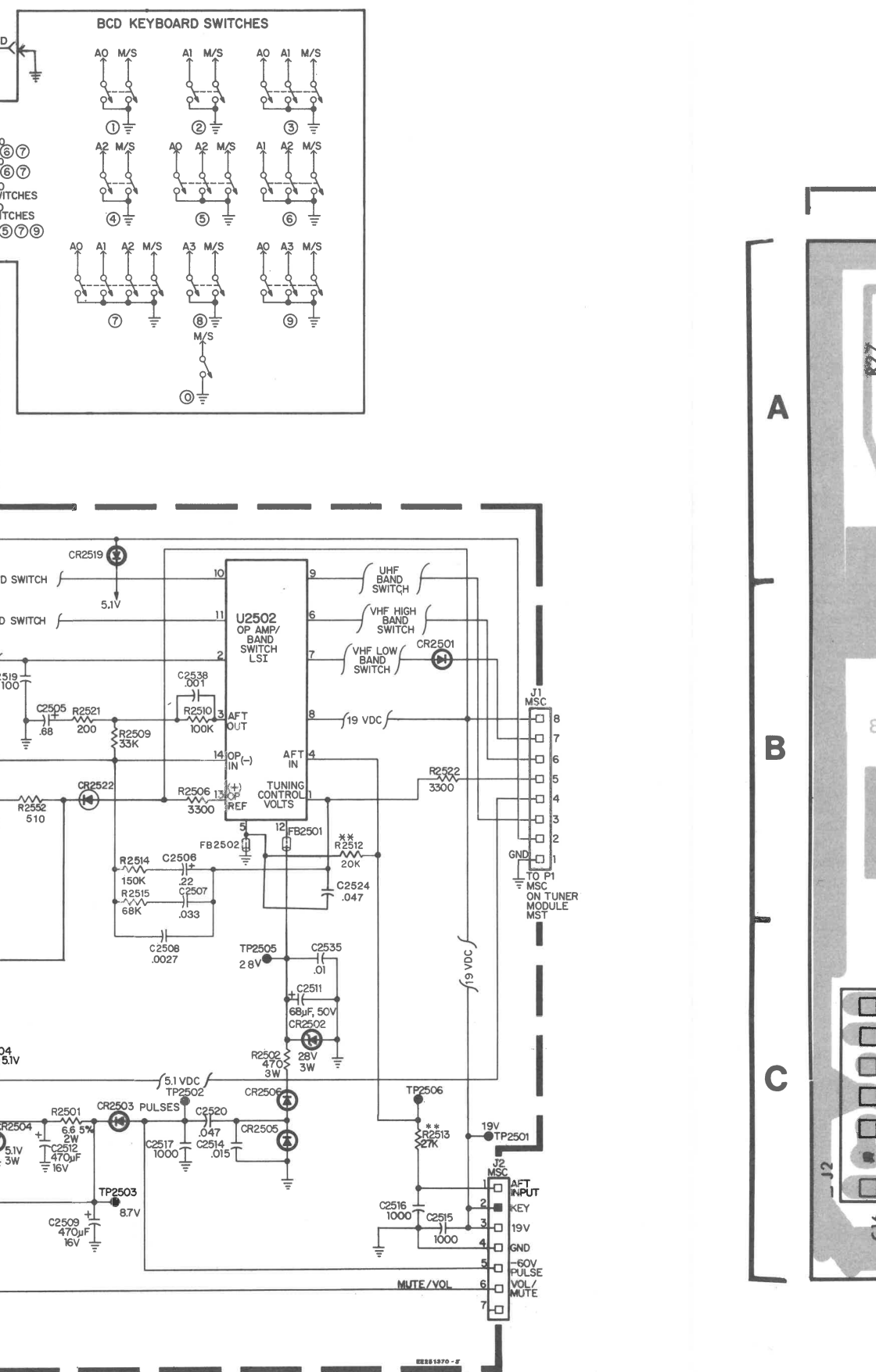
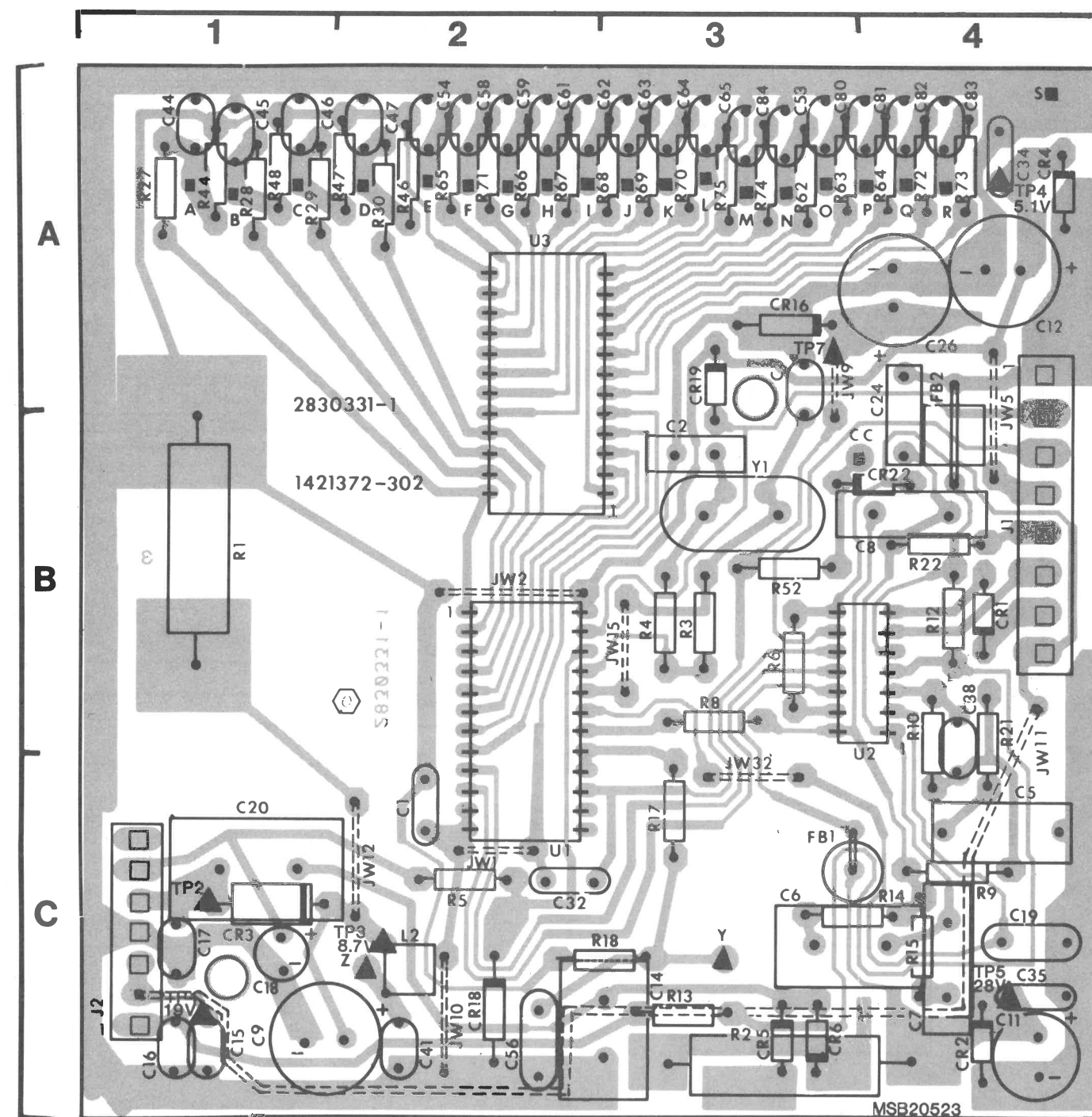
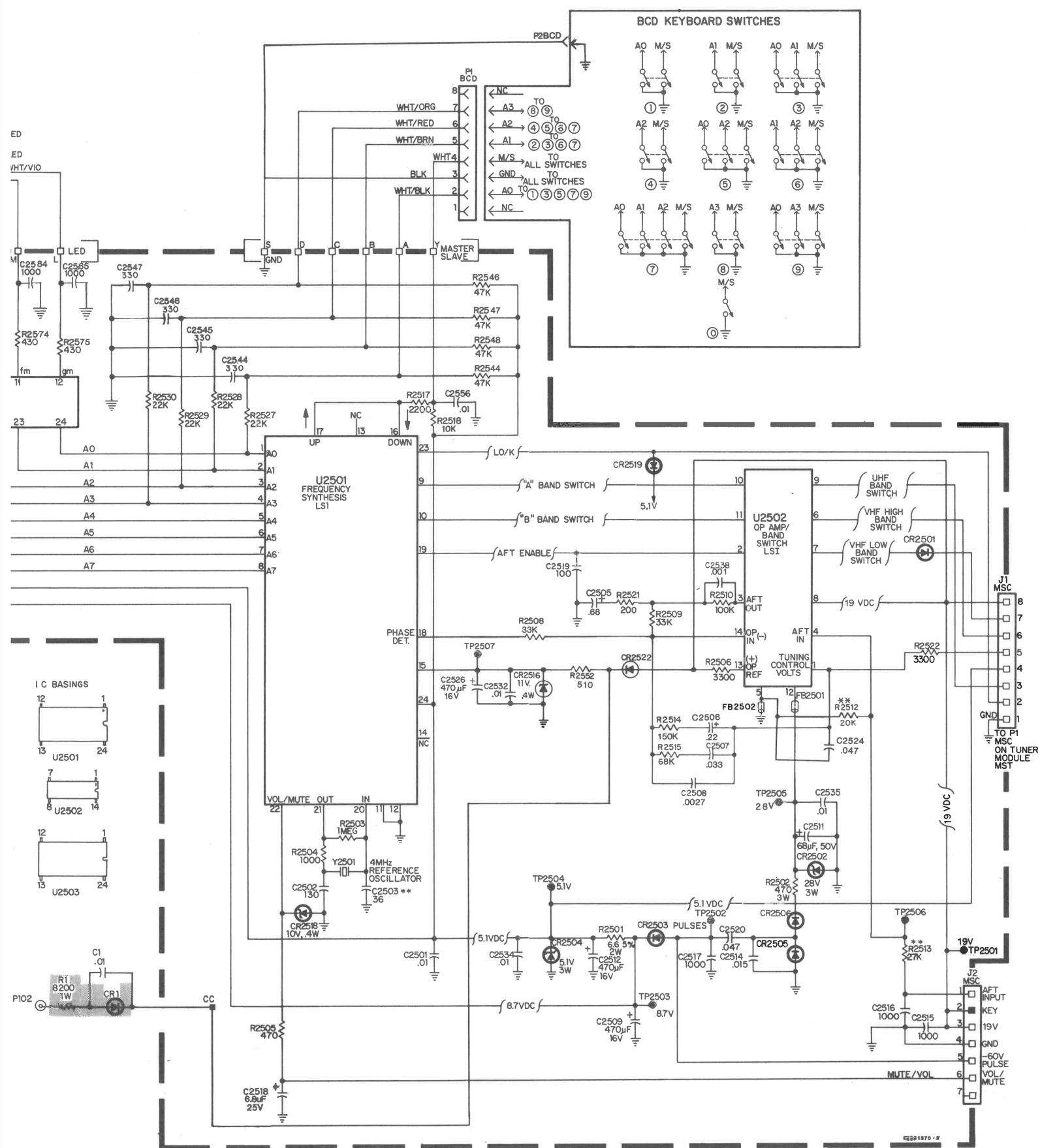


Fig. 38



Note: Add 2500 Series Prefix to Item Numbers

Fig. 38 — PW 2500 — MSC 006A Frequency Synthesis Tuner Control Module Circuit Board

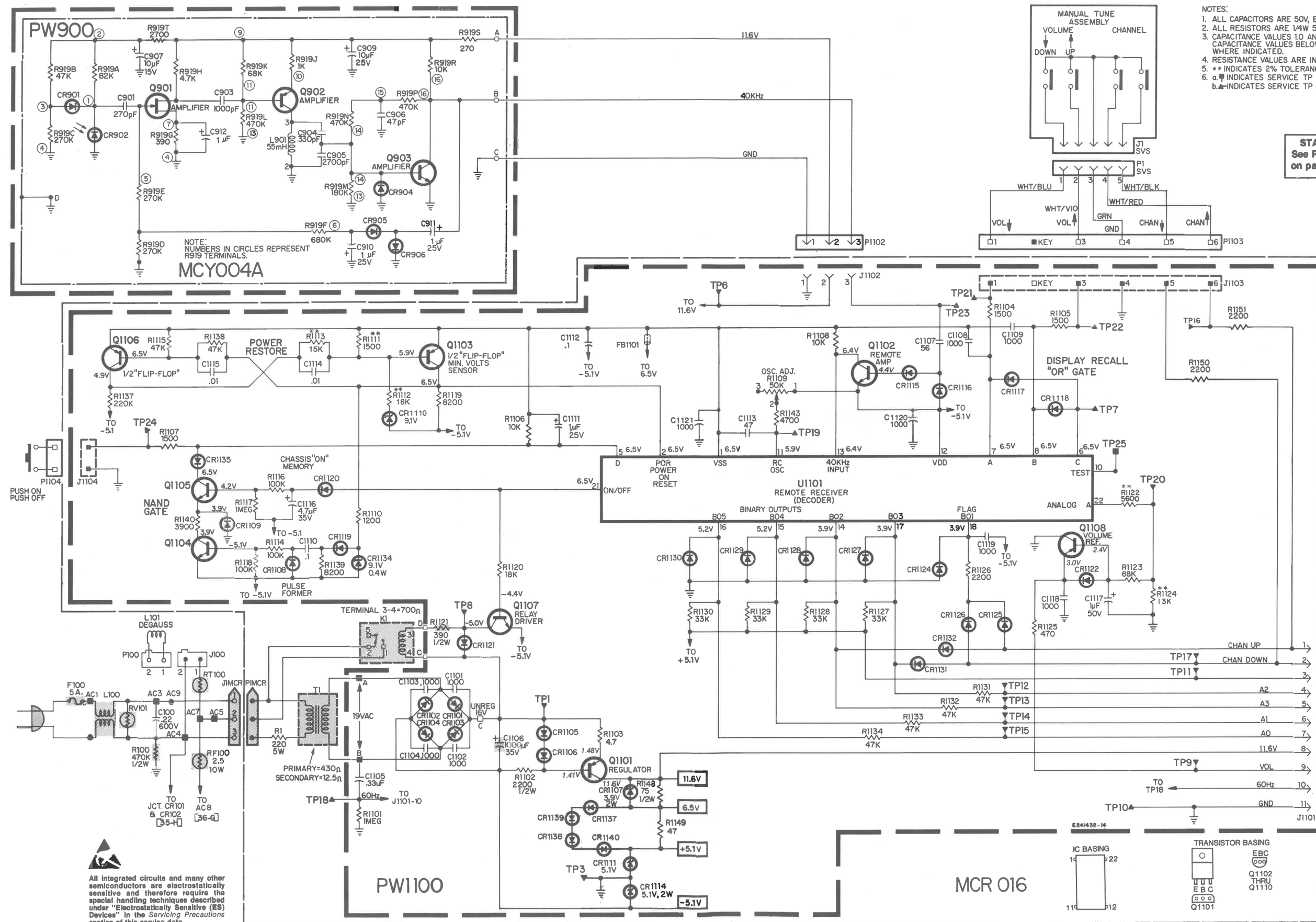
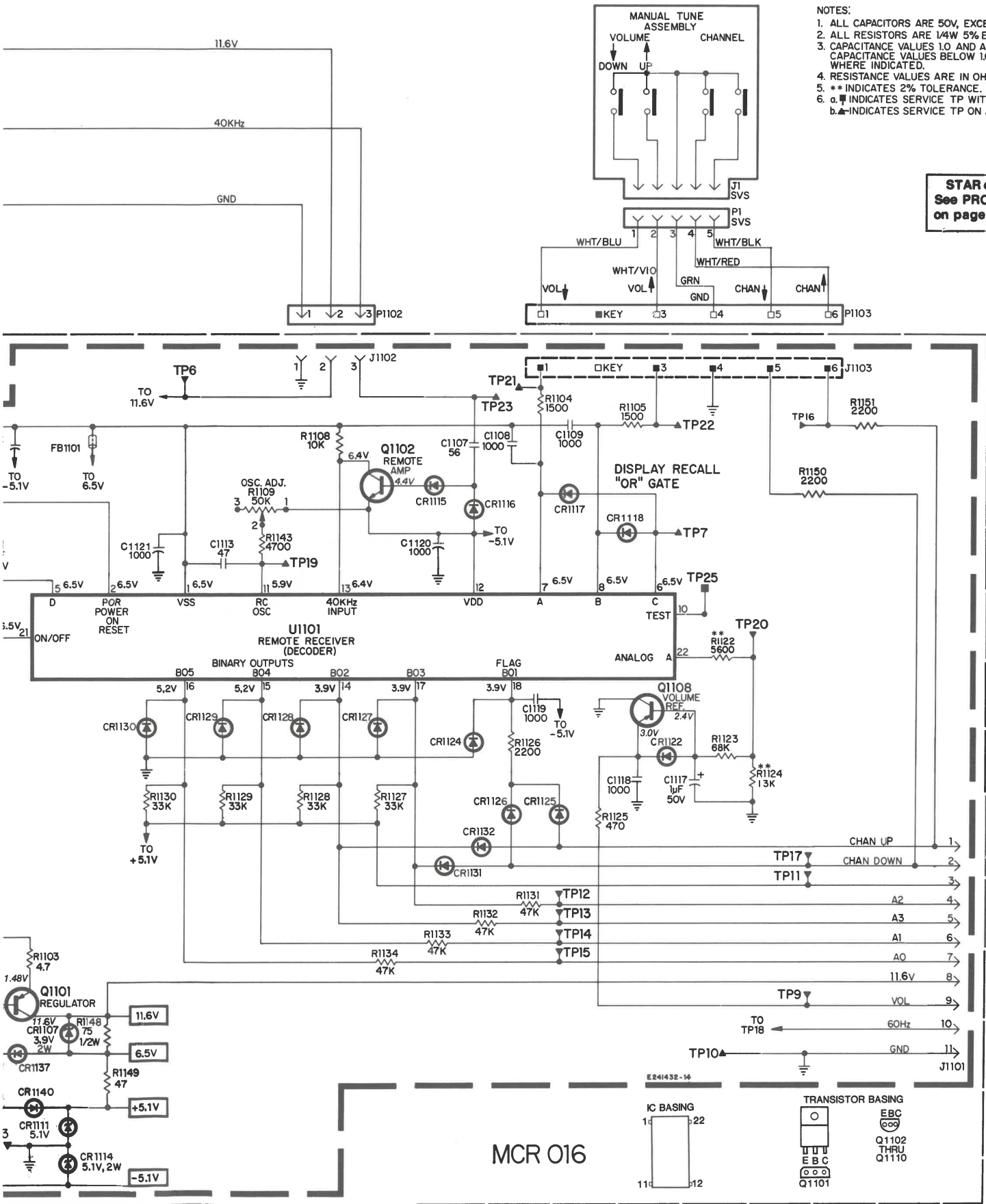


Fig. 39 — MCY004A, MCR016RA Preamp and Remote Receiver Schematic Diagram



14A, MCR016RA Preamp and Remote Receiver Schematic Diagram

- NOTES:
1. ALL CAPACITORS ARE 50V, EXCEPT WHERE INDICATED.
 2. ALL RESISTORS ARE 1/4W 5% EXCEPT WHERE INDICATED.
 3. CAPACITANCE VALUES 1.0 AND ABOVE ARE IN pf, CAPACITANCE VALUES BELOW 1.0 ARE IN uf, EXCEPT WHERE INDICATED.
 4. RESISTANCE VALUES ARE IN OHMS. K=1000.
 5. ** INDICATES 2% TOLERANCE.
 6. a. INDICATES SERVICE TP WITH STAKE.
b. INDICATES SERVICE TP ON A COMPONENT LEAD.

STAR or SHADING (*)
See PRODUCT SAFETY NOTICE
on page 2 of this Service Data.

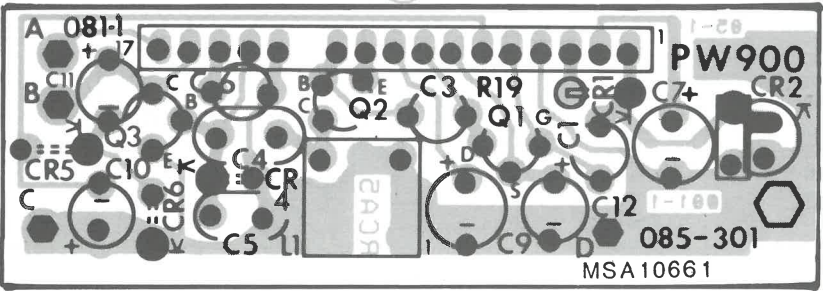
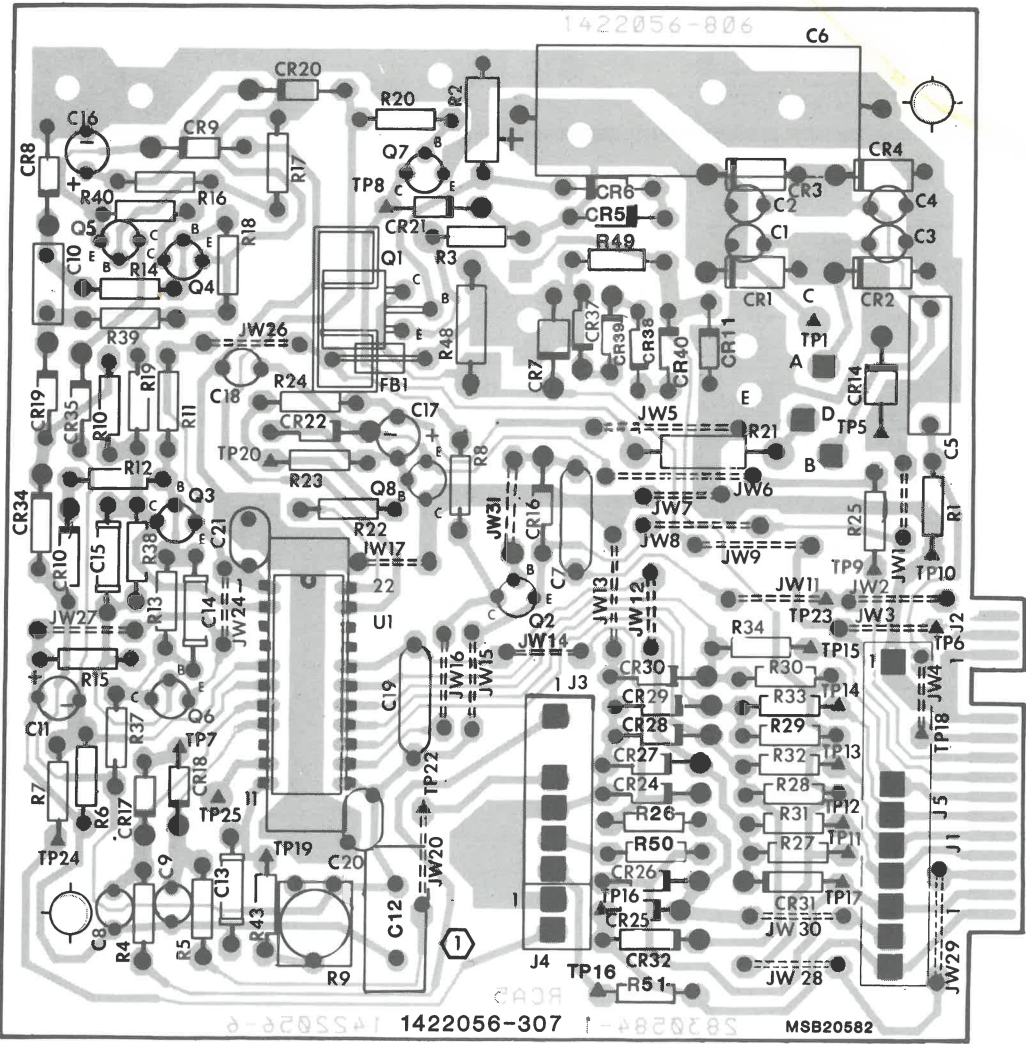


Fig. 40b - MCY004 1/R Preamp Circuit Board



Note: Add 1100 Series Prefix to Item Numbers
Fig. 40a - MCR016RA Remote Receiver Module Circuit Board

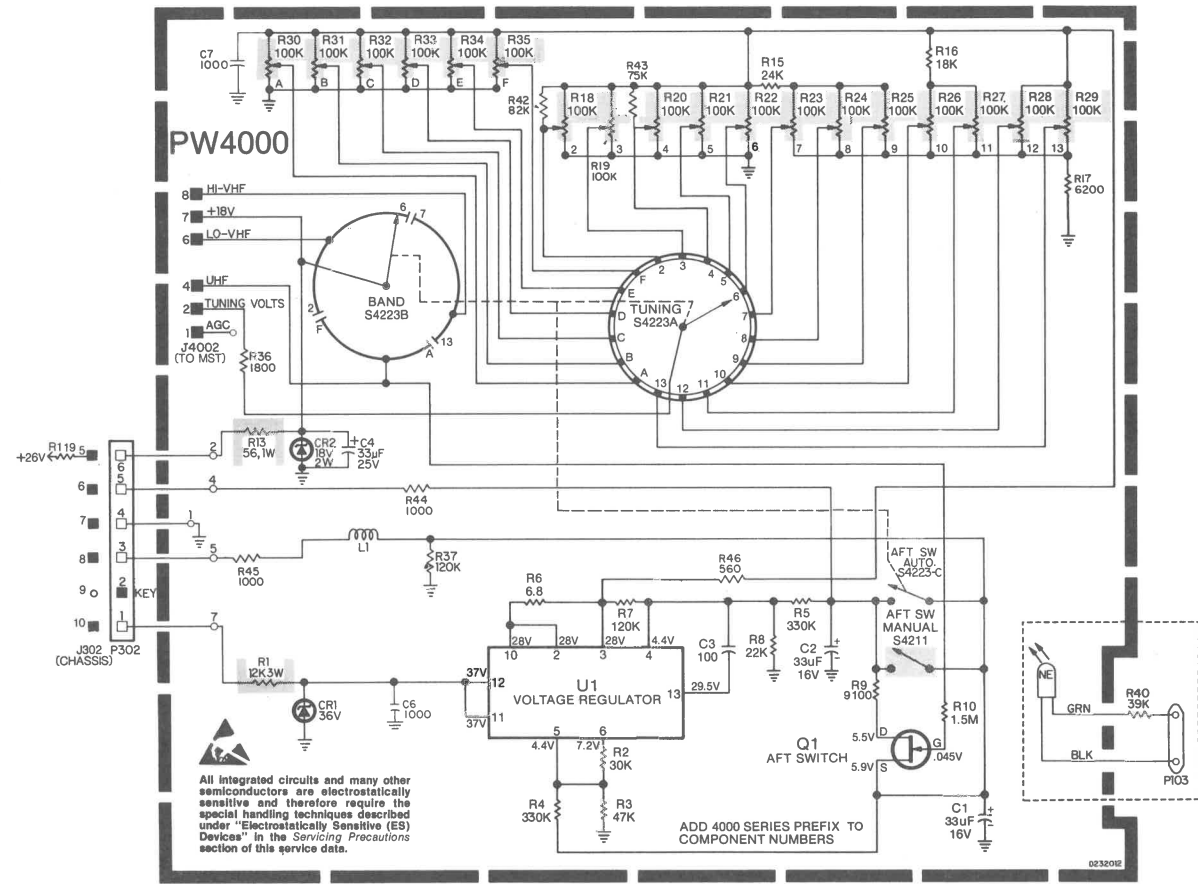


Fig. 41 — VTCA 5A Schematic

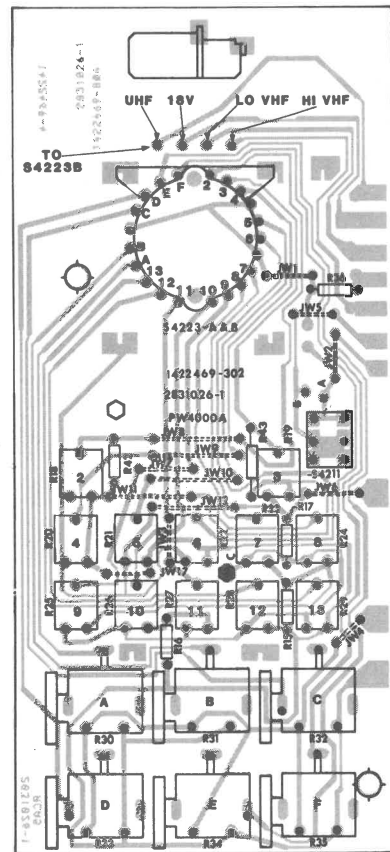


Fig. 42 — PW 4000 Circuit Board

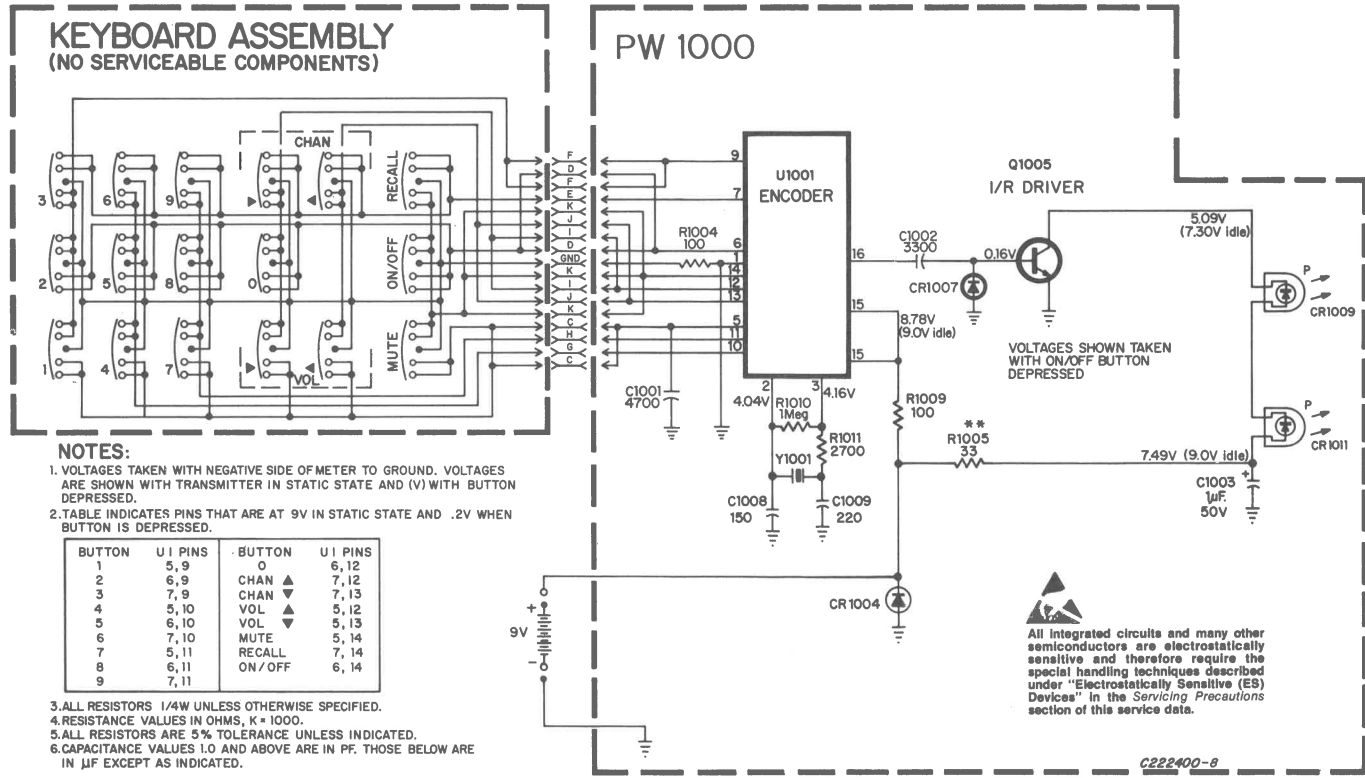
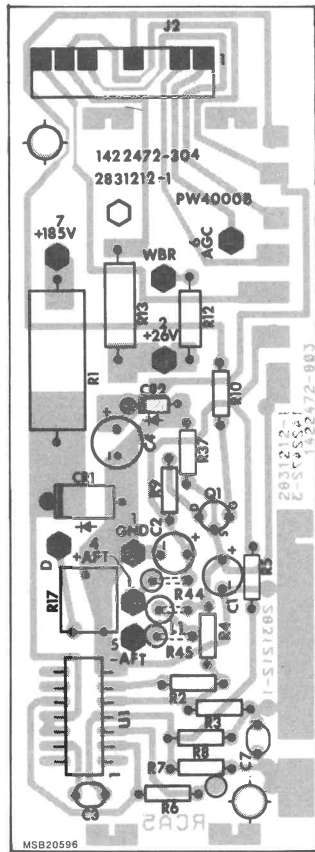


Fig. 43 — CRK 28 Remote Transmitter Schematic

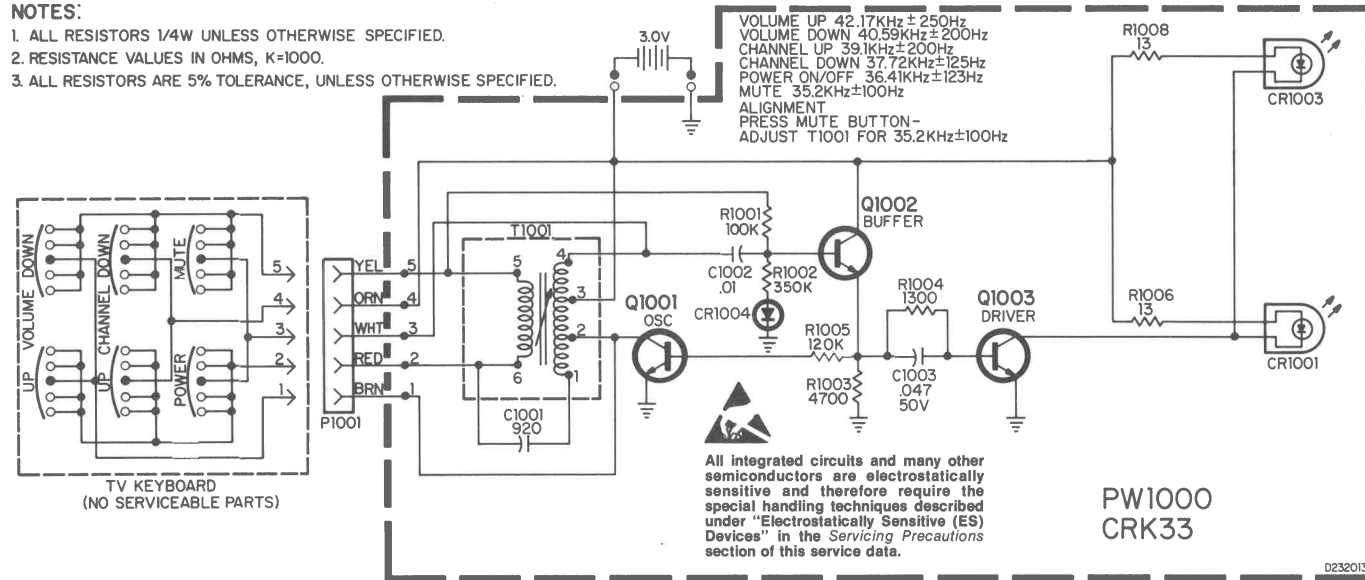


Fig. 45 — CRK 28 PW 1000 Circuit Board

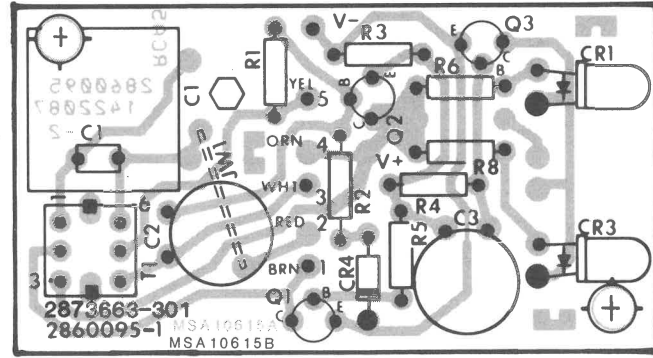


Fig. 46 — CRK 33 PW 1000 Circuit Board

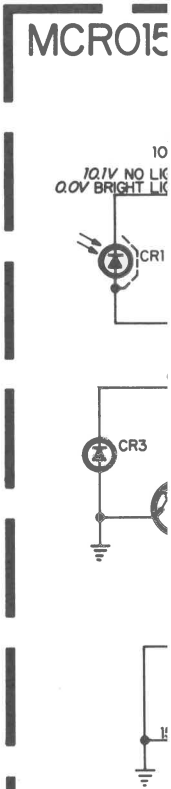


Fig. 44 — CRK 33 Remote Transmitter Schematic

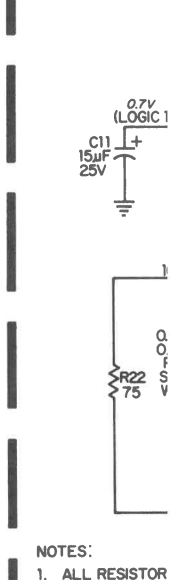


Fig. 45 — CRK 28 PW 1000 Circuit Board



Fig. 46 — CRK 33 PW 1000 Circuit Board

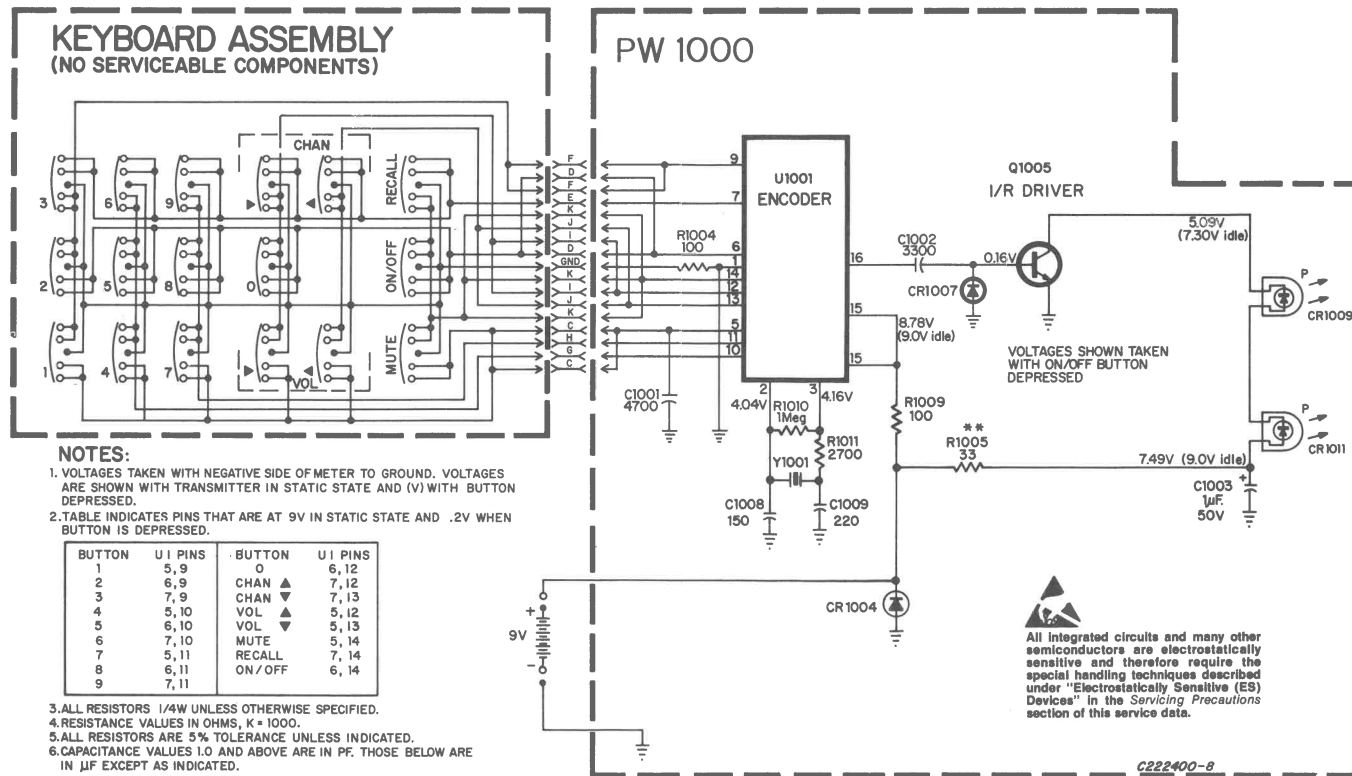


Fig. 43 — CRK 28 Remote Transmitter Schematic

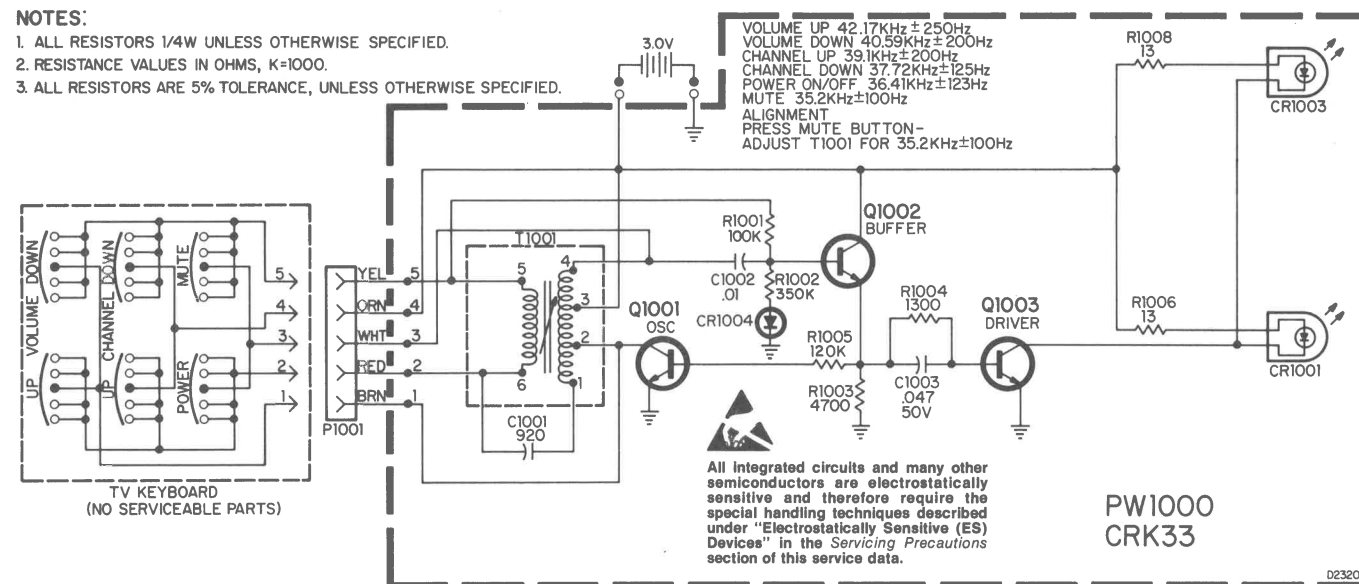


Fig. 44 — CRK 33 Remote Transmitter Schematic

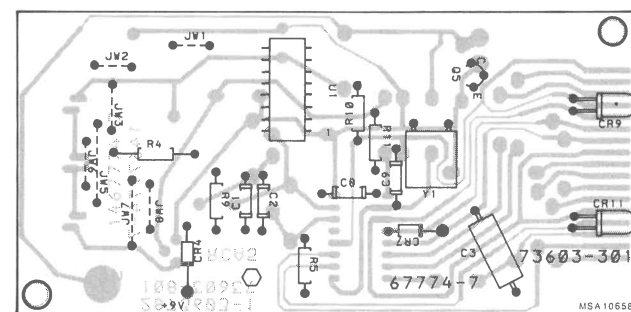


Fig. 45 — CRK 28 PW 1000 Circuit Board

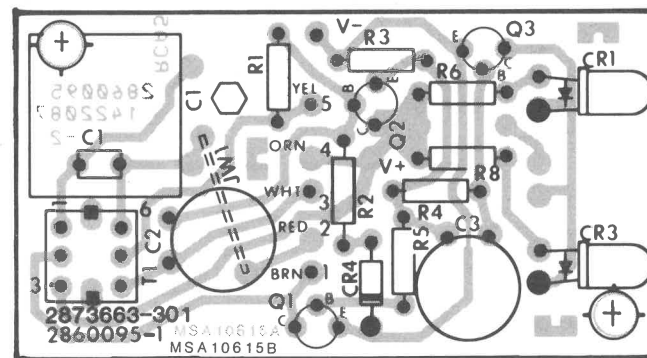


Fig. 46 — CRK 33 PW 1000 Circuit Board

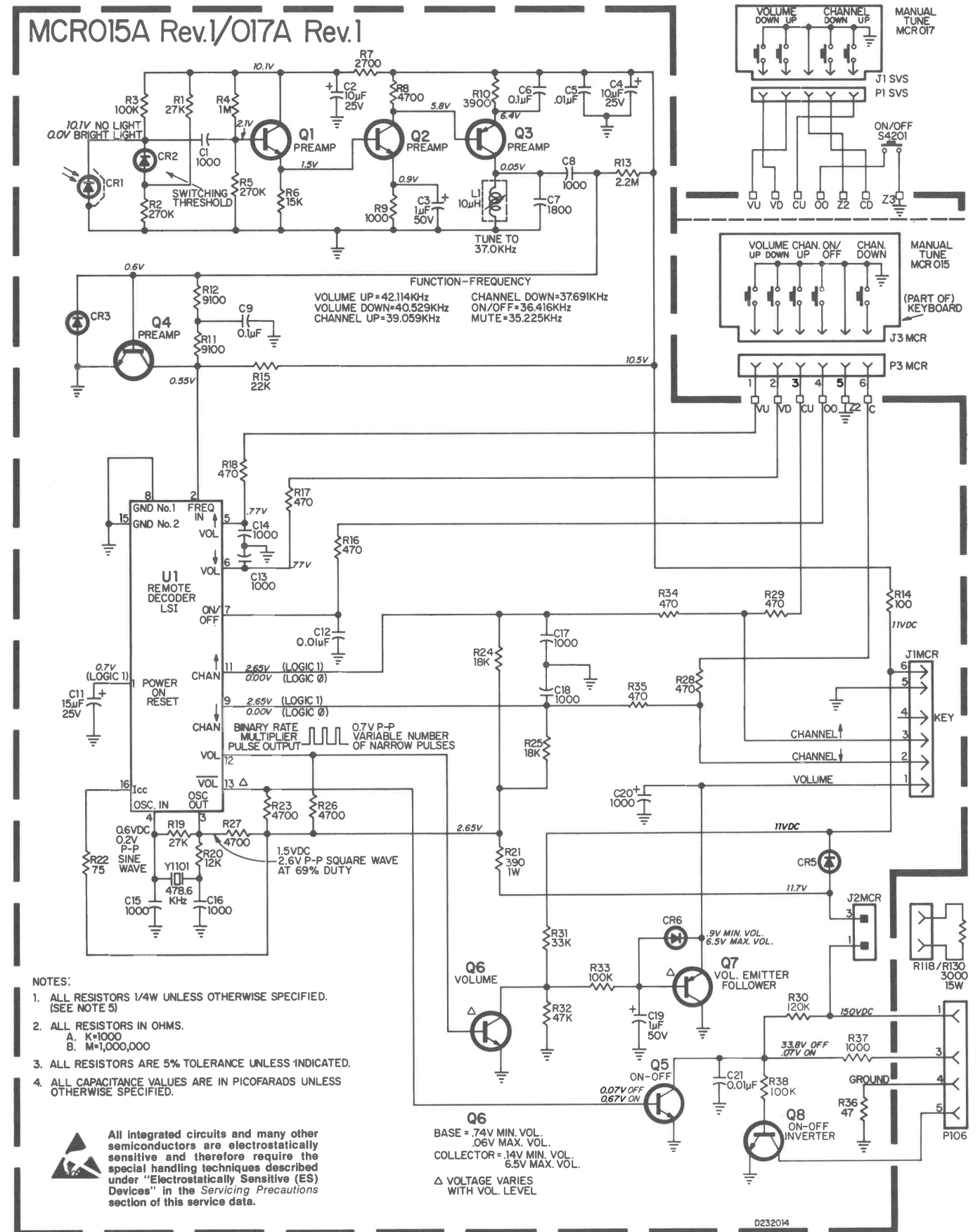


Fig. 47 — Remote Receiver Schematic

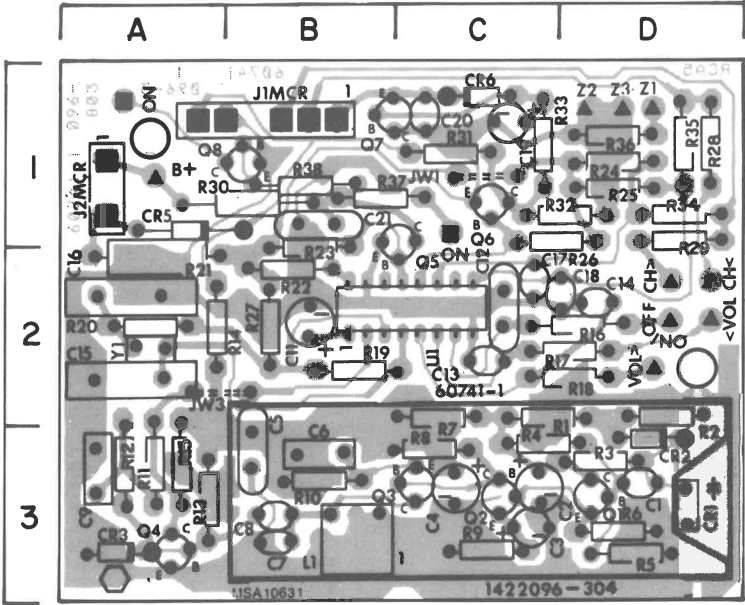


Fig. 48 — MCR 015A/17A Rev 1 Remote Receiver Module PW Circuit Board

The Remote Scan system includes the MCR 015A/017A Remote Receiver which utilizes Remote Decoder IC (U1). This IC processes channel up-down, on-off, and volume up-down information from the remote transmitter and sends appropriate voltages to the MSC control module. The Remote Receiver also processes same commands from the manual pushbutton assembly located on the TV.

Symptom(s)

- 1. No Channel Up/Down — Remote.
No Channel Up/Down — Manual Buttons.
No Channel Up/Down (Remote or Manual).
- 2. No or Improper Volume Up/Down — Remote
No or Improper Volume Up/Down — Manual Buttons.
No or Improper Volume Up/Down — Remote or Manual.
- 3. No Remote Control Action.
- 4. No On-Off Action From Either Remote or Manual Buttons.

Service Procedure

Use isolation transformer, disconnect line cord during all static checks, and use insulated clip leads for dynamic checks.

Preliminary: Check all interface connections and wiring to and from Remote Receiver MCR and other assemblies associated with this system.

- 1. No Channel Up/Down — Remote (A)
No Channel Up/Down — Manual Button (B)
No Channel Up/Down — Remote or Manual (C)
 - A. Monitor logic condition at J1MCR-2 and J1MCR-3; should go low when channel button is depressed. If logic condition is "low" at all times, problem may be defective component on Remote Receiver board.
 - B. If instrument responds to remote control channel up/down, but does not respond to manual channel up/down, check connections between P1SVS and J1SVS (MCR017) or P3MCR and J3MCR (MCR015).
 - C. Check logic conditions at X and Y on MSC control module. If proper logic conditions are not available on MSC board, replace MCR Remote Receiver. If proper logic conditions are available on MSC module and user does not get correct command function, replace MSC control module.
- 2. No or Improper Volume Up/Down — Remote (A)
No or Improper Volume Up/Down — Manual Buttons (B)
No or Improper Volume Up/Down — Remote or Manual (C)

- A. Confirm good connections at P/J1MCR. If connections check out, replace MCR Remote Receiver.
- B. Confirm good connections at P/J1SVS or P/J3MCR. If problem still exists, replace MCR Remote Receiver.
- C. No or improper volume up/down in remote or manual operation usually indicates a problem associated with the Remote Decoder IC (U1), or a problem associated within the TV sound section. First, monitor the DC voltage at J1MCR-1 on the MCR module; press the volume up/down buttons and confirm that DC voltage tracks when appropriate button is pressed. If voltage does not change — replace MCR module.
- 3. No Remote Control Action (Manual OK).
Problem like this will usually indicate defect in the remote transmitter or MCR Remote Receiver.
 - A. Check battery in transmitter.
 - B. Confirm correct function command frequencies of transmitter by connecting frequency counter to Q4 collector on the MCR Remote Receiver. The frequencies are typically:

42.114 kHz Volume Up	37.691 kHz Channel Down
40.529 kHz Volume Down	36.416 kHz On/Off
39.059 kHz Channel Up	35.225 kHz Mute

This also confirms preamps Q1, Q2 and Q3 are working properly.
 - C. Confirm presence of +11 volts DC on MCR module. A good place to confirm +11 volts is at J1MCR-6 on the MCR module.
 - D. Substitute the MCR module.
- 4. No On/Off Action From Either Remote or Manual Buttons.
On/Off problems are usually confined to defects on the MCR Remote Module only.
The TV chassis +150V supply is always "ON" (as long as AC is connected to the instrument). If no action from either the remote or manual buttons occurs (after the MCR module has been substituted), the problem is probably in the TV chassis itself since the frequency "In" and On/Off manual button are both processed by U1 on the MCR module. The "ON" output of the MCR is applied to the regulator control oscillator (on the PW REG board) through P/J106-3. This enabling action allows the oscillator to operate, therefore, generating all the necessary B+ supplies for the chassis.

Test Equipment

Allow minimum of 10 minutes warm-up period for test equipment.

External Marker Generator - Capable of furnishing markers at 47.25 MHz, 45.75 MHz, 44.00 MHz, 41.25 MHz and AF modulation.

Vacuum Tube Voltmeter or Digital Voltmeter — Providing 1.5 VDC scale.

Oscilloscope — Wide band

External bias — Battery or well regulated, isolated AC operated variable DC bias supply (0-15V).

Alignment Tool — Alignment tool must have .056" square end (GC No. 9440 or equivalent).

External Power Supply — For I-F Alignment purposes it will be necessary to apply external power to the I-F processing circuit (+26 Volt to R325). It is recommended that a well filtered DC power supply capable of supplying +26V DC and at least 250 ma of current be used.

Preliminary Instructions

Remove Tuner I-F link cable from Tuner (P301).

Obtain Service line (see procedure in Service Adjustment section).

Connect approximately +5 Volt DC bias to TP 307.

Apply +26 Volts DC, external power, to input leg of R325.

Note: I-F Alignment is performed with no AC power applied to chassis.

I-F Alignment

- Step 1
 - a. Connect Marker Generator output (with 47.25 MHz marker) direct to chassis I-F input (P301).
 - b. Connect oscilloscope through detector probe (Figure 20) to input of SAW Device (SF 301 pin 4).
 - c. Adjust L301 (47.25 MHz trap) for minimum scope deflection.
- Step 2
 - a. Remove detector probe from input of SAW device (SF 301-4).
 - b. Apply 45.75 MHz marker. Measure DC voltage at TP 301 (collector circuit of I-F output Q303).
 - c. Increase I-F AGC bias until voltage at TP 301 decreases approximately 0.5V.
 - d. Adjust L303 for minimum output voltage at TP 301. (If during this adjustment voltage at TP 301 drops below 3.8 Volts decrease I-F AGC bias to match voltage obtained in Step b.
 - e. Increase I-F AGC bias until voltage at TP 301 decreases by an additional 0.8V.
 - f. Adjust L303 for minimum output voltage at TP 301 (if voltage drops below 3.0 Volts repeat Step 2 complete).

AFT Alignment

- Step 3
 - a. Apply +5V I-F AGC bias to TP 307.
 - b. With no signal applied, adjust AFT balance controls R332 and R333 for 6.5V DC at junction of R327, C315 and TP309.

- c. Remove AGC bias from TP 307. Apply 45.75 MHz marker (to I-F input P301) and adjust L304 for 6.5V DC output at junction of R326, and C314.

SAW Matching

- Step 4
 - a. Apply +5V DC bias at TP 307.
 - b. Connect VTVM to TP 301.
 - c. Apply marker generator with 44.00 MHz marker to I-F input (P301)(TP303).
 - d. Increase bias voltage slowly until video output voltage, at TP 301, decreases by approximately 1.0 Volt.
 - e. Adjust L302 counterclockwise until voltage at TP 301 begins to increase. Then adjust L302 clockwise until voltage at TP 301 just ceases to decrease.

4.5 MHz Traps

- Step 5
 - a. Apply +5V AGC bias to TP 307.
 - b. Apply marker generator output with 45.75 MHz and 41.25 MHz markers, with AF modulation to I-F input (P301)(TP303).
 - c. Connect oscilloscope through detector probe (figure 43) to TP 301 (collector of I-F output, Q303).
 - d. Adjust I-F AGC bias to produce usable scope trace.
 - e. Detune T301 approximately 1 turn (if necessary) to observe modulation.
 - f. Adjust T301 for minimum modulation.

Remove all test equipment and external voltage connections.

Contrast Preset (R715)

Adjust Contrast Preset Control, R715 to 2.5V DC to produce Black to White signal at U701, pin 21 (TP702) with 100 IRE luminance input signal (this does not include blanking). Pull kine socket to assure set is not in beam limiting.

Chroma Peak Level (R805)

Adjust Chroma Peak Level Control (R805) to produce 125mV p-p chroma burst signal at TP 801.

3.58 MHz Oscillator Adjust (AFPC)

Connect color bar generator to Antenna input. Adjust tint control (R4204) to mid-range and color control (R4203) for normal viewing. Connect TP 801, via a short clip lead to ground. Connect TP 301 via a 270 pf capacitor to pin 17 of IC 701. Adjust trimmer capacitor C818 for zero beat (stable or slow moving color bars on screen display). Remove clip lead from TP 801 and 270 pf capacitor from TP 301 to pin 17 of IC 701.

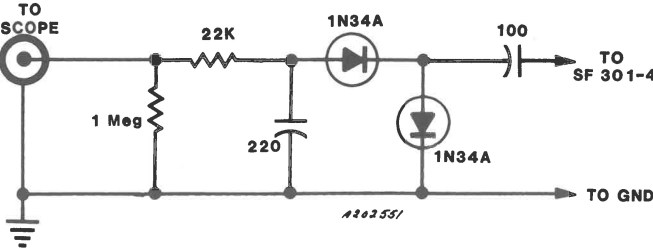
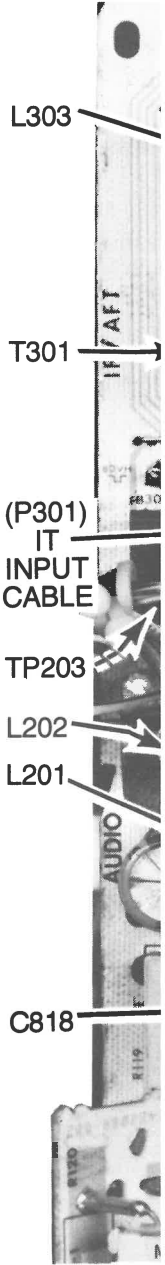


Fig. 49 — Detector Probe



SOUND Align

- a. Apply a stan er modulate natively a 4.
- b. Connect os
- c. Set volume i at speaker, i
- d. Reduce sign noted level.

Test Equipment

Allow minimum of 10 minutes warm-up period for test equipment.

External Marker Generator - Capable of furnishing markers at 47.25 MHz, 45.75 MHz, 44.00 MHz, 41.25 MHz and AF modulation.

Vacuum Tube Voltmeter or Digital Voltmeter — Providing 1.5 VDC scale.

Oscilloscope — Wide band

External bias — Battery or well regulated, isolated AC operated variable DC bias supply (0-15V).

Alignment Tool — Alignment tool must have .056" square end (GC No. 9440 or equivalent).

External Power Supply — For I-F Alignment purposes it will be necessary to apply external power to the I-F processing circuit (+26 Volt to R325). It is recommended that a well filtered DC power supply capable of supplying +26V DC and at least 250 ma of current be used.

Preliminary Instructions

Remove Tuner I-F link cable from Tuner (P301).

Obtain Service line (see procedure in Service Adjustment section).

Connect approximately +5 Volt DC bias to TP 307.

Apply +26 Volts DC, external power, to input leg of R325.

Note: I-F Alignment is performed with no AC power applied to chassis.

I-F Alignment

- Step 1 a. Connect Marker Generator output (with 47.25 MHz marker) direct to chassis I-F input (P301).
- b. Connect oscilloscope through detector probe (Figure 20) to input of SAW Device (SF 301 pin 4).
- c. Adjust L301 (47.25 MHz trap) for minimum scope deflection.
- Step 2 a. Remove detector probe from input of SAW device (SF 301-4).
- b. Apply 45.75 MHz marker. Measure DC voltage at TP 301 (collector circuit of I-F output Q303).
- c. Increase I-F AGC bias until voltage at TP 301 decreases approximately 0.5V.
- d. Adjust L303 for minimum output voltage at TP 301. (If during this adjustment voltage at TP 301 drops below 3.8 Volts decrease I-F AGC bias to match voltage obtained in Step b.
- e. Increase I-F AGC bias until voltage at TP 301 decreases by an additional 0.8V.
- f. Adjust L303 for minimum output voltage at TP 301 (if voltage drops below 3.0 Volts repeat Step 2 complete).

AFT Alignment

- Step 3 a. Apply +5V I-F AGC bias to TP 307.
- b. With no signal applied, adjust AFT balance controls R332 and R333 for 6.5V DC at junction of R327, C315 and TP309.

- c. Remove AGC bias from TP 307. Apply 45.75 MHz marker (to I-F input P301) and adjust L304 for 6.5V DC output at junction of R326, and C314.

SAW Matching

- Step 4 a. Apply +5V DC bias at TP 307.
- b. Connect VTVM to TP 301.
- c. Apply marker generator with 44.00 MHz marker to I-F input (P301)(TP303).
- d. Increase bias voltage slowly until video output voltage, at TP 301, decreases by approximately 1.0 Volt.
- e. Adjust L302 counterclockwise until voltage at TP 301 begins to increase. Then adjust L302 clockwise until voltage at TP 301 just ceases to decrease.

4.5 MHz Traps

- Step 5 a. Apply +5V AGC bias to TP 307.
- b. Apply marker generator output with 45.75 MHz and 41.25 MHz markers, with AF modulation to I-F input (P301)(TP303).
- c. Connect oscilloscope through detector probe (figure 43) to TP 301 (collector of I-F output, Q303).
- d. Adjust I-F AGC bias to produce usable scope trace.
- e. Detune T301 approximately 1 turn (if necessary) to observe modulation.
- f. Adjust T301 for minimum modulation.

Remove all test equipment and external voltage connections.

Contrast Preset (R715)

Adjust Contrast Preset Control, R715 to 2.5V DC to produce Black to White signal at U701, pin 21 (TP702) with 100 IRE luminance input signal (this does not include blanking). Pull kine socket to assure set is not in beam limiting.

Chroma Peak Level (R805)

Adjust Chroma Peak Level Control (R805) to produce 125mV p-p chroma burst signal at TP 801.

3.58 MHz Oscillator Adjust (AFPC)

Connect color bar generator to Antenna input. Adjust tint control (R4204) to mid-range and color control (R4203) for normal viewing. Connect TP 801, via a short clip lead to ground. Connect TP 301 via a 270 pf capacitor to pin 17 of IC 701. Adjust trimmer capacitor C818 for zero beat (stable or slow moving color bars on screen display). Remove clip lead from TP 801 and 270 pf capacitor from TP 301 to pin 17 of IC 701.

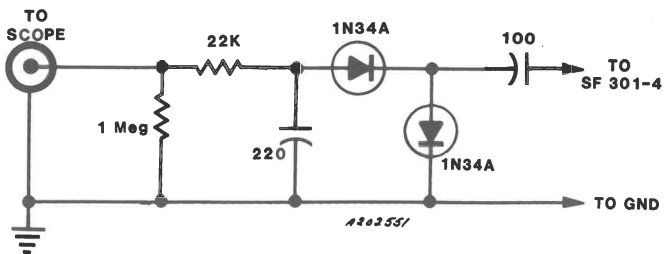


Fig. 49 — Detector Probe

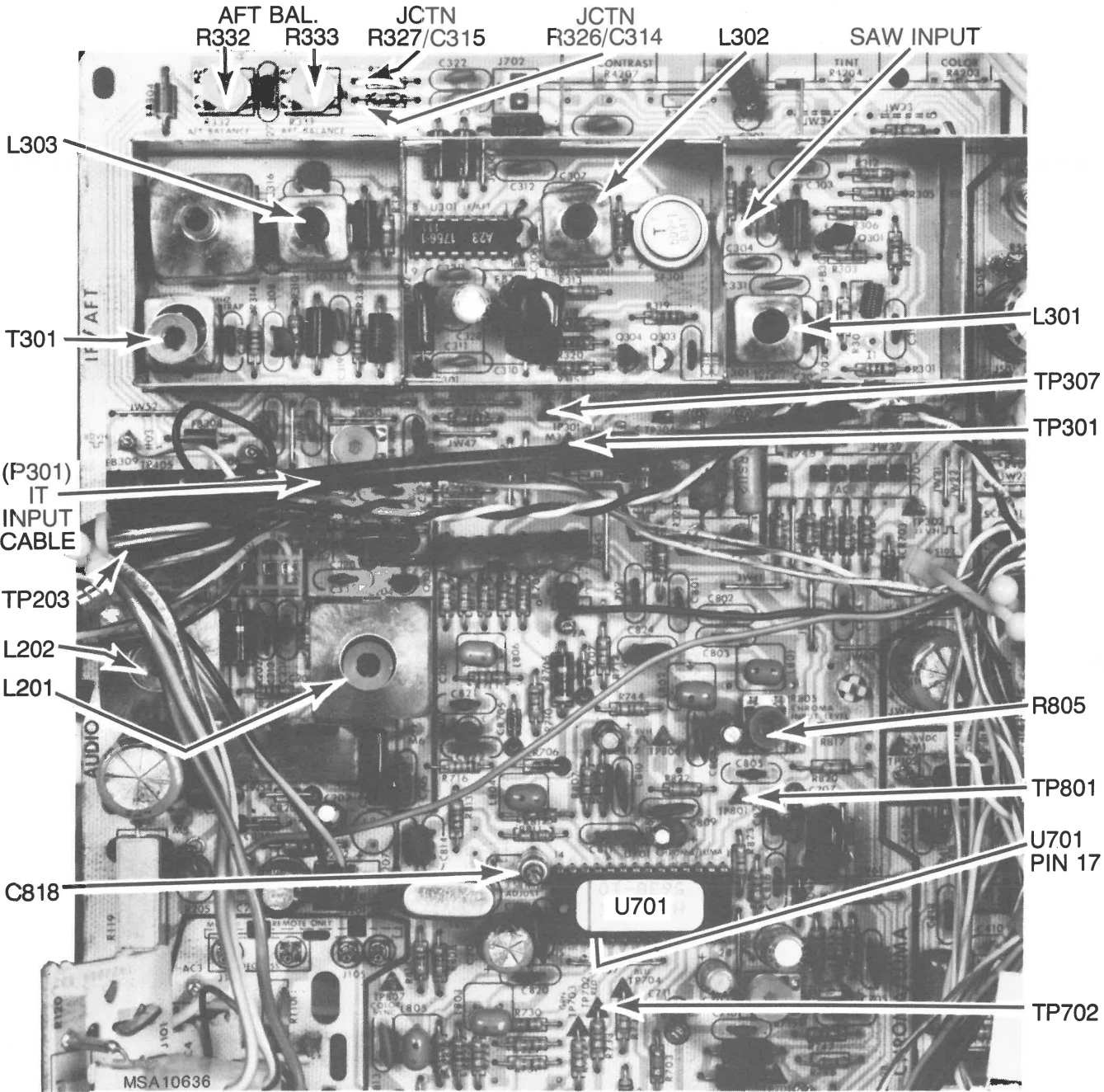


Fig. 50 — Chassis Alignment Points

SOUND Alignment (With Test Equipment)

- a. Apply a standard T/V signal to the tuner with the sound carrier modulated to 25 kHz deviation with a 400 Hz tone. (Alternatively a 4.5 MHz signal may be applied directly to TP 203).
- b. Connect oscilloscope to speaker terminals.
- c. Set volume at midrange and adjust L201 for maximum output at speaker, (note level).
- d. Reduce signal input level until output drops to one half of noted level.

- e. Adjust L202 for maximum output and minimum hiss. Note: Disregard any video modulation.

SOUND Alignment (Air Signal)

- a. Tune to a strong local station.
- b. Set volume control for normal listening and adjust L201 for maximum volume.
- c. Tune to a weak station and adjust L202 for maximum volume and minimum background noise.

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MST 021A TUNER R-F ALIGNMENT

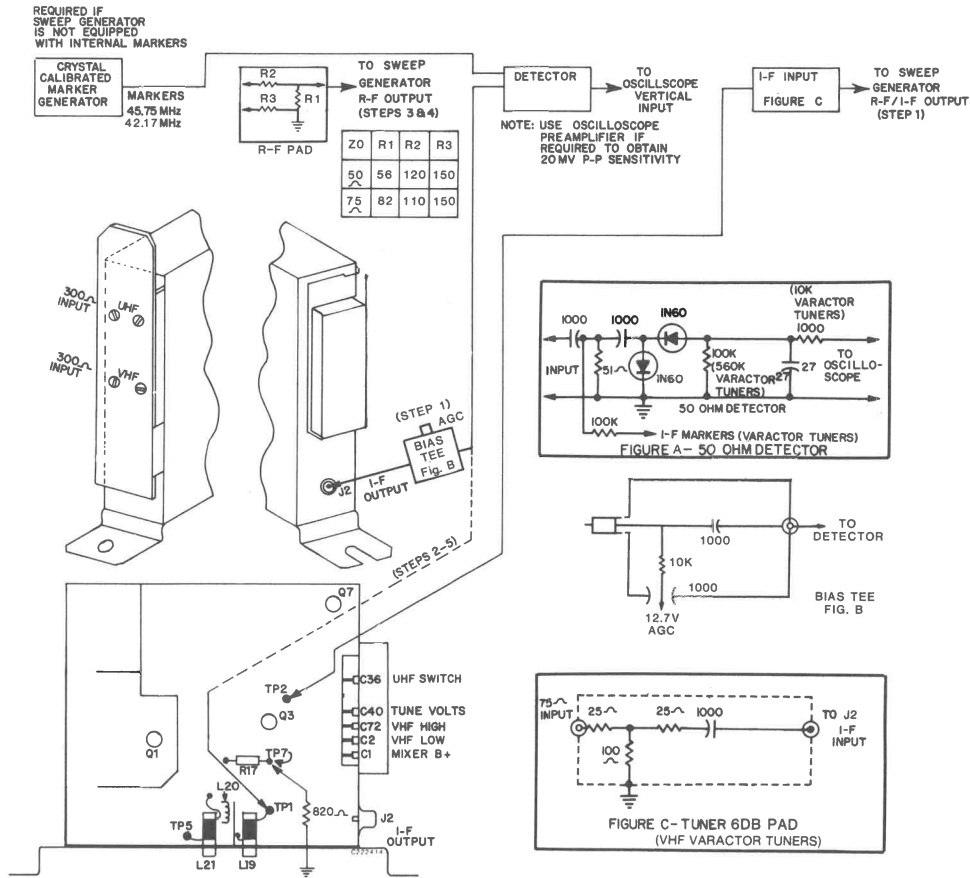


Fig. 52 — Test Equipment Hook-up (VHF)

Initial Connections:
Bias — 12.7 volts to AGC Terminal of Bias Tee
Power — +27 volts to C1.
Control Voltage — +1 to +27.5V to C40.

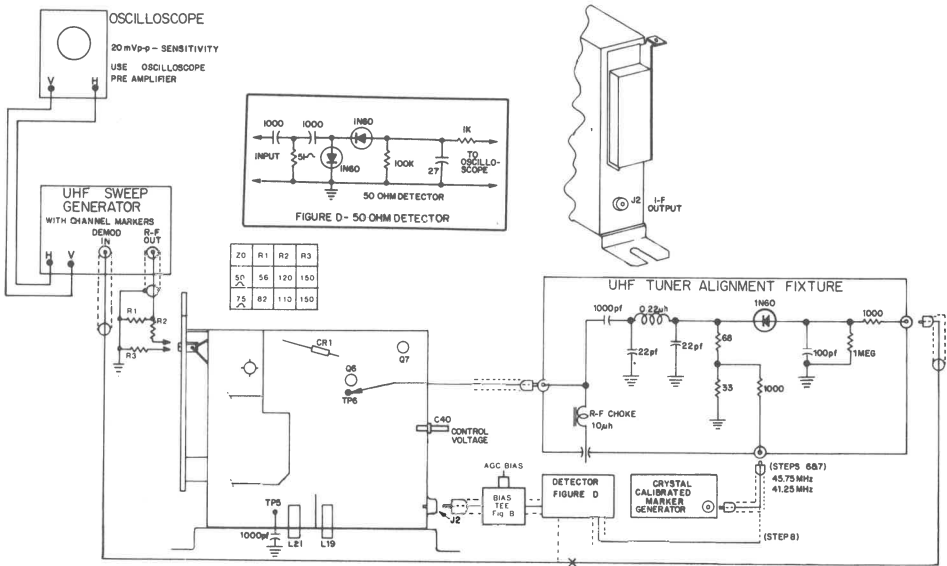


Fig. 53 — Test Equipment Hook-up (UHF)

Step 6 UHF Oscillator Alignment

Initial Connections—See Hook-up (Figure 53).
Jumper tuning volt from C1 to C36.
Preset trimmer C69 to center of its range (i.e. at an angle of approximately 25° with respect to PCB over L32).

Note: Check mixer current at TP 3. D.C. Voltage measured should be 0.20 to 0.32 volts on all Channels.

Adjust tuning voltage to 26.6 volts.
Sweep Generator — Set to channel 83.
Adjust output level to produce usable response without distortion.
Observe R-F band pass curve to be certain I-F picture marker (45.75 MHz) is coincident with (or above) the upper R-F band-edge marker (891.25 MHz).
Adjust C69, if necessary.

Step 7 UHF R-F Alignment

Retain connections used for step 6 and:
Adjust variable tuning voltage and sweep generator to Channel 34 (see nominal tuning control voltage chart below).
Adjust trimmers C66, C67 and C68 for optimum response.
Adjust variable voltage and sweep generator to Channel 83.

Adjust trimmer C75 (relative to C49), and capacitor C55 (relative to CR 16), if necessary, for optimum response.
Tune from Channel 14 thru Channel 83 and observe response, readjust appropriate trimmers C66, C67, C69 and C75, if necessary, for best tracking and R-F response shape.

Step 8 Overall Response Check

Remove UHF alignment fixture from TP 6 and bypass from TP5. Connect 50 ohm detector from J2 to oscilloscope and check overall response. (See response curves Figure 54).

Note: If required L26 may be adjusted to provide maximum gain on channels 14 and 34 for the same setting of C67. Also, L26, may be positioned with respect to the bottom shield for best response on Channel 83.

If required, L25 may be adjusted to provide maximum gain on Channels 14 and 34 for the same setting of C66.
The adjustment of L26 and L25 for maximum gain may cause oscillation of Q5. If this occurs, slightly detune L26 and/or L25 as required.
The lead of CR 1 may be positioned with respect to C48 to adjust the response shape (apparent coupling) of the higher frequency channels.

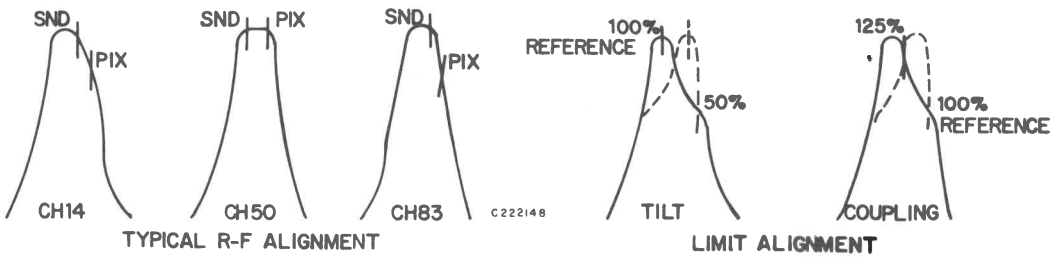
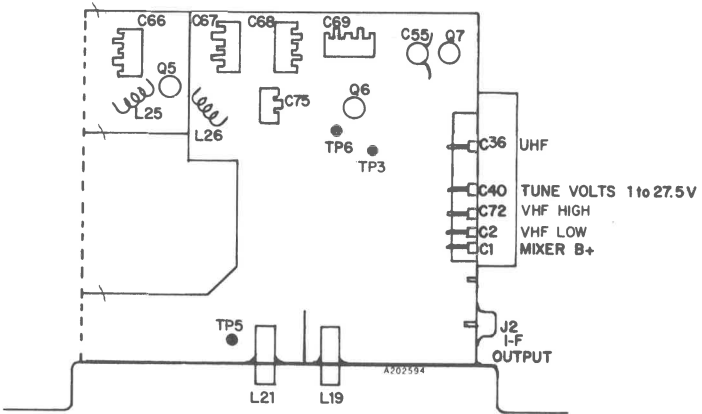


Fig. 54 — R-F Bandpass Characteristics and UHF Alignment Points

UHF NOMINAL TUNING CONTROL VOLTAGES AND PRESCALER CHANNEL FREQUENCIES								
Channel	14	24	34	43	53	63	73	83
Control Voltage	1.8V	3.8V	6.3V	8.4V	10.5V	13.5V	17.0V	24.0
Channel Freq. LO/K	2.02 MHz	2.25 MHz	2.48 MHz	2.69 MHz	2.93 MHz	3.16 MHz	3.40 MHz	3.63 MHz

The Remote Scan system includes the MCR 016RA Remote Receiver which utilizes Remote Decoder IC (U1101). This IC processes all information from the remote control unit. (CRK 28) via preamp (MCY 004), and sends appropriate signal voltages to the MSC control module. The Remote Receiver also processes volume up-down, on-off and channel up-down function commands from the manual pushbutton assembly located on the TV.

A separate power supply transformer (T1) located on the Remote Receiver Module assembly provides AC power (19 volts) to a full-wave bridge rectifier circuit. The filtered DC voltage is applied to a voltage divider stack and to regulator transistor Q1101 for standby and operational voltage for the Remote Receiver and Preamp Relay K1 provides on-off AC power to the TV chassis.

Symptom(s)

- 1. Unable To Set Time (Hours or Minutes) Erratic Display, Loss of Time display.
- 2. No Channel Up/Down — Remote
No Channel Up/Down — Manual Buttons
No Channel Up/Down (Remote or Manual)
- 3. No or Improper Volume Up/Down — Remote
No or Improper Up/Down — Manual Buttons
No or Improper Volume Up/Down + Remote or Manual
- 4. No Remote Control Action
- 5. No On-Off Action From Either Remote or Manual Buttons

Service Procedure

Use isolation transformer, disconnect line cord during all static checks, and use insulated clip leads for dynamic checks.

Preliminary: Check all interface connections and wiring to and from MSC control module, Remote Receiver MCR. Preamp MCY module, and other assemblies associated with this system.

- 1. Unable to Set Time (Hours or Minutes), Erratic Display, or Loss of Time Display

Display problems can be defined as a loss of erratic or distorted on screen digit display with otherwise normal operation. Such problems are usually confined to the clock and display IC (U2503) located on the MSC control module or to connector problems. If problems described above are encountered, replace the MSC module. A defective display IC may also cause instrument video problems. If video problems are suspected as being caused by the display system, remove connector P3-MSC and see if problem clears.

Failure of the system to maintain the correct time-of-day is a comparatively improbable situation without other symptoms being evident. If such a case is encountered:

- A. Check for possible intermittent power interruptions. If power to the instrument is interrupted the time-of-day display will be lost when power is restored — requiring the clock to be reset.
- B. Check the Time-Set switches and cabling for possible intermittents.
- 2. No Channel Up/Down — Remote (A)
No Channel Up/Down — Manual Button (B)
No Channel Up/Down + Remote or Manual (C)
 - A. Confirm good connections between remote module P1102-MCR and J1102-MCY. Monitor logic condition at points X and Y on the MSC module; should go low when channel button is depressed. If logic condition is "low"

at all times, problem may be defective component on Remote Receiver board Confirm presence of -11-volt DC to IC (U1101) and Preamp board MCY 004.

- B. If MSC responds to remote control channel up/down, but does not respond to manual up/down, check connections between P/J1103 as well as P1/J1 SVS.
- C. Check logic conditions at X and Y on MSC control module. If proper logic conditions are not available on MSC board, replace MCR Remote Receiver. If proper logic conditions are available on MSC and user does not get correct command function, replace MSC control module.
- 3. No or Improper Volume Up/Down — Remote (A)
No or Improper Volume Up/Down — Manual Buttons (B)
No or Improper Volume Up/Down — Remote or Manual (C)
 - A. Confirm good connections at J1101-MCR and P1101-MCR. If connections check out, replace MCR Remote Receiver.
 - B. Confirm good connections at J1103 and P1103/P1 & J1 SVC cable. If problem still exists, replace MCR Remote Receiver.
 - C. No or improper volume up/down in remote or manual operation usually indicates a problem associated with the Remote Decoder IC (U1101), or a problem associated within the TV sound section. First, monitor the DC voltage at point W on the MSC module; press the volume up/down buttons and confirm that DC voltage tracks when appropriate button is pressed. If voltage does not change — replace MCR module.

- 4. No Remote Control Action (Manual OK)

Problem like this will usually indicate defect in the CRK 28 transmitter, MCY Preamp.

- A. Check battery in transmitter.

- B. Confirm correct function command of transmitter CRK 28 by checking the input pins of U1001 on the PW 1000 circuit board. The voltage should be pulled down from approximately 9 volts to near zero when the associated button is depressed. Refer to the transmitter schematic for additional voltages.

A simple check to determine if the MCY module is working properly can be made by checking the voltage at U1101, pin 21 on MCR. In "off" mode, the voltage will be approximately -5.1 volts in the "On" mode, the voltage will be approximately +11 volts.

- C. Confirm presence of +11 volts DC on MCR module. If Manual volume operation works properly, Remote Decoder IC (U1101) is receiving +11 volts. A good place to confirm +11 volts is at point AA on the MSC module.
- D. Substitute the MCR module.

- 5. No On/Off Action From Either Remote or Manual Buttons

- A. Both manual and remote On/Off function are processed by Decoder U1101 on MCR module. Confirm presence of +11 volts DC on MCR. Check logic voltage at pin 21 of U1101 for toggle flip-flop action. If logic is "high" (+11V) Q1107 saturates energizing relay K1 which completes AC circuit to TV chassis. If logic is "low" (-5.1V), Q1107 is cut off and relay K1 de-energizes.
- B. On/Off problems are usually confined to defects on the MCR Remote Module. If problem is not resolved by substitution, then fault must be between J1MCR connector and AC input (PW AC/IN circuit board).

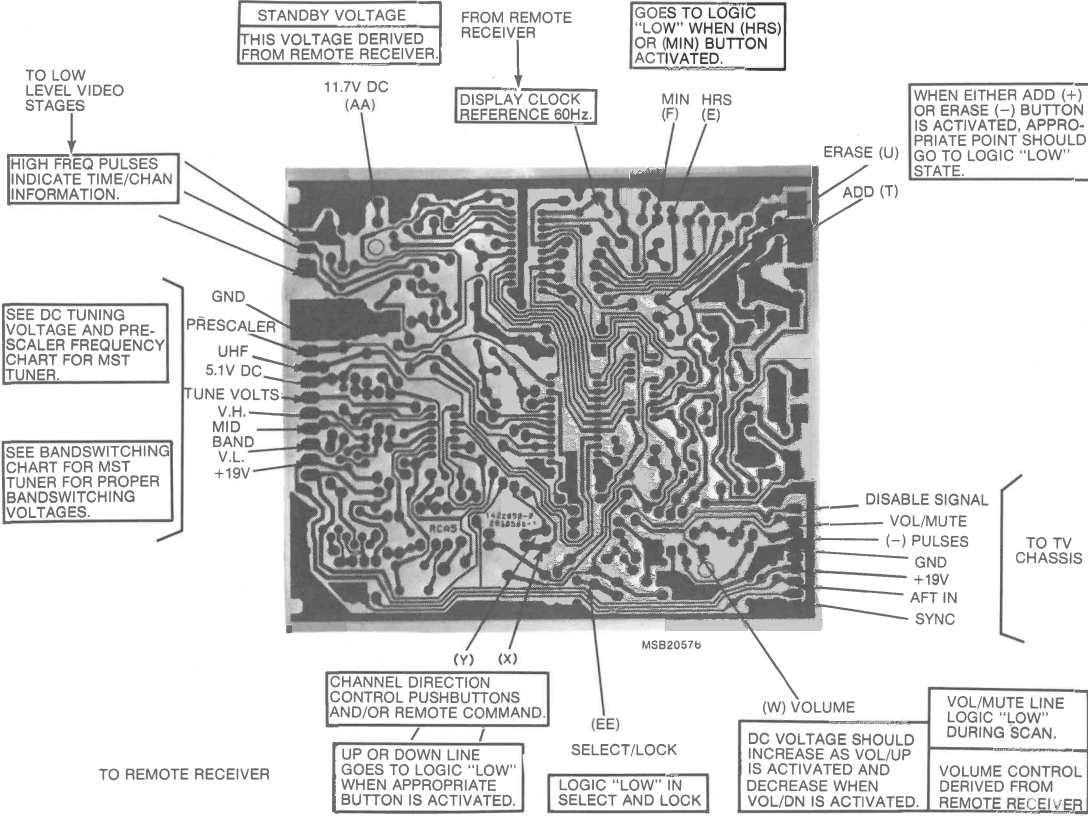


Fig. 55 — MSC013RA — Frequency Synthesis Control Module Circuit Board Bottom View

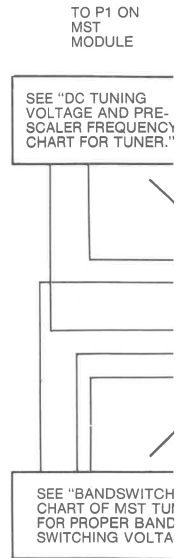
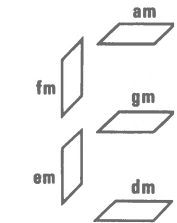
Since the MSC only the inputs at some operating voltage suggestions, the problem to problems related

Assumption is normally and the

Service Procedure

Use isolation static checks, and

Preliminary: Check from MSC control entered is a valid



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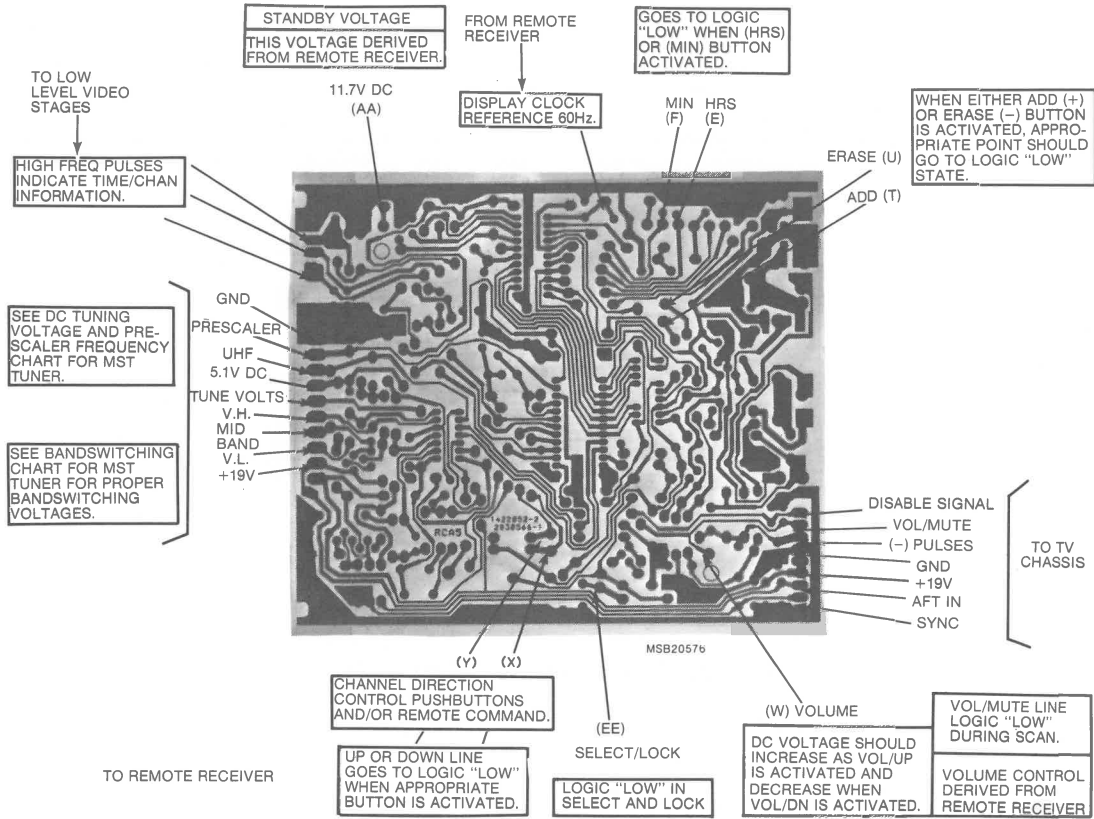


Fig. 55 — MSC013RA — Frequency Synthesis Control Module Circuit Board Bottom View

Since the MSC is a module, the isolation technique will look at only the inputs and outputs of the module with the exception of some operating voltages located on the module itself. The servicing suggestions presented should aid the technician in isolating the problem to either a module, connector, wiring, or other problems related solely to the MSC tuner control.

Assumption is made that the MST tuner module is operating normally and the I-F link cable is not defective.

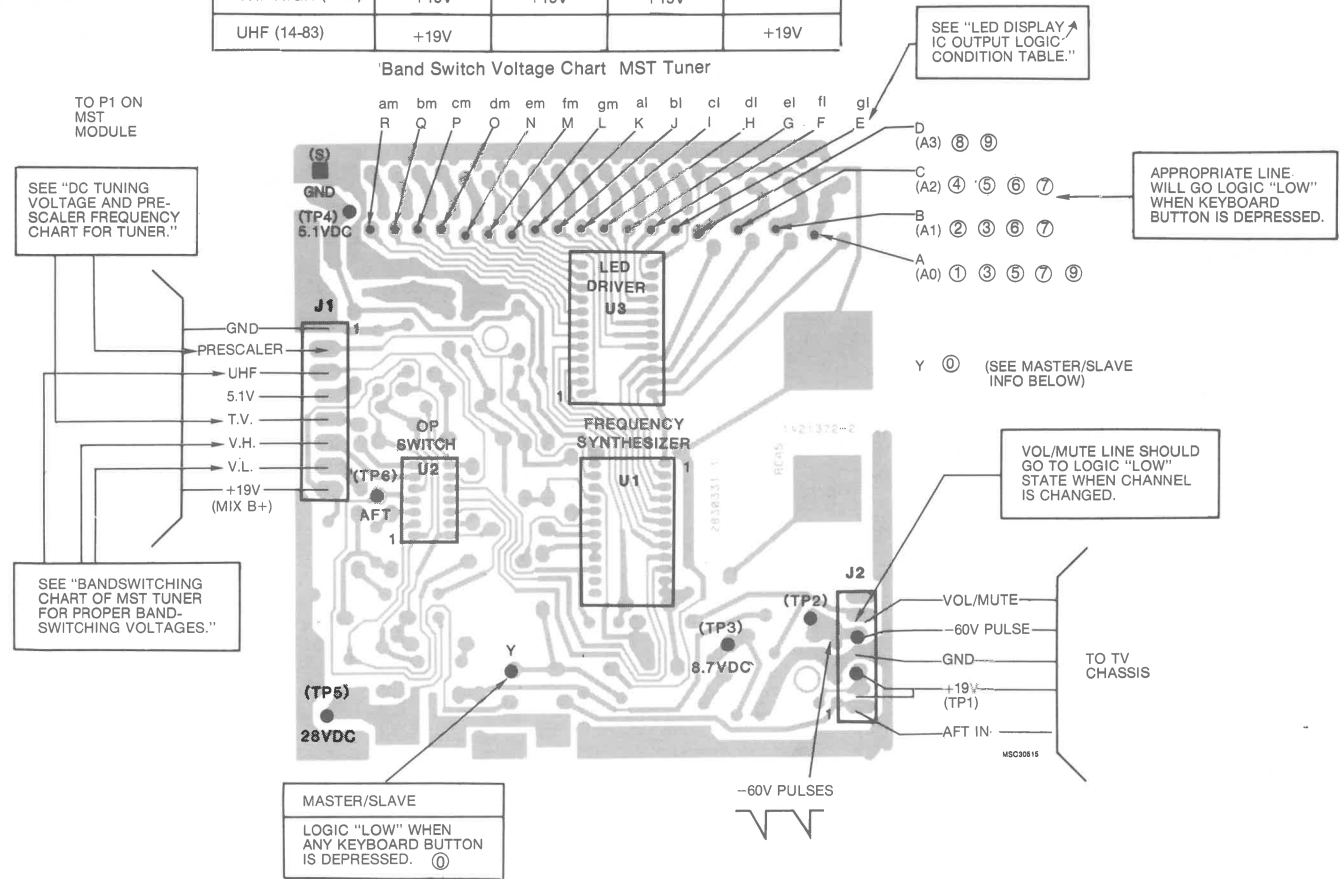
Service Procedure

Use isolation transformer, disconnect line cord during all static checks, and use insulated clip leads for dynamic checks.

Preliminary: Check all interface connections and wiring to and from MSC control module. Make sure that channel number entered is a valid entry. Each time channel entry is made note

LEFT DIGIT	LINES LOW (MSC BOARD)	RIGHT DIGIT	LINES LOW (MSC BOARD)
0	L,M,R,Q,P,O	0	E,J,I,H,G,F
1	M,R	1	F,G
2	L,M,N,P,Q	2	E,F,K,I,H
3	L,M,N,R,Q	3	E,F,K,G,H
4	O,N,M,R	4	J,K,F,G
5	L,O,N,R,Q,P	5	E,J,K,G,H
6	L,M,R	6	E,J,K,G,H,I
7	L,M,R,Q,P,O,N	7	E,F,G
8	L,M,R,Q,P,O,N	8	E,F,G,H,I,J,K
9	L,M,N,O,R	9	E,J,K,F,G
—	N	—	K

TV TUNING BAND	MIXER B+ (P1-8)	VHF LOW B+ (P1-7)	VHF HIGH B+ (P1-6)	UHF B+ (P1-3)
VHF LOW (2-6)	+19V	+19V		
VHF HIGH (7-13)	+19V	+19V	+19V	
UHF (14-83)	+19V			+19V



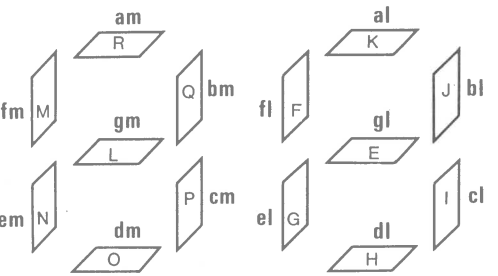
The MSC is a module and the isolation technique will look at only the inputs and outputs of the module with the exception of some operating voltages located on the module itself. The servicing suggestions presented should aid the technician in isolating the problem to either a module, connector, wiring, or other problems related solely to the MSC tuner control.

Assumption is made that the MST tuner module is operating normally and the I-F link cable is not defective.

Service Procedure

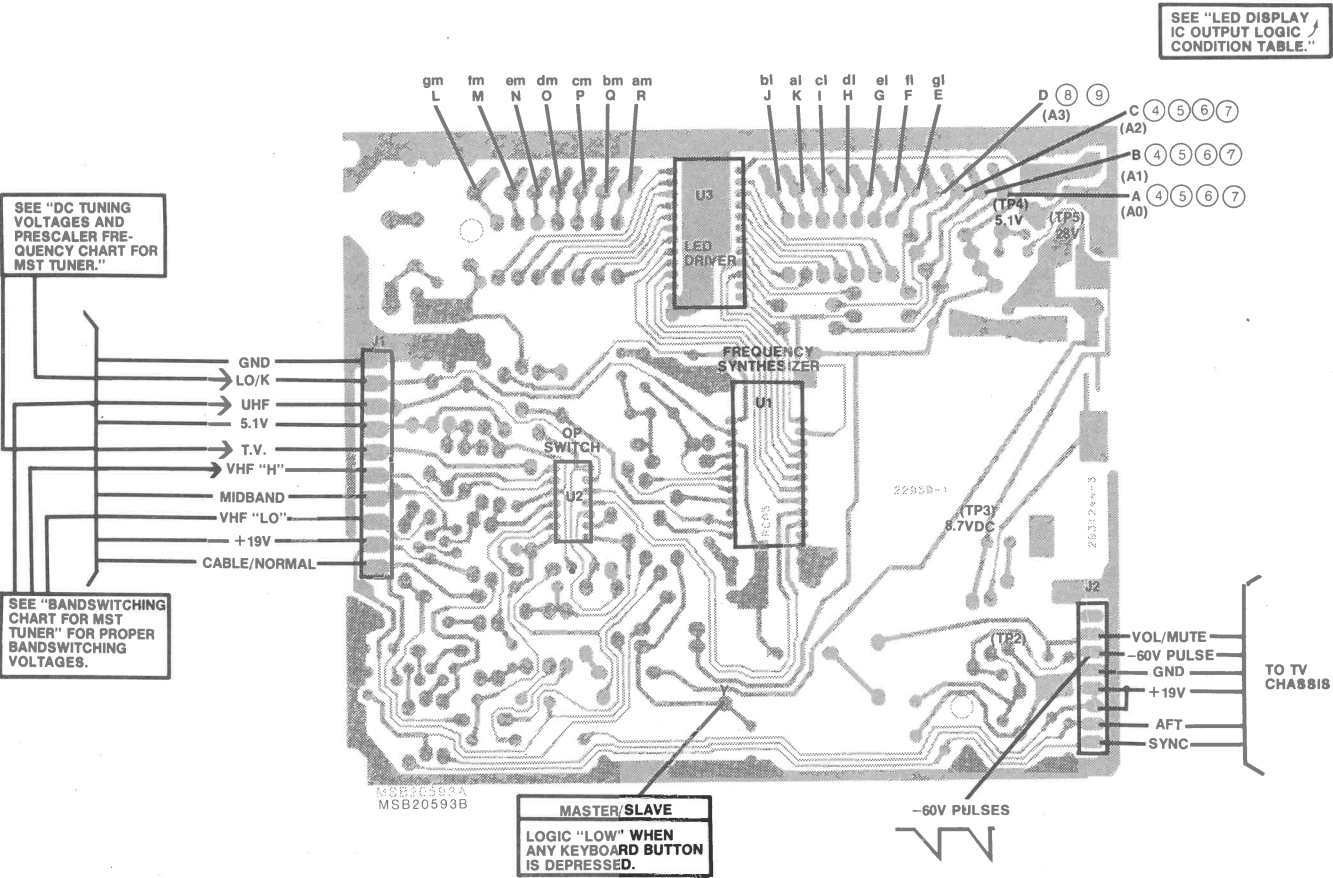
Use isolation transformer, disconnect line cord during all static checks, and use insulated clip leads for dynamic checks.

Preliminary: Check all interface connections and wiring to and from MSC control module. Make sure that channel number entered is a valid entry. Each time channel entry is made note display readout. This visual indication can prove to be a useful aid in tracking down a particular problem.



MSB 20583

LEFT DIGIT	LINES LOW (MSC BOARD)	RIGHT DIGIT	LINES LOW (MSC BOARD)
0	R,M,N,O,P,Q	0	K,F,G,H,I,J
1	Q,P	1	J,I
2	R,Q,L,N,O	2	K,J,E,G,H
3	R,Q,L,P,O	3	K,J,E,I,H
4	M,L,Q,P	4	F,E,J,I
5	R,M,L,P,O	5	K,F,E,I,H
6	R,M,N,O,P,L	6	K,F,G,H,I,E
7	R,Q,P	7	K,J,I
8	R,M,L,Q,N,O,P	8	K,F,E,J,G,H,I
9	L,M,R,Q,P,O	9	E,F,K,J,I,H
—	L	—	E



Modern circuit design/manufacturing techniques dictate a rather high component density on the printed circuit board utilized in this chassis. It naturally follows that the area available for "printing" copper patterns is also restricted. To maintain high reliability and safety standards, the printed circuit boards are manufactured under carefully controlled conditions and to extremely close tolerances. Some areas of the board are more critical than others due to spacing, pattern size, voltage/current requirements, etc. RCA has concluded, as a result of extensive

studies that less-than-optimum repair of copper patterns in these specific areas can degrade the reliability/safety of the instrument. The critical copper patterns are shown as "dark black" in the illustration (Figure 58). In the event printed circuit damage is evident in these designated areas (copper pattern broken, lifted, etc.) special soldering techniques are necessary to maintain reliability and safety standards. Contact your local RCA Consumer Electronics Distributor Service Manager before attempting copper pattern repair in the designated areas on the board layout.

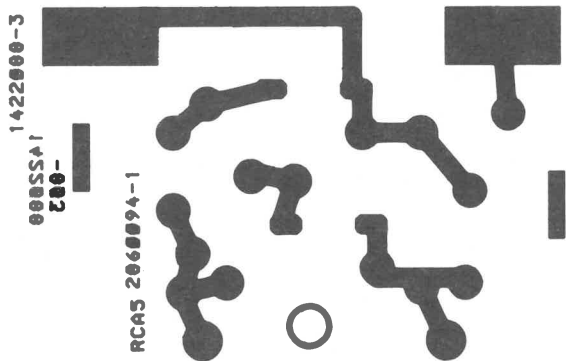


Fig. 58a — PW AC Circuit Board — Critical Copper Pattern

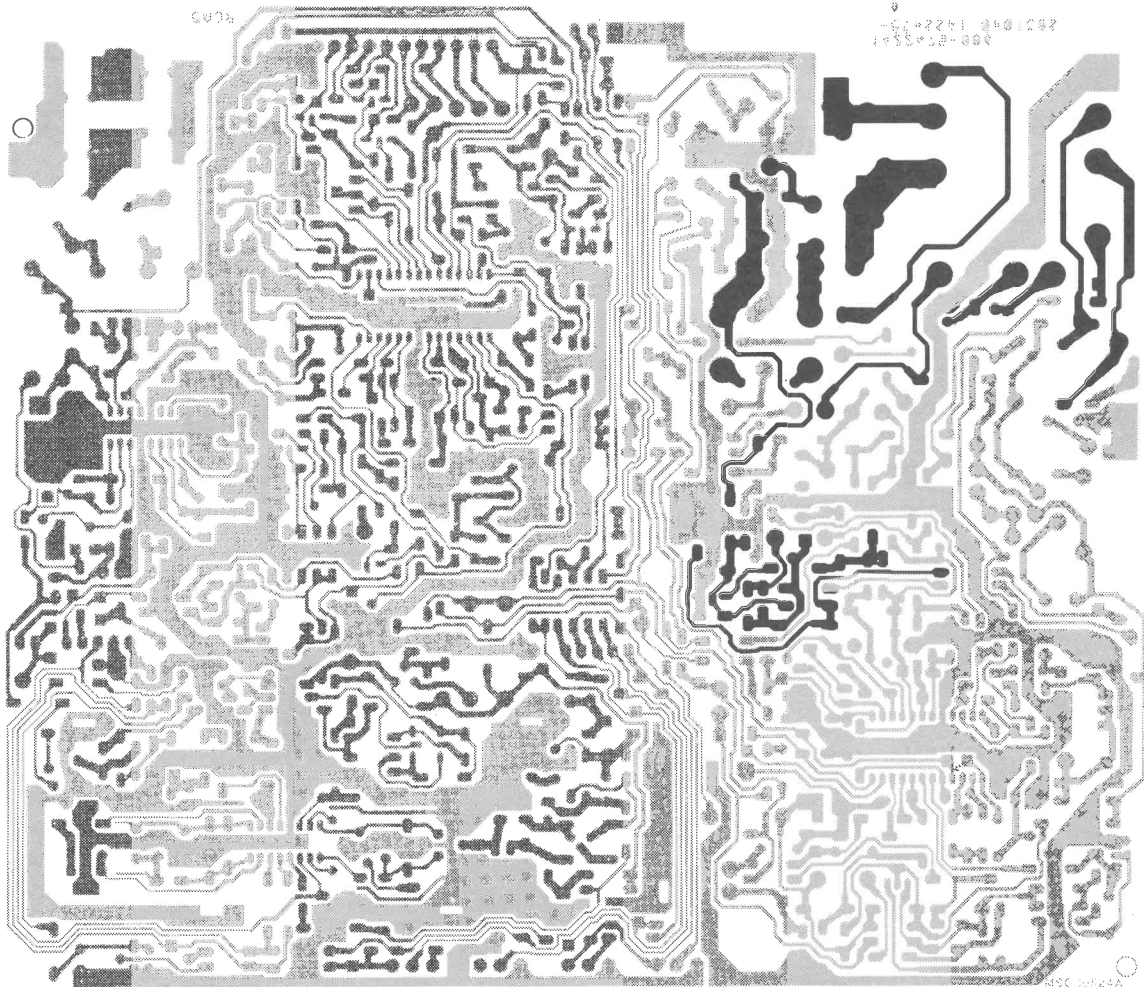


Fig. 58b — Main Chassis Circuit Board — Critical Copper Pattern

BEFORE REPLACING PARTS, READ THE FOLLOWING:

RCA-Approved Substitute Stock Numbers—Before ordering stock numbers in this parts list, look for an RCA-approved substitute stock number in the current *RCA Distributor & Special Products Price Schedule*. This will minimize your service time and avoid ordering parts you already have in stock.

See your RCA Distributor for Replacement Parts and Accessories.

Warranty Status of Assemblies and Parts—The warranty status of some assemblies and parts are indicated by one of the following Warranty Status Codes:

- Complete assembly not eligible for warranty exchange or replacement.
- † Eligible for warranty exchange for new or rebuilt unit.
- ‡ Complete assembly eligible for warranty replacement with new or rebuilt unit.

All parts listed without a Warranty Status Code symbol are eligible for warranty replacement as discrete components.

Warranty replacement of cabinet parts requires prior approval of RCA.

Warranty Status and Specifications of assemblies and parts are subject to change without notice.

PRODUCT SAFETY NOTE—Components marked with a (★) have special characteristics important to safety. Before replacing any of these components, read carefully the **PRODUCT SAFETY NOTICE** in the Basic Service Data. Do not degrade the safety of the set through improper servicing. Although assemblies as a whole may not be marked with a (★), replacement of RCA assemblies with other assemblies not RCA approved may result in a safety hazard.

Canada Stock Numbers:

Add prefix **64** to **Module** stock numbers.

Add prefix **70** to **Tuner** stock numbers.

Add prefix **62** to **all other** stock numbers.

.....AVOID REPLACEMENT PART ERRORS.....

File supplements and addendums immediately upon receipt, and consult the parts lists in them before ordering parts.

NOTE: For complete coverage of all parts and assemblies used in instruments equipped with the chassis series to which this service data relates, consult the following publications:

● **Basic Service Data**—Chassis and tuning systems and most related parts and assemblies that do not differ from one model or model group to another.

● **Service Data Supplements**—Cabinet, auxiliary, and other parts and assemblies that differ from one model group to another.

● **Service Data Addendum**—Any parts additions, deletions, or other changes made after initial production.

Do not replace or order parts without first consulting any Addendum(s) that may have been issued since publication of this service data.

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
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CHASSIS ASSEMBLY

CTC120A

C102	142699	1491927-015	★ CAPCD 680PF M Z5P 1KV
C103	142699	1491927-015	★ CAPCD 680PF M Z5P 1KV
C104	142699	1491927-015	★ CAPCD 680PF M Z5P 1KV
C105	153671	972187-074	★ CAP LYTC 600UF/30UF @ 200V
C106	141868	2841273-162	CAP LYTC 1UF N 50V
C107	155090	2841254-22M	CAPCD 1500PF K Z5P 50V
C108	146831	2841255-40R	CAPCD .022UF Z Z5V 50V
C109	147600	1466339-021	★ CAP POLY 1.5UF K 200V
C110	142699	1491927-015	★ CAPCD 680PF M Z5P 1KV
C111	148057	2841253-92M	CAPCD 1000PF K Z5P 50V
C112	143879	1491413-92M	CAPCD 1000PF K Z5P 50V
C113	104131	1490360-023	CAPCD 2700PF M Z5P 500V
C114	150872	1490360-026	CAPCD 1000PF M Z5P 500V
C115	156304	2840362-653	CAP LYTC 68UF M 35V
C116	142699	1491927-015	CAPCD 680PF M Z5P 1KV
C117	149726	1490136-52M	CAPCD .012UF K Z5P 250V
C118	147629	1491123-016	CAPCD .03UF Z Z5U 500V
C119	142699	1491927-015	CAPCD 680PF M Z5P 1KV
C120	141602	2840363-452	★ CAP LYTC 330UF N 35V
C201	141431	2840363-142	CAP LYTC 100UF N 25V
C202	141868	2841273-162	CAP LYTC 1UF N 50V
C203	143882	2841255-32M	CAPCD .01UF K Z5P 50V
C204	143882	2841255-32M	CAPCD .01UF K Z5P 50V
C205	143882	2841255-32M	CAPCD .01UF K Z5P 50V
C206	132443	1472442-021	CAP POLY .047UF M 100V
C208	142336	1490862-343	CAPCD 91PF J NPO 250V
C209	153976	2841262-011	CAPCD 7.5PF M NPO 250V
C210	143882	2841255-32M	CAPCD .01UF K Z5P 50V
C211	146217	2840363-651	CAP LYTC 680UF R 35V
C212	134939	2841255-50R	CAPCD .047UF Z Z5V 50V
C213	153969	2841251-66A	CAPCD 18PF F NPO 50V
C214	153974	1490862-363	CAPCD 130PF J NPO 250V
C301	148057	2841253-92M	CAPCD 1000PF K Z5P 50V
C302	103245	1490132-53A	CAPCD 12PF J NPO 250V
C303	150733	2841260-12M	CAPCD 1000PF K Z5P 250V
C304	153973	2841258-73A	CAPCD 100PF J Z5P 250V
C305	142768	2841261-40R	CAPCD .01UF Z Z5V 250V
C306	143879	1491413-92M	CAPCD 1000PF K Z5P 50V
C307	142768	2841261-40R	CAPCD .01UF Z Z5V 250V
C308	153971	2843253-627	CAPCD 9.1PF D NPO 250V
C309	153971	2843253-627	CAPCD 9.1PF D NPO 250V
C310	152331	1442134-069	CAP POLY .22UF K 75V
C311	150733	2841260-12M	CAPCD 1000PF K Z5P 250V
C312	153970	2841259-22M	CAPCD 220PF K Z5P 250V
C313	153970	2841259-22M	CAPCD 220PF K Z5P 250V
C314	150733	2841260-12M	CAPCD 1000PF K Z5P 250V
C315	150733	2841260-12M	CAPCD 1000PF K Z5P 250V
C316	145376	1490133-63A	CAPCD 82PF J NPO 250V
C317	142336	1490862-343	CAPCD 91PF J NPO 250V
C318	153969	2841251-66A	CAPCD 18PF F NPO 50V
C319	145382	2841258-32A	CAPCD 47PF K NPO 250V
C320	139444	1472442-025	CAP POLY .1UF M 100V
C321	154501	2841273-462	CAP LYTC 3.3UF N 50V

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
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C322	153970	2841259-22M	CAPCD 220PF K Z5P 250V
C323	147957	2841253-12M	CAPCD 220PF K Z5P 50V
C324	143860	2841254-62M	CAPCD 3300PF K Z5P 50V
C325	153970	2841259-22M	CAPCD 220PF K Z5P 250V
C326	143882	1491409-30M	CAPCD .01UF Z Z5P 50V
C327	153970	2841259-22M	CAPCD 220PF K Z5P 250V
C328	153967	2841274-632	CAP LYTC 68UF N 16V
C329	150733	2841260-12M	CAPCD 1000PF K Z5P 250V
C330	147536	2841253-42M	CAPCD 390PF K Z5P 50V
C331	142768	2841261-40R	CAPCD .01UF Z Z5V 250V
C333	147628	2843253-653	CAPCD 16PF J NPO 250V
C334	147864	2841253-82M	CAPCD 820PF K Z5P 50V
C335	150821	2841251-72A	CAPCD 22PF NPO K 50V
C401	146764	2841253-32M	CAPCD 330PF K Z5P 50V
C402	135048	1472442-067	CAP POLY .022UF K 200V
C403	146102	1472442-065	CAP POLY .015UF K 200V
C404	150738	2841254-32M	CAPCD 1800PF K Z5P 50V
C405	153234	1491123-029	CAPCD 220PF G NPO 250V
C406	153234	2813595-005	CAPCD 220PF G NPO 250V
C407	133535	1447121-009	CAP PROP 3900PF J 200V
C408	153991	2841274-343	★ CAP LYTC 22UF M 25V
C409	148057	2841253-92M	CAPCD 1000PF K Z5P 50V
C410	147957	1491413-12M	CAPCD 220PF K Z5P 50V
C411	153970	2841259-22M	CAPCD 220PF K Z5P 250V
C412	139444	1472442-025	★ CAP POLY .1UF M 100V
C413	141722	2841258-92M	CAPCD 150PF K Z5P 250V
C414	146256	2841274-143	CAP LYTC 10UF M 25V
C415	134778	1472442-069	CAP POLY .033UF K 100V
C416	147957	2841253-12M	CAPCD 220PF K Z5P 50V
C417	143755	2841257-93A	CAPCD 27PF J NPO 250V
C418	147955	2841259-82M	CAPCD 680PF K Z5P 250V
C419	154257	2871335-211	CAP POLY .047UF M 250V
C420	143882	2841255-32M	CAPCD .01UF K Z5P 50V
C421	143879	1491413-92M	CAPCD 1000PF K Z5P 50V
C423	151585	1466339-030	★ CAP PROP 9500PF G 1.2KV
C426	148057	2841253-92M	CAPCD 1000PF K Z5P 50V
C427	143550	2840362-553	CAP LYTC 47UF M 35V
C429	143881	2841254-42M	★ CAPCD 2200PF K Z5P 50V
C502	146083	1472442-079	CAP POLY .22UF K 75V
C503	146083	1472442-079	CAP POLY .22UF K 75V
C504	153993	2841258-12A	CAPCD 33PF K NPO 250V
C505	146212	2841274-152	CAP LYTC 10UF N 35V
C506	153992	1490001-022	CAP LYTC 3.3UF K 100V
C507	139441	1472442-063	CAP POLY .01UF K 200V
C508	147640	2840369-005	★ CAP LYTC 820UF M 25V
C509	147640	2840369-005	★ CAP LYTC 820UF M 25V
C510	148057	2841253-92M	CAPCD 1000PF K Z5P 50V
C511	143881	2841254-42M	CAPCD 2200PF K Z5P 50V
C701	146365	2841273-552	CAP LYTC 4.7UF N 35V
C703	146211	2841274-142	CAP LYTC 10UF N 25V
C704	143882	2841255-32M	CAPCD .01UF K Z5P 50V
C705	149774	1491916-733	CAPCD 75PF J NPO 50V
C706	153991	2841274-343	CAP LYTC 22UF M 25V
C707	139444	1472442-025	CAP POLY .1UF M 100V
C708	134939	2841255-50R	CAPCD .047UF Z Z5V 50V
C709	147624	2840362-542	CAP LYTC 47UF N 25V
C710	148057	2841253-92M	CAPCD 1000PF K Z5P 50V
C711	146439	1490001-020	CAP LYTC .47UF M 50V
C801	146833	2841251-93A	CAPCD 33PF J NPO 50V

IES LOW
C BOARD)

G,H,I,J

E,G,H

E,I,H

J,I

E,I,H

G,H,I,E

I

E,J,G,H,I

K,J,I,H

SEE "LED DISPLAY
IC OUTPUT LOGIC"
CONDITION TABLE."

(3)(6)(7)

(3)(6)(7)

(3)(6)(7)

MUTE
PULSE
ND
19V
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REPLACEMENT PARTS — 1983 CTC 120

Replacement Parts Continued (See Product Safety Note on first page of this parts list)

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION	SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
C803	146254	2841262-004	CAPCD 91PF J NPO 50V	P301	154512	1477018-533	CABLE ASSEMBLY
C805	148057	2841253-92M	CAPCD 1000PF K Z5P 50V	Q301	146848	1417405-002	TRANSISTOR IF INPUT A
C806	141868	2841273-162	CAP LYTC 1UF N 50V	Q303	146850	1417339-006	TRANSISTOR IF OUTPUT
C807	146439	1490001-020	CAP LYTC .47UF M 50V	Q304	146847	1417306-013	TRANSISTOR IF OUTPUT
C808	143882	2841255-32M	CAPCD .01UF K Z5P 50V	Q305	146850	1417339-006	TRANSISTOR SYNC SEPARATOR
C809	143882	2841255-32M	CAPCD .01UF K Z5P 50V	Q401	153677	1417321-003	TRANSISTOR HORIZ DRIVER
C810	143882	2841255-32M	CAPCD .01UF K Z5P 50V	Q402	148964	1417380-003	TRANSISTOR HORIZ OUTPUT
C811	143882	2841255-32M	CAPCD .01UF K Z5P 50V	Q501	146856	1417399-005	TRANSISTOR VERT OUTPUT
C812	141868	2841273-162	CAP LYTC 1UF N 50V	Q502	146856	1417399-005	TRANSISTOR VERT OUTPUT
C813	149774	1491916-733	CAPCD 75PF J NPO 50V	Q701	146847	1417306-013	TRANSISTOR PHASE COMP
C814	143874	2841252-83A	CAPCD 150PF J NPO 50V	Q703	143806	1417347-004	TRANSISTOR DRIVE REF
C815	143871	2841252-83A	CAPCD 100PF J NPO 50V	Q704	146847	1417306-013	TRANSISTOR RED BIAS
C816	150737	2841253-22M	CAPCD 270PF K Z5P 50V	Q705	146847	1417306-013	TRANSISTOR GREEN BIAS
C818	138701	1474578-010	CAPCTRIM 5-25PF	Q706	146847	1417306-013	TRANSISTOR BLUE BIAS
C819	149774	1491916-733	CAPCD 75PF J NPO 50V	Q801	146847	1417306-013	TRANSISTOR BURST/CLAMP
C820	143869	2841252-53A	CAPCD 82PF J NPO 50V	R102	830447	993273-461	* RES CFFP 1/2W 5% 470K
C821	148057	2841253-92M	CAPCD 1000PF K Z5P 50V	R106	153982	990696-522	* RES MF 1/4W 5% 100K
C822	153994	2841254-92M	CAPCD 5600PF K Z5P 50V	R108	153983	990696-402	* RES MF 1/2W 1% 10.2K
C823	145316	2841252-33A	CAPCD 56PF J NPO 50V	R109			* RES USE U401 DEF KIT
CR101	147993	2812851-001	DIODE	R110			* RES USE U401 DEF KIT
CR102	147993	2812851-001	DIODE	R111			* RES USE U401 DEF KIT
CR103	147993	2812851-001	DIODE	R112			* RES USE U401 DEF KIT
CR104	147993	2812851-001	DIODE	R113	115166	993261-035	RES WW 5W 10% 270R
CR105	147015	99203-203	DIODE	R114	830A47	993273-341	* RES CFFP 1/2W 5% 4.7R
CR106	153672	1476171-044	DIODE	R115	832336	1408729-262	RES MFFP 2W 5% 36K
CR107	142569	1476171-031	DIODE	R116	831168	993115-221	* RES MFFP 1W 5% 680R
CR301	149930	1477046-004	DIODE ZENER 12V	R119	143258	1447144-019	* RES WW 3W 5% 43R
CR302	119597	1471872-006	DIODE	R201	830012	993273-351	* RES CFFP 1/2W 5% 12R
CR401	143594	1476171-036	DIODE	R205	832027	946023-111	* RES WW 2W 5% 27R
CR402	139706	1471872-008	DIODE	R305	829110	993272-373	* RES CFFP 1/4W 5% 100R
CR405	139706	1471872-008	* DIODE	R306	829A82	993218-347	RES CF 1/4W 5% 8.2R
CR406	153673	1497049-001	* DIODE ZENER 24V	R314	829115	993218-679	RES CF 1/4W 2% 150K
CR407	157301	1471872-024	* DIODE	R321	829539	993218-483	RES CF 1/4W 5% 3.9M
CR408	139706	1471872-008	DIODE	R323	829516	993218-474	RES CF 1/4W 5% 1.6M
CR409	157301	1471872-024	* DIODE	R325	136358	945310-121	* RES WW 5W 5% 68R
CR410	147015	99203-206	DIODE	R332	148417	1473373-014	RES CONTROL AFT BALANCE
CR501	139706	1471872-008	DIODE	R333	148417	1473373-014	RES CONTROL AFT BALANCE
CR502	147015	99203-203	DIODE	R334	151297	1473373-062	RES CONTROL AGC
CR503	119597	1471872-006	DIODE	R402	831156	993115-219	* RES MFFP 1W 5% 560R
CR504	119597	1471872-010	DIODE	R403	151883	990401-443	RES MF 1/4W 1% 27.4K
CR505	137652	99203-201	DIODE	R404	154258	990401-490	RES MF 1/4W 1% 84.5K
CR507	139706	1471872-008	DIODE	R416	153978	990696-509	* RES MF 1/2W 1% 121K
CR701	119597	1471872-006	DIODE	R417	832310	1408729-249	RES MF 2W 5% 10K
CR703	119597	1471872-006	DIODE	R418	139154	946023-315	* RES WW 2W 5% .39R
CR704	119597	1471872-006	DIODE	R423	830256	993210-415	* RES CF 1/2W 5% 5600R
CR705	119597	1471872-006	DIODE	R425	829182	993218-395	* RES CF 1/4W 5% 820R
CR706	119597	1471872-006	DIODE	R426	147592	993261-167	* RES WW 5W 5% 5600R
CR707	119597	1471872-006	DIODE	R429	829110	993272-373	* RES CFFP 1/4W 5% 100R
DL701	153674	2860088-001	DELAY LINE	R430	148845	990696-442	* RES MF 1/2W 1% 26.7K
FB101	154052	2843165-001	BEAD	R431	829118	993218-379	* RES CF 1/4W 5% 180R
FB102	152102	2843117-001	BEAD	R433	832156	1408728-019	RES MF 2W 10% 560R
FB301	152102	2843117-001	BEAD	R502	829547	993218-485	RES CF 1/4W 5% 4.7M
FB302	152102	2843117-001	BEAD	R503	502533	993218-481	RES CF 1/4W 5% 3.3M
FB303	152103	2843117-002	BEAD	R509	830012	993273-351	* RES CFFP 1/2W 5% 12R
FB304	154052	2843165-001	BEAD	R511	829010	993218-349	* RES CF 1/4W 5% 10R
FB307	152102	2843117-001	BEAD	R513	829010	993272-349	* RES CFFP 1/4W 5% 10R
FB308	154052	2843165-001	BEAD	R514	829010	993272-349	* RES CFFP 1/4W 5% 10R
FB309	154042	2843117-005	BEAD	R518	145384	993273-325	* RES CFFP 1/2W 5% 1.0R
FB401	156475	2817416-001	BEAD	R715	148417	1473373-014	RES CONTROL CONTRAST
FB501	154052	2843165-001	BEAD	R726	829118	993272-379	* RES CFFP 1/4W 5% 180R
L103	152803	2872878-001	COIL 173UH	R727	831333	993115-261	* RES MFFP 1W 5% 33K
L104	153987	1497050-001	* COIL 68UH	R728	154259	990401-391	RES MF 1/4W 1% 8660R
L105	153986	1497050-002	* COIL 3.8UH	R745	830010	993273-349	* RES CFFP 1/2W 5% 10R
L201	143834	2861125-001	COIL 13.6UH	R805	154266	1473373-054	RES CONTROL CHROMA PEAKER
L202	153985	2861125-002	COIL 8.45UH	R4209	153681	1473368-003	* RES CONTROL SHARPNESS
L301	146198	1496289-010	COIL 1.01UH	RT101	149680	1477605-008	* THERMISTOR
L302	146200	1496289-012	COIL .79UH	SCR101	149251	1415780-004	SCR LATCH
L303	143899	1496289-006	COIL .160UH	SCR401	153682	1415781-004	* SCR REGULATOR
L304	143831	1467283-001	COIL .140UH	SF301	147639	2813509-001	SAW FILTER
L305	143893	2872884-012	COIL 2.2UH	T101	149266	2870941-002	TRANSFORMER REGULATOR
L307	147637	2872884-008	COIL 1UH	T301	154041	2861125-003	COIL ADJUSTMENT COIL
L308	143893	2872884-012	COIL 2.2UH	T401	153683	2870941-005	TRANSFORMER HORIZ DRIVE
L309	148420	2872884-007	COIL .82UH	T402	152770	1455865-501	* TRANSFORMER IHVT
L311	157133	2872884-022	COIL 15UH	T403	147641	2840497-501	* TRANSFORMER PIN
L312	154047	2872884-009	COIL 1.2UH	U201	153684	1485617-007	IC AUDIO
L313	154047	2872884-009	COIL 1.2UH	U301	146857	1421756-001	IC IF
L314	154048	2872884-014	COIL 3.3UH	U401	153875	2816796-100	* IC DEF KIT
L401	153984	2861125-004	COIL 1238UH	U701	153685	1465638-011	IC LUMA/CHROMA
L402	153986	1497050-002	COIL 3.8UH	Y801	105330	1107863-002	CRYSTAL 3.58MHZ
L701	154049	1496280-023	COIL 18UH		135767	1442505-004	CLIP, C105
L702	154049	1496280-023	COIL 18UH		151288	2841806-504	* CUP, ANODE AND LEAD ASSY
L801	149175	2841228-214	COIL 12UH		154215	1436948-014	* GROMMET, P301
L803	154050	2841228-220	COIL 39UH				
L804	154051	2841228-218	COIL 27UH				
L805	154051	2841228-218	COIL 27UH				
L806	154040	2841228-233	COIL 470UH				

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1983 CTC 120 — REPLACEMENT PARTS

Replacement Parts Continued (See Product Safety Note on first page of this parts list)

SYMBOL				STOCK				DRAWING				SYMBOL				STOCK				DRAWING				SYMBOL				STOCK			
NO.				NO.				NO.				NO.				NO.				NO.				NO.				NO.			
		155672	1442970-008	INSULATOR, Q402			C24003	134426	1442717-135	CAPCD 20PF K N750 100V			C24107	134430			C24107	134430													
		139301	1479290-001	RETAINER, BEAD CHAIN			C24004	134426	1442717-135	CAPCD 20PF K N750 100V			C24109	134430			C24109	134430													
		157521	1490104-004	RETAINER, WIRE			C24005	143027	1491123-001	CAPCD 82PF J N1500 250V			C24110	134430			C24110	134430													
		156478	1466388-005	SOCKET, Q402			C24006	147918	2870697-210	* CAPCD 600PF M Z5U 1.4KV			C24111	134430			C24111	134430													
		154397	2870460-001	SUPPORT, CABLE CLIP			C24007	150724	2870613-214	* CAPCD 1200PF Z5U 1.4KV			C24112	133853			C24112	133853													
							C24007	147918	2870697-210	* CAPCD 600PF M Z5U 1.4KV			C24113	145676			C24113	145676													
							C24008	150724	2870613-214	* CAPCD 1200PF Z5U 1.4KV			C24115	120832			C24115	120832													
							C24008	147918	2870697-210	* CAPCD 600PF M Z5U 1.4KV			C24116	142887			C24116	142887													
							C24009	150724	2870613-214	* CAPCD 1200PF Z5U 1.4KV			C24118	129977			C24118	129977													
							C24009	147918	2870697-210	* CAPCD 600PF M Z5U 1.4KV			C24119	139181			C24119	139181													
							C24010	129972	1442717-010	CAPCD 2.2PF C NPO 100V			C24120	143689			C24120	143689													
							C24011	119404	1442717-033	CAPCD 10PF J N470 100V			C24121	134423			C24121	134423													
							C24012	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V			C24122	134422			C24122	134422													
		156404	2844167-501	‡ CIRCUIT COMPLETE			C24013	134430	1442718-001	CAPCD 1000PF Z5U 100V			C24123	134423			C24123	134423													
							C24014	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V			C24124	134423			C24124	134423													
C1	154505	2840362-142	CAP LYTC 10UF N 25V				C24015	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V			C24125	134423			C24125	134423													
C2	146439	1490001-020	CAP LYTC .47UF M 50V				C24016	135168	1442717-052	CAPCD 6.8PF J N750 50V			C24126	134423			C24126	134423													
C3	143884	1491409-30R	CAPCD .01UF Z Z5V 50V				C24017	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V			C24127	134423			C24127	134423													
C4	143967	1491408-82M	CAPCD 4700PF K Z5P 50V				C24018	129977	1442718-008	CAPCD 470PF M Z5P 100V			C24128	134423			C24128	134423													
							C24019	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V			C24129	134423			C24129	134423													
							C24020	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V			C24130	134423			C24130	134423													
							C24021	129972	1442717-010	CAPCD 2.2PF C NPO 100V			C24131	143688			C24131	143688													
							C24023	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V			C24132	120832			C24132	120832													
FB1	152103	2843117-002	BEAD				C24024	125029	1442616-066	CAPCFT 20PF J N150 300V			C24133	134430			C24133	134430													
FB2	152103	2843117-002	BEAD				C24025	145382	1491123-007	CAPCD 47PF J N750 250V			C24134	134430			C24134	134430													
FB3	152102	2843117-001	BEAD				C24026	119406	1442717-006	CAPCD 4.7PF C NPO 100V			C24135	134430			C24135	134430													
							C24027	120832	945354-019	CAPCD 1000PF K Z5P 100V			C24136	119402			C24136	119402													
							C24028	120832	945354-019	CAPCD 1000PF K Z5P 100V			C24137	134437			C24137	134437													
							C24029	147832	1442717-058	CAPCD 2PF C NPO 100V			C24138	134430			C24138	134430													
							C24030	125022	1442717-061	CAPCD 3.3PF C N470 100V			C24140	134430			C24140	134430													
							C24031	120832	945354-019	CAPCD 1000PF K Z5P 100V			C24146	147918			C24146	147918													
							C24032	133632	1442717-056	CAPCD 4.7PF C N1500 100V			C24147	134437			C24147	134437													
							C24033	103968	942454-127	CAPHL .82PF J Z5C 500V			C24148	134430			C24148	134430													
							C24034	151542	1442717-063	CAPCD 6.8PF J NPO 100V			C24149	139181			C24149	139181													
							C24035	151543	2841242-423	CAPCD 220PF J NPO 50V			C24150	134430			C24150	134430													
							C24036	120832	945354-019	CAPCD 1000PF K Z5P 100V			C24151	134430			C24151	134430													
							C24037	150730	2841239-001	CAPCD 240PF J NPO 50V			C24152	134430			C24152	134430													
							C24038	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V																					
							C24039	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V																					
							C24040	145676	2841241-483	CAPCD 68PF J NPO 50V																					
							C24041	142878	1479267-002	CAPCTRAP 47PF J N1500 100V																					
							C24042	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V																					
							C24043	142879	1479267-004	CAPCTRAP 4.7PF D NPO 100V																					
							C24044	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V																					
							C24045	142880	1479267-011	CAPCTRAP 3.3PF D P100 100V																					
							C24046	142881	1479267-003	CAPCTRAP 82PF K P4000 100V																					
							C24048	142882	1479267-010	CAPCTRAP 33PF J N1500 100V																					
							C24050	142883	1479267-007	CAPCTRAP 20PF J N750 100V																					
							C24051	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V																					
							C24052	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V																					
							C24053	142884	1479267-008	CAPCTRAP 27PF J N750 100V																					
							C24054	142885	1479267-005	CAPCTRAP 1.5PF J N750 100V																					
							C24055	129972	1442717-124	CAPCD 2.2PF C NPO 100V																					
							C24056	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V																					
							C24057	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V																					
							C24058	139181	1442717-027	CAPCD 5.6PF C NPO 100V																					
							C24059	119402	1442717-001	CAPCD 3.3PF C NPO 100V																					
							C24060	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V																					
							C24061	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V																					
							C24062	129977	1442718-008	CAPCD 470PF M Z5P 100V																					
							C24063	133556	1442717-112	CAPCD 33PF K N750 100V																					
							C24064	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V																					
							C24065	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V																					
							C24070	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V																					
							C24071	103133	1490132-73A	CAPCD 18PF J NPO 250V																					
							C24072	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V																					
							C24073	119404	1442717-033	CAPCD 10PF J N470 100V																					
							C24074	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V																					
							C24076	125034	1442717-118	CAPCD 11PF J N470 100V																					

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PARTITION	Replacement Parts Continued (See Product Safety Note on first page of this parts list)				Replacement Parts Continued (See Product Safety Note on first page of this parts list)			
	SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION	SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
PUT A JTPUT JTPUT SEPARATOR Z DRIVER Z OUTPUT OUTPUT OUTPUT E COMP E REF BIAS EN BIAS BIAS ST/CLAMP		155672	1442970-008	INSULATOR, Q402	C24003	134426	1442717-135	CAPCD 20PF K N750 100V
		139301	1479290-001	RETAINER, BEAD CHAIN	C24004	134426	1442717-135	CAPCD 20PF K N750 100V
		157521	1490104-004	RETAINER, WIRE	C24005	143027	1491123-001	CAPCD 82PF J N1500 250V
		156478	1466388-005	SOCKET, Q402	C24006	147918	2870697-210	* CAPCD 600PF M Z5U 1.4KV
		154397	2870460-001	SUPPORT, CABLE CLIP	C24007	150724	2870613-214	* CAPCD 1200PF Z5U 1.4KV
CIRCUIT BOARDS								
CHANNEL DISPLAY								
		156404	2844167-501	‡ CIRCUIT COMPLETE	C24007	147918	2870697-210	* CAPCD 600PF M Z5U 1.4KV
	C1	145405	2840362-142	CAP LYTC 10UF N 25V	C24008	150724	2870613-214	* CAPCD 1200PF Z5U 1.4KV
	C2	146439	1490001-020	CAP LYTC .47UF M 50V	C24008	147918	2870697-210	* CAPCD 600PF M Z5U 1.4KV
	C3	143884	1491409-30R	CAPCD .01UF Z Z5V 50V	C24009	150724	2870613-214	* CAPCD 1200PF Z5U 1.4KV
	C4	143967	1491408-82M	CAPCD 4700PF K Z5P 50V	C24009	147918	2870697-210	* CAPCD 600PF M Z5U 1.4KV
	CR1	119597	1471872-006	DIODE	C24010	129972	1442717-010	CAPCD 2.2PF C NPO 100V
	CR2	119597	1471872-006	DIODE	C24011	119404	1442717-033	CAPCD 10PF J N470 100V
	FB1	152103	2843117-002	BEAD	C24012	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
	FB2	152103	2843117-002	BEAD	C24013	134430	1442718-001	CAPCD 1000PF Z5U 100V
	FB3	152102	2843117-001	BEAD	C24014	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
	Q1	143806	1417347-004	TRANSISTOR	C24015	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
KINE SOCKET ASSEMBLY								
	5000	154444	1458854-510	‡ CIRCUIT COMPLETE	C24016	135168	1442717-052	CAPCD 6.8PF J N750 50V
	C5001	142698	1441585-010	CAPCD .01UF M Z5U 2000V	C24017	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
	C5002	77953	1420198-015	CAPCD 2200PF Z Z5U 500V	C24018	129977	1442718-008	CAPCD 470PF M Z5P 100V
	L5001	157307	2841228-228	COIL 180UH	C24019	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
	Q5001	153680	1417362-007	TRANSISTOR RED DRIVER	C24020	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
	Q5002	153680	1417362-007	TRANSISTOR GREEN DRIVER	C24021	129972	1442717-010	CAPCD 2.2PF C NPO 100V
	Q5003	153680	1417362-007	TRANSISTOR BLUE DRIVER	C24023	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
	R5001	832310	1408729-249	* RES MF 2W 5% 10K	C24024	125029	1442616-066	CAPCFT 20PF J N150 300V
	R5002	832310	1408729-249	* RES MF 2W 5% 10K	C24025	145382	1491123-007	CAPCD 47PF J N750 250V
	R5003	832310	1408729-249	* RES MF 2W 5% 10K	C24026	119406	1442717-006	CAPCD 4.7PF C NPO 100V
	R5007	502410	983153-088	RES CC 1/2W 10% 1M	C24027	120832	945354-019	CAPCD 1000PF K Z5P 100V
	R5008	829315	983272-425	* RES CFFP 1/4W 5% 15K	C24028	120832	945354-019	CAPCD 1000PF K Z5P 100V
	R5014	146040	946023-207	* RES WW 2W 10% .18R	C24029	147832	1442717-058	CAPCD 2PF C NPO 100V
		139301	1479290-001	RETAINER, BEAD CHAIN	C24030	125022	1442717-061	CAPCD 3.3PF C N470 100V
		156263	2860700-501	* SOCKET, KINE	C24031	120832	945354-019	CAPCD 1000PF K Z5P 100V
PW BIAS/DRIVE								
	BIAS/ DRIV	154445	1458756-505	● CIRCUIT COMPLETE	C24032	133632	1442717-056	CAPCD 4.7PF C N1500 100V
	R534	147618	1473373-025	RES CONTROL VERT SIZE	C24033	103968	942454-127	CAPHL .82PF J Z5C 500V
	R750	147617	1473373-024	RES CONTROL RED BIAS	C24034	151542	1442717-063	CAPCD 6.8PF J NPO 100V
	R752	147617	1473373-024	RES CONTROL GREEN BIAS	C24035	151543	2841242-423	CAPCD 220PF J NPO 50V
	R754	147617	1473373-024	RES CONTROL BLUE BIAS	C24036	120832	945354-019	CAPCD 1000PF K Z5P 100V
	R756	147619	1473373-029	RES CONTROL GREEN DRIVE	C24037	150730	2841239-001	CAPCD 240PF J NPO 50V
	R758	147616	1473373-023	RES CONTROL RED/BLUE DRIVE	C24038	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V
PWAC								
	PWAC	157131	1458784-501	● CIRCUIT COMPLETE	C24039	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V
	C101	145613	1491976-004	* CAP POLY .22UF M 600V	C24040	145676	2841241-483	CAPCD 68PF J NPO 50V
	R120	153664	2841249-002	* RES WW 10W 5% 3.9R	C24041	142878	1479267-002	CAPCTRAP 47PF J N1500 100V
TUNING SYSTEM ASSEMBLIES								
TUNER ASSEMBLIES								
MST007RF								
	MST 007RF	156537	2844415-503	MODULE COMPLETE	C24042	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V
	C24001	143027	1491123-001	CAPCD 82PF J N1500 250V	C24043	142879	1479267-004	CAPCTRAP 4.7PF D NPO 100V
	C24002	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	C24044	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V
Continued on next page								

Replacement Parts Continued (See Product Safety Note on first page of this parts list)

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION	SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
C24107	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	FB24031	152103	2843117-002	BEAD
C24109	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	FB24032	152103	2843117-002	BEAD
C24110	119402	1442717-001	CAPCD 3.3PF C NPO 100V	FB24034	152124	2843117-003	BEAD
C24111	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	FB24035	152124	2843117-003	BEAD
C24112	133853	942965-240	CAPCD 14PF D NPO 500V	FB24039	152124	2843117-003	BEAD
C24113	145676	1491406-43A	CAPCD 68PF J NPO 50V	FB24040	152124	2843117-003	BEAD
C24115	120832	945354-019	CAPCD 1000PF K Z5P 100V	FB24043	152103	2843117-002	BEAD
C24116	142887	1490529-002	CAP POLY .27UF K 100V				
C24118	129977	1442718-008	CAPCD 470PF M Z5P 100V	J24001	131222	1496154-001	CONNECTOR
C24119	139181	1442717-031	CAPCD 5.6PF J NPO 100V				
C24120	143689	1490529-009	CAP POLY .082UF K 100V	L24015	153393	2843295-001	COIL 12UH
C24121	134423	1442616-038	CAPCFT 1000PF P Z5U 300V	L24016	153393	2843295-001	COIL 12UH
C24122	134422	1442616-035	CAPCFT 27PF K N470 300V	L24017	153393	2843295-001	COIL 12UH
C24123	134423	1442616-038	CAPCFT 1000PF P Z5U 300V	L24021	119412	1442642-022	COIL 10UH
C24124	134423	1442616-038	CAPCFT 1000PF P Z5U 300V	L24052	150715	973969-033	COIL 1.8UH
C24125	134423	1442616-038	CAPCFT 1000PF P Z5U 300V	L24053	150714	973969-032	COIL .97UH
C24126	134423	1442616-038	CAPCFT 1000PF P Z5U 300V	L24055	153393	2843295-001	COIL 12UH
C24127	134423	1442616-038	CAPCFT 1000PF P Z5U 300V	L24058	153393	2843295-001	COIL 12UH
C24128	134423	1442616-038	CAPCFT 1000PF P Z5U 300V				
C24129	134423	1442616-038	CAPCFT 1000PF P Z5U 300V	P24001	150716	1466476-010	CONNECTOR
C24130	134423	1442616-038	CAPCFT 1000PF P Z5U 300V				
C24131	143688	1490001-010	CAP LYTC 33UF R 25V	Q24001	146521	2811975-001	TRANSISTOR RF AMP
C24132	120832	945354-019	CAPCD 1000PF K Z5P 100V	Q24002	141370	1417377-003	TRANSISTOR OSCILLATOR
C24133	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	Q24003	141370	1417377-003	TRANSISTOR OSCILLATOR
C24134	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	Q24004	148085	2814681-001	TRANSISTOR RF AMP
C24135	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	Q24005	146521	2811975-001	TRANSISTOR RF AMP
C24136	119402	1442717-001	CAPCD 3.3PF C NPO 100V	Q24006	151693	1417392-001	TRANSISTOR IF AMP
C24137	134437	1442717-040	CAPCD 1PF C NPO 100V	Q24007	151326	1417360-001	TRANSISTOR OSCILLATOR
C24138	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	Q24008	148085	2814681-001	TRANSISTOR ISOLATION AMP
C24140	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	Q24009	152500	2815513-001	TRANSISTOR MIXER/AMP
C24146	147918	2870697-210	* CAPCD 600PF M Z5U 1.4KV				
C24147	134437	1442717-140	CAPCD 1PF C NPO 100V	R24002	157308	2812886-007	* RES CC 1/2W 10% 3.9M
C24148	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	R24002	157839	2812886-012	* RES CC 1/2W 10% 1.8M
C24149	139181	1442717-027	CAPCD 5.6PF C NPO 100V	R24003	157308	2812886-007	* RES CC 1/2W 10% 3.9M
C24150	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	R24008	829522	993218-177	RES CF 1/4W 10% 2.2M
C24151	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	R24009	829412	993230-747	RES CF 1/4W 2% 120K
C24152	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	R24010	829416	993218-750	RES CF 1/4W 2% 160K
				R24011	829139	993218-687	RES CF 1/4W 2% 390R
CR24001	119662	1471922-001	DIODE	R24012	829215	993218-701	RES CF 1/4W 2% 1500R
CR24002	129095	1477022-002	DIODE	R24031	829412	993218-747	RES CF 1/4W 2% 120K
CR24005				R24032	829416	993218-750	RES CF 1/4W 2% 160K
THRU				R24033	829139	993230-687	RES CF 1/4W 2% 390R
CR24008	137780	2815555-001	DIODE MATCHED SET	R24034	829215	993230-701	RES CF 1/4W 2% 1500R
CR24009	119662	1471922-001	DIODE	R24039	829522	993218-177	RES CF 1/4W 10% 2.2M
CR24010	119597	1471872-006	DIODE	R24043	829139	993218-687	RES CF 1/4W 2% 390R
CR24011	119597	1471872-006	DIODE	R24044	829139	993218-687	RES CF 1/4W 2% 390R
CR24012	129095	1477022-002	DIODE	R24051	829215	993218-701	RES CF 1/4W 2% 1500R
CR24013				R24053	829522	993218-177	RES CF 1/4W 10% 2.2M
THRU				R24054	829412	993218-747	RES CF 1/4W 2% 120K
CR24016	137780	1477949-004	DIODE MATCHED SET	R24055	829416	993230-750	RES CF 1/4W 2% 160K
CR24017	129095	1477022-002	DIODE	R24057	829215	993230-701	RES CF 1/4W 2% 1500R
CR24018				R24058	829139	993218-687	RES CF 1/4W 2% 390R
THRU				R24065	829362	993218-740	RES CF 1/4W 2% 62K
CR24021	147943	2812833-001	DIODE MATCHED SET	R24066	829412	993218-747	RES CF 1/4W 2% 120K
CR24022	129095	1477022-002	DIODE	R24067	829139	993218-687	RES CF 1/4W 2% 390R
CR24023	147943	2812833-001	DIODE	R24068	829122	993218-681	RES CF 1/4W 2% 220R
CR24024	129095	1477022-002	DIODE	R24069	829143	993230-688	RES CF 1/4W 2% 430R
CR24025	129095	1477022-002	DIODE	R24070	829333	993218-733	RES CF 1/4W 2% 33K
CR24026	129095	1477022-002	DIODE	R24078	829433	993218-757	RES CF 1/4W 2% 330K
CR24027	129095	1477022-002	DIODE	R24088	157838	2812886-013	* RES CC 1/2W 10% 2.2M
CR24028	129095	1477022-002	DIODE				
CR24029	119597	1471872-006	DIODE	T24001	151544	2871391-001	TRANSFORMER
CR24030	129095	1477022-002	DIODE				
CR24031	129095	1477022-002	DIODE	U24001	143696	2811550-001	IC PRESCALER
CR24032	129095	1477022-002	DIODE				
CR24033	129095	1477022-002	DIODE				
CR24034	143690	1477046-014	DIODE ZENER 19V				
FB24001	150725	1443391-019	BEAD				
FB24002	150725	1443391-019	BEAD				
FB24003	150725	1443391-019	BEAD				
FB24004	150725	1443391-019	BEAD				
FB24005	152124	2843117-003	BEAD				
FB24006	152103	2843117-002	BEAD				
FB24008	152103	2843117-002	BEAD				
FB24009	152103	2843117-002	BEAD				
FB24010	152103	2843117-002	BEAD				
FB24011	152102	2843117-001	BEAD				
FB24012	152103	2843117-002	BEAD				
FB24013	152103	2843117-002	BEAD				
FB24014	152103	2843117-002	BEAD				
FB24015	152103	2843117-002	BEAD				
FB24016	152102	2843117-001	BEAD				
FB24017	152124	2843117-003	BEAD				
FB24019	152103	2843117-002	BEAD				
FB24020	152103	2843117-002	BEAD				
FB24023	152103	2843117-002	BEAD				
FB24024	152102	2843117-001	BEAD				
FB24026	152102	2843117-001	BEAD				
FB24028	152102	2843117-001	BEAD				
FB24030	152103	2843117-002	BEAD				

Replacement Parts Continued (See Product Safety Note on first page of this parts list)

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION	SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
C12	119402	1442717-001	CAPCD 3.3PF C NPO 100V	FB16	152102	2843117-001	BEAD
C13	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	FB17	152124	2843117-003	BEAD
C14	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	FB21	152102	2843117-001	BEAD
C15	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	FB22	152102	2843117-001	BEAD
C16	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	FB23	152102	2843117-001	BEAD
C17	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	FB24	152102	2843117-001	BEAD
C18	143853	1442717-163	CAPCD 6.8PF C NPO 100V	FB24001	150725	1443391-019	BEAD
C19	120832	945354-019	CAPCD 1000PF K Z5P 100V	FB24002	150725	1443391-019	BEAD
C20	119406	1442717-106	CAPCD 4.7PF C NPO 100V	FB24003	150725	1443391-019	BEAD
C21	145382	1491123-007	CAPCD 27PF J N750 250V	FB24004	150725	1443391-019	BEAD
C22	146322	1444707-018	CAPM 120PF J 100V	J2	131222	1496154-001	CONNECTOR
C23	120832	945354-019	CAPCD 1000PF K Z5P 100V	J24002	150722	2871835-001	★ CONNECTOR
C24	141868	1490304-162	CAP LYTC 1UF N 50V	L15	153393	2843295-001	COIL 12UH
C24	129972	1442717-160	CAPCD 22PF C NPO 100V	L16	153393	2843295-001	COIL 12UH
C25	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	L18	153393	2843295-001	COIL 12UH
C26	119406	1442717-106	CAPCD 4.7PF C NPO 100V	L19	157456	973969-035	COIL 1.12UH
C27	120832	945354-019	CAPCD 1000PF K Z5P 100V	L21	157455	973969-034	COIL .328UH
C28	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	P1	157150	2861608-304	CONNECTOR
C29	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	Q1	148085	2814681-001	TRANSISTOR VHF RF AMP
C30	103523	1442717-159	CAPCD 7PF R N330 100V	Q2	141370	1417377-003	TRANSISTOR VHF LOW
C32	125842	1442717-104	CAPCD 18PF D N150 500V	Q3	148968	2814682-001	TRANSISTOR VHF MIXER
C33	125032	1442717-149	CAPCD 27PF J N750 100V	Q4	153489	1417392-002	TRANSISTOR IF POST AMP
C34	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	Q5	146521	2811975-001	TRANSISTOR UHF RF AMP
C35	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	Q6	151693	1417392-001	TRANSISTOR UHF IF BUFFER
C36	14423	1442616-038	CAPCFT 1000PF P Z5U 300V	Q7	151326	1417360-001	TRANSISTOR UHF LOW
C38	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V	R3	829522	993230-177	RES CF 1/4W 10% 2.2M
C39	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V	R4	829522	993230-177	RES CF 1/4W 10% 2.2M
C40	134423	1442616-038	CAPCFT 1000PF P Z5U 300V	R7	829412	993230-747	RES CF 1/4W 5% 120K
C41	142878	1479267-002	CAPCTRAP 47PF J N1500 100V	R15	829512	993218-471	RES CF 1/4W 5% 1.2M
C42	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V	R16	829415	993230-749	RES CF 1/4W 2% 150K
C43	142879	1479267-004	CAPCTRAP 470PF N Z5P 100V	R33	829139	993230-687	RES CF 1/4W 2% 390R
C44	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V	R34	829215	993230-701	RES CF 1/4W 2% 1500R
C45	142880	1479267-011	CAPCTRAP 3.3PF D P100 100V	R39	829522	993218-177	RES CF 1/4W 10% 2.2M
C48	142882	1479267-010	CAPCTRAP 33PF J N1500 100V	R24002	157308	2812886-007	★ RES CC 1/2W 10% 3.9M
C50	142883	1479267-007	CAPCTRAP 20PF J N750 100V	R24003	157308	2812886-007	★ RES CC 1/2W 10% 3.9M
C51	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	R24080	157457	2812886-004	★ RES CC 1/2W 10% 3.3M
C53	146305	1479267-013	CAPCTRAP 25PF J N750 100V	T24002	131299	1466890-002	TRANSFORMER
C54	142885	1479267-005	CAPCTRAP 1.5PF J 100V	T24003	156398	2870614-501	★ BALUN
C55	129972	1442717-124	CAPCD 2.2PF C NPO 100V	T24006	147918	2870697-210	★ CAPCD 600PF M Z5U 1.4KV
C56	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V	C24007	150724	2870613-214	★ CAPCD 1200PF Z5U 1.4KV
C57	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V	C24008	150724	2870613-214	★ CAPCD 1200PF Z5U 1.4KV
C58	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	C24009	150724	2870613-214	★ CAPCD 1200PF Z5U 1.4KV
C59	120832	945354-019	CAPCD 1000PF K Z5P 100V	C24144	130197	1442717-029	CAPCD 3.9PF C N470 100V
C60	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	C24149	139181	1442717-027	CAPCD 5.6PF C NPO 100V
C62	142887	1490529-002	CAP POLY .27UF K 100V	CR1	119662	1471922-001	DIODE
C64	120832	945354-019	CAPCD 1000PF K Z5P 100V	CR2	143690	1477046-014	DIODE ZENER 19V
C65	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V	CR3			
C70	142887	1490529-002	CAP POLY .27UF K 100V	CR6	137780	1477949-004	DIODE MATCHED SET
C71	103133	1490132-73A	CAPCD 18PF J NPO 250V	CR7	129095	1477022-002	DIODE
C72	134423	1442616-038	CAPCFT 1000PF P Z5U 300V	CR8	129095	1477022-002	DIODE
C79	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	CR9	129095	1477022-002	DIODE
C85	134426	1442717-135	CAPCD 20PF K N750 100V	CR10	129095	1477022-002	DIODE
C86	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	CR11	129095	1477022-002	DIODE
C87	134426	1442717-135	CAPCD 20PF K N750 100V	CR12	119597	1471872-006	DIODE
C94	129977	1442718-008	CAPCD 470PF M Z5P 100V	CR13			
C95	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	CR16	137780	1477949-004	DIODE MATCHED SET
C96	142881	1479267-003	CAPCTRAP 82PF K N4000 100V	FB1	152103	2843117-002	BEAD
C24006	147918	2870697-210	★ CAPCD 600PF M Z5U 1.4KV	FB2	152102	2843117-001	BEAD
C24007	150724	2870613-214	★ CAPCD 1200PF Z5U 1.4KV	FB3	152102	2843117-001	BEAD
C24008	150724	2870613-214	★ CAPCD 1200PF Z5U 1.4KV	FB4	152103	2843117-002	BEAD
C24009	150724	2870613-214	★ CAPCD 1200PF Z5U 1.4KV	FB5	152124	2843117-003	BEAD
C24144	130197	1442717-029	CAPCD 3.9PF C N470 100V	FB6	152103	2843117-002	BEAD
C24149	139181	1442717-027	CAPCD 5.6PF C NPO 100V	FB7	152103	2843117-002	BEAD
CR1	119662	1471922-001	DIODE	FB8	152103	2843117-002	BEAD
CR3				FB9	152102	2843117-001	BEAD
THRU				FB10	152102	2843117-001	BEAD
CR6	137780	1477949-004	DIODE MATCHED SET	FB11	119971	1443391-002	BEAD
CR7	129095	1477022-002	DIODE	FB12	152103	2843117-002	BEAD
CR8	129095	1477022-002	DIODE	FB13	152103	2843117-002	BEAD
CR9	129095	1477022-002	DIODE	FB14	119971	1443391-002	BEAD
CR10	129095	1477022-002	DIODE	FB15	152103	2843117-002	BEAD
CR11	129095	1477022-002	DIODE	FB16	152102	2843117-001	BEAD
CR12	119597	1471872-006	DIODE	FB17	152124	2843117-003	BEAD
CR13				FB24001	150725	1443391-019	BEAD
THRU				FB24002	150725	1443391-019	BEAD
CR16	137780	1477949-004	DIODE MATCHED SET				
FB1	152103	2843117-002	BEAD				
FB2	152102	2843117-001	BEAD				
FB3	152102	2843117-001	BEAD				
FB4	152103	2843117-002	BEAD				
FB5	152124	2843117-003	BEAD				
FB6	152103	2843117-002	BEAD				
FB7	152103	2843117-002	BEAD				
FB8	152103	2843117-002	BEAD				
FB9	152102	2843117-001	BEAD				
FB10	152102	2843117-001	BEAD				
FB12	152103	2843117-002	BEAD				
FB13	152103	2843117-002	BEAD				
FB15	152103	2843117-002	BEAD				

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Replacement Parts Continued (See Product Safety Note on first page of this parts list)

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION	SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
C29	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	FB24003	150725	1443391-019	BEAD
C30	103523	1442717-159	CAPCD 7PF R N330 100V	FB24004	150725	1443391-019	BEAD
C32	125842	1442717-104	CAPCD 18PF D N150 500V				
C33	125032	1442717-149	CAPCD 27PF J N750 100V	J2	131222	1496154-001	CONNECTOR
C34	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	J24002	150722	2871835-001	* CONNECTOR
C35	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V				
C36	134423	1442616-038	CAPCFT 1000PF P Z5U 300V	L15	153393	2843295-001	COIL 12UH
C38	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V	L16	153393	2843295-001	COIL 12UH
C39	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V	L18	153393	2843295-001	COIL 12UH
C40	134423	1442616-038	CAPCFT 1000PF P Z5U 300V	L19	157456	973969-035	COIL 1.12UH
C41	142878	1479267-002	CAPCTRAP 47PF J N1500 100V	L21	157455	973969-034	COIL .328UH
C42	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V	L35	119412	1442642-022	COIL 10UH
C43	142879	1479267-004	CAPCTRAP 4.7PF D NPO 100V				
C44	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V	P1	143695	1438208-002	CONNECTOR
C45	142880	1479267-011	CAPCTRAP 3.3PF D P100 100V				
C48	142882	1479267-010	CAPCTRAP 33PF J N1500 100V	Q1	148085	2814681-001	TRANSISTOR VHF RF AMP
C50	142883	1479267-007	CAPCTRAP 20PF J N750 100V	Q2	141370	1417377-003	TRANSISTOR VHF LOW
C51	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	Q3	148968	2814682-001	TRANSISTOR VHF MIXER
C53	142884	1479267-008	CAPCTRAP 27PF J N750 100V	Q4	153489	1417392-002	TRANSISTOR IF POST AMP
C54	142885	1479267-005	CAPCTRAP 1.5PF J P100 100V	Q5	146521	2811975-001	TRANSISTOR UHF RF AMP
C55	124476	1442717-142	CAPCD 2.7PF C NPO 100V	Q6	151693	1417392-001	TRANSISTOR UHF IF BUFFER
C56	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V	Q7	151326	1417360-001	TRANSISTOR UHF LOW
C57	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V				
C58	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	R3	829522	993230-177	RES CF 1/4W 10% 2.2M
C59	120832	945354-019	CAPCD 1000PF K Z5P 100V	R4	829522	993230-177	RES CF 1/4W 10% 2.2M
C60	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	R7	829412	993230-747	RES CF 1/4W 2% 120K
C63	143688	1490001-010	CAP LYTC 33UF R 25V	R15	829512	993218-471	RES CF 1/4W 5% 1.2M
C64	120832	945354-019	CAPCD 1000PF K Z5P 100V	R16	829415	993230-749	RES CF 1/4W 2% 150K
C65	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V	R33	829139	993230-687	RES CF 1/4W 2% 390R
C70	142887	1490529-002	CAP POLY .27UF K 100V	R34	829215	993230-701	RES CF 1/4W 2% 1500R
C71	103133	1490132-73A	CAPCD 18PF J NPO 250V	R39	829522	993218-177	RES CF 1/4W 10% 2.2M
C72	134423	1442616-038	CAPCFT 1000PF P Z5U 300V	R24002	157308	2812886-007	* RES CC 1/2W 10% 3.9M
C76	125034	1442717-118	CAPCD 11PF J N470 100V	R24003	157308	2812886-007	* RES CC 1/2W 10% 3.9M
C77	119584	942454-068	CAPHL .51PF K Z5C 500V	R24080	157457	2812886-004	* RES CC 1/2W 10% 3.3M
C78	134437	1442717-140	CAPCD 1PF C NPO 100V				
C79	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	T24002	131299	1466890-002	TRANSFORMER
C80	116500	942454-123	CAPHL .82PF J Z5C 500V	T24003	156398	2870614-501	* BALUN
C81	129977	1442718-008	CAPCD 470PF M Z5P 100V				
C82	129977	1442718-008	CAPCD 470PF M Z5P 100V	U1	143696	2811550-001	IC PRESCALER
C83	134423	1442616-038	CAPCFT 1000PF P Z5U 300V				
C84	134422	1442616-035	CAPCFT 27PF K N470 300V		154520	2841853-503	* BLOCK, ANTENNA COMPLETE
C85	134426	1442717-135	CAPCD 20PF K N750 100V		157951	2830509-002	COVER, OUTER
C86	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V		114918	990327-128	NUT, CONTROL MTG
C87	134426	1442717-135	CAPCD 20PF K N750 100V		113348	990300-012	RETAINER, SPRING J TYPE
C88	142768	1441023-071	CAPCD .01UF M Z5V 100V		157460	1491191-002	SPRING, BOTTOM COVER
C89	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V		157459	1491192-002	SPRING, TOP COVER
C90	133556	1442717-112	CAPCD 33PF K N750 100V		157458	1491194-002	SPRING, 'V' BOTTOM
C91	143689	1490529-009	CAP POLY .082UF K 100V				
C94	129977	1442718-008	CAPCD 470PF M Z5P 100V				
C95	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V				
C96	142881	1479267-003	CAPCTRAP 82PF K 100V				
C24006	147918	2870697-210	* CAPCD 600PF M Z5U 1.4KV				
C24007	150724	2870613-214	* CAPCD 1200PF Z5U 1.4KV				
C24008	150724	2870613-214	* CAPCD 1200PF Z5U 1.4KV				
C24009	150724	2870613-214	* CAPCD 1200PF Z5U 1.4KV				
C24144	130197	1442717-029	CAPCD 3.9PF C N470 100V	MSC			
C24149	139181	1442717-027	CAPCD 5.6PF C NPO 100V	006A			
CR1	119662	1471922-001	DIODE	REVC	149449	2840522-503	‡ MODULE COMPLETE
CR2	143690	1477046-014	DIODE ZENER 19V				
CR3							
THRU							
CR6	137780	1477949-004	DIODE MATCHED SET	C1	154510	945354-002	CAPCD .01UF P Z5U 500V
CR7	129095	1477022-002	DIODE	C2501	142768	1441023-121	CAPCD .01UF M Z5V 100V
CR8	129095	1477022-002	DIODE	C2502	147635	1491916-363	CAPCD 130PF J NPO 50V
CR9	129095	1477022-002	DIODE	C2503	147630	1491123-017	CAPCD 36PF G NPO 250V
CR10	129095	1477022-002	DIODE	C2505	148870	993286-085	CAP POLY .68UF K 100V
CR11	129095	1477022-002	DIODE	C2506	146083	1472442-079	CAP POLY .22UF K 75V
CR12	119597	1471872-006	DIODE	C2507	134778	1472442-069	CAP POLY .033UF K 100V
CR13				C2508	148871	1472442-056	CAP POLY .0027UF K 200V
THRU				C2509	143752	2840363-531	CAP LYTC 470UF R 16V
CR16	137780	1477949-004	DIODE MATCHED SET	C2511	143751	2840362-661	CAP LYTC 68UF R 50V
				C2512	143752	2840363-531	CAP LYTC 470UF R 16V
				C2514	146296	1449706-011	CAP POLY .015UF J 200V
				C2515	143759	1490135-11N	CAPCD 1000PF M Z5U 250V
				C2516	143759	1490135-11N	CAPCD 1000PF M Z5U 250V
				C2517	143759	1490135-11N	CAPCD 1000PF M Z5U 250V
				C2518	146209	2840361-643	CAP LYTC 6.8UF M 50V
				C2519	105300	1490133-72A	CAPCD 100PF K NPO 250V
				C2520	146297	1449706-010	CAP POLY .047UF J 200V
				C2524	132443	1472442-071	CAP POLY .047UF K 100V
				C2526	143752	2840363-531	CAP LYTC 470UF R 16V
				C2532	142768	1441023-121	CAPCD .01UF M Z5V 100V
				C2534	142768	1441023-121	CAPCD .01UF M Z5V 100V
				C2535	142768	1441023-121	CAPCD .01UF M Z5V 100V
				C2538	143759	1490135-11N	CAPCD 1000PF M Z5U 250V
				C2541	143759	1490135-11N	CAPCD 1000PF M Z5U 250V
				C2544	146185	1490134-40M	CAPCD 330PF Z Z5P 250V
				C2545	146185	1490134-40M	CAPCD 330PF Z Z5P 250V
				C2546	146185	1490134-40M	CAPCD 330PF Z Z5P 250V
				C2547	146185	1490134-40M	CAPCD 330PF Z Z5P 250V
				C2553	143759	1490135-11N	CAPCD 1000PF M Z5U 250V
				C2554	143759	1490135-11N	CAPCD 1000PF M Z5U 250V
				C2556	142768	1490136-41R	CAPCD .01UF M Z5V 250V
FB24001	150725	1443391-019	BEAD				
FB24002	150725	1443391-019	BEAD				

Replacement Parts Continued (See Product Safety Note on first page of this parts list)

DESCRIPTION	SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION	SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
	C29	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	FB24003	150725	1443391-019	BEAD
	C30	103523	1442717-159	CAPCD 7PF R N330 100V	FB24004	150725	1443391-019	BEAD
	C32	125842	1442717-104	CAPCD 18PF D N150 500V				
	C33	125032	1442717-149	CAPCD 27PF J N750 100V	J2	131222	1496154-001	CONNECTOR
	C34	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	J24002	150722	2871835-001	* CONNECTOR
	C35	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V				
	C36	134423	1442616-038	CAPCFT 1000PF P Z5U 300V	L15	153393	2843295-001	COIL 12UH
	C38	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V	L16	153393	2843295-001	COIL 12UH
	C39	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V	L18	153393	2843295-001	COIL 12UH
	C40	134423	1442616-038	CAPCFT 1000PF P Z5U 300V	L19	157456	973969-035	COIL 1.12UH
	C41	142878	1479267-002	CAPCTRAP 47PF J N1500 100V	L21	157455	973969-034	COIL .328UH
	C42	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V	L35	119412	1442642-022	COIL 10UH
	C43	142879	1479267-004	CAPCTRAP 4.7PF D NPO 100V				
	C44	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V	P1	143695	1438208-002	CONNECTOR
	C45	142880	1479267-011	CAPCTRAP 3.3PF D P100 100V				
	C48	142882	1479267-010	CAPCTRAP 33PF J N1500 100V	Q1	148085	2814681-001	TRANSISTOR VHF RF AMP
	C50	142883	1479267-007	CAPCTRAP 20PF J N750 100V	Q2	141370	1417377-003	TRANSISTOR VHF LOW
	C51	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	Q3	148968	2814682-001	TRANSISTOR VHF MIXER
	C53	142884	1479267-008	CAPCTRAP 27PF J N750 100V	Q4	153489	1417392-002	TRANSISTOR IF POST AMP
	C54	142885	1479267-005	CAPCTRAP 1.5PF J P100 100V	Q5	146521	2811975-001	TRANSISTOR UHF RF AMP
	C55	124476	1442717-142	CAPCD 2.7PF C NPO 100V	Q6	151693	1417392-001	TRANSISTOR UHF IF BUFFER
	C56	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V	Q7	151326	1417360-001	TRANSISTOR UHF LOW
IF RF AMP	C57	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V				
IF LOW	C58	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	R3	829522	993230-177	RES CF 1/4W 10% 2.2M
IF MIXER	C59	120832	945354-019	CAPCD 1000PF K Z5P 100V	R4	829522	993230-177	RES CF 1/4W 10% 2.2M
POST AMP	C60	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	R7	829412	993230-747	RES CF 1/4W 2% 120K
IF RF AMP	C63	143688	1490001-010	CAP LYTC 33UF R 25V	R15	829512	993218-471	RES CF 1/4W 5% 1.2M
IF IF AMP	C64	120832	945354-019	CAPCD 1000PF K Z5P 100V	R16	829415	993230-749	RES CF 1/4W 2% 150K
IF LOW	C65	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V	R33	829139	993230-687	RES CF 1/4W 2% 390R
	C70	142887	1490529-002	CAP POLY .27UF K 100V	R34	829215	993230-701	RES CF 1/4W 2% 1500R
% 2.2M	C71	103133	1490132-73A	CAPCD 18PF J NPO 250V	R39	829522	993218-177	RES CF 1/4W 10% 2.2M
% 2.2M	C72	134423	1442616-038	CAPCFT 1000PF P Z5U 300V	R24002	157308	2812886-007	* RES CC 1/2W 10% 3.9M
% 120K	C76	125034	1442717-118	CAPCD 11PF J N470 100V	R24003	157308	2812886-007	* RES CC 1/2W 10% 3.9M
% 1.2M	C77	119584	942454-068	CAPHL .51PF K Z5C 500V	R24080	157457	2812886-004	* RES CC 1/2W 10% 3.3M
% 150K	C78	134437	1442717-140	CAPCD 1PF C NPO 100V				
% 390R	C79	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V	T24002	131299	1466890-002	TRANSFORMER
% 1500R	C80	116500	942454-123	CAPHL .82PF J Z5C 500V	T24003	156398	2870614-501	* BALUN
% 2.2M	C81	129977	1442718-008	CAPCD 470PF M Z5P 100V				
% 3.9M	C82	129977	1442718-008	CAPCD 470PF M Z5P 100V	U1	143696	2811550-001	IC PRESCALER
% 3.9M	C83	134423	1442616-038	CAPCFT 1000PF P Z5U 300V				
% 3.3M	C84	134422	1442616-035	CAPCFT 27PF K N470 300V		154520	2841853-503	* BLOCK, ANTENNA COMPLETE
	C85	134426	1442717-135	CAPCD 20PF K N750 100V		157951	2830509-002	COVER, OUTER
	C86	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V		114918	990327-128	NUT, CONTROL MTG
	C87	134426	1442717-135	CAPCD 20PF K N750 100V		113348	990300-012	RETAINER, SPRING J TYPE
	C88	142768	1441023-071	CAPCD .01UF M Z5V 100V		157460	1491191-002	SPRING, BOTTOM COVER
A COMPLETE	C89	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V		157459	1491192-002	SPRING, TOP COVER
	C90	133556	1442717-112	CAPCD 33PF K N750 100V		157458	1491194-002	SPRING, 'V' BOTTOM
	C91	143689	1490529-009	CAP POLY .082UF K 100V				
MTG	C94	129977	1442718-008	CAPCD 470PF M Z5P 100V				
NG J TYPE	C95	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V				
TOM	C96	142881	1479267-003	CAPCTRAP 82PF K 100V				
M COVER LONG	C24006	147918	2870697-210	* CAPCD 600PF M Z5U 1.4KV				
	C24007	150724	2870613-214	* CAPCD 1200PF Z5U 1.4KV				
M COVER SHORT	C24008	150724	2870613-214	* CAPCD 1200PF Z5U 1.4KV				
	C24009	150724	2870613-214	* CAPCD 1200PF Z5U 1.4KV				
M COVER MED 'L'	C24144	130197	1442717-029	CAPCD 3.9PF C N470 100V				
VER	C24149	139181	1442717-027	CAPCD 5.6PF C NPO 100V	MSC			
NNA	CR1	119662	1471922-001	DIODE	006A			
	CR2	143690	1477046-014	DIODE ZENER 19V	REVC	149449	2840522-503	‡ MODULE COMPLETE
	CR3							
	THRU				C1	154510	945354-002	CAPCD .01UF P Z5U 500V
	CR6	137780	1477949-004	DIODE MATCHED SET	C2501	142768	1441023-121	CAPCD .01UF M Z5V 100V
	CR7	129095	1477022-002	DIODE	C2502	147635	1491916-363	CAPCD 130PF J NPO 50V
	CR8	129095	1477022-002	DIODE	C2503	147630	1491123-017	CAPCD 36PF G NPO 250V
	CR9	129095	1477022-002	DIODE	C2505	148870	993286-085	CAP POLY .68UF K 100V
P Z5U 300V	CR10	129095	1477022-002	DIODE	C2506	146083	1472442-079	CAP POLY .22UF K 75V
P Z5U 300V	CR11	129095	1477022-002	DIODE	C2507	134778	1472442-069	CAP POLY .033UF K 100V
IMV Z5U 100V	CR12	119597	1471872-006	DIODE	C2508	148871	1472442-056	CAP POLY .0027UF K 200V
1500 250V	CR13				C2509	143752	2840363-531	CAP LYTC 470UF R 16V
1500 250V	THRU				C2511	143751	2840362-661	CAP LYTC 68UF R 50V
IMV Z5U 100V	CR16	137780	1477949-004	DIODE MATCHED SET	C2512	143752	2840363-531	CAP LYTC 470UF R 16V
IMV Z5U 100V					C2514	146296	1449706-011	CAP POLY .015UF J 200V
PO 100V					C2515	143759	1490135-11N	CAPCD 1000PF M Z5U 250V
750 100V	FB1	152103	2843117-002	BEAD	C2516	143759	1490135-11N	CAPCD 1000PF M Z5U 250V
IMV Z5U 100V	FB2	152102	2843117-001	BEAD	C2517	143759	1490135-11N	CAPCD 1000PF M Z5U 250V
'O 100V	FB3	152102	2843117-001	BEAD	C2518	146209	2840361-643	CAP LYTC 6.8UF M 50V
IMV Z5U 100V	FB4	152103	2843117-002	BEAD	C2519	105300	1490133-72A	CAPCD 100PF K NPO 250V
IMV Z5U 100V	FB5	152124	2843117-003	BEAD	C2520	146297	1449706-010	CAP POLY .047UF J 200V
IMV Z5U 100V	FB6	152103	2843117-002	BEAD	C2524	132443	1472442-071	CAP POLY .047UF K 100V
IMV Z5U 100V	FB7	152103	2843117-002	BEAD	C2526	143752	2840363-531	CAP LYTC 470UF R 16V
IMV Z5U 100V	FB8	152103	2843117-002	BEAD	C2532	142768	1441023-121	CAPCD .01UF M Z5V 100V
IPO 100V	FB9	152102	2843117-001	BEAD	C2534	142768	1441023-121	CAPCD .01UF M Z5V 100V
Z5P 100V	FB10	152102	2843117-001	BEAD	C2535	142768	1441023-121	CAPCD .01UF M Z5V 100V
IPO 100V	FB11	119971	1443391-002	BEAD	C2538	143759	1490135-11N	CAPCD 1000PF M Z5U 250V
750 250V	FB12	152103	2843117-002	BEAD	C2541	143759	1490135-11N	CAPCD 1000PF M Z5U 250V
10V	FB13	152103	2843117-002	BEAD	C2544	146185	1490134-40M	CAPCD 330PF Z Z5P 250V
Z5P 100V	FB14	119971	1443391-002	BEAD	C2545	146185	1490134-40M	CAPCD 330PF Z Z5P 250V
PO 100V	FB15	152103	2843117-002	BEAD	C2546	146185	1490134-40M	CAPCD 330PF Z Z5P 250V
MV Z5U 100V	FB16	152102	2843117-001	BEAD	C2547	146185	1490134-40M	CAPCD 330PF Z Z5P 250V
IPO 100V	FB17	152124	2843117-003	BEAD	C2553	143759	1490135-11N	CAPCD 1000PF M Z5U 250V
Z5P 100V	FB24001	150725	1443391-019	BEAD	C2554	143759	1490135-11N	CAPCD 1000PF M Z5U 250V
MV Z5U 100V	FB24002	150725	1443391-019	BEAD	C2556	142768	1490136-41R	CAPCD .01UF M Z5V 250V

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Replacement Parts Continued (See Product Safety Note on first page of this parts list)

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION	SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
C2558	143759	1490135-11N	CAPCD 1000PF M Z5U 250V	C2544	146764	1491407-30M	CAPCD 330PF Z Z5P 50V
C2559	143759	1490135-11N	CAPCD 1000PF M Z5U 250V	C2545	146764	1491407-30M	CAPCD 330PF Z Z5P 50V
C2561	143759	1490135-11N	CAPCD 1000PF M Z5U 250V	C2546	146764	1491407-30M	CAPCD 330PF Z Z5P 50V
C2562	143759	1490135-11N	CAPCD 1000PF M Z5U 250V	C2547	146764	1491407-30M	CAPCD 330PF Z Z5P 50V
C2563	143759	1490135-11N	CAPCD 1000PF M Z5U 250V	C2553	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2564	143759	1490135-11N	CAPCD 1000PF M Z5U 250V	C2554	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2565	143759	1490135-11N	CAPCD 1000PF M Z5U 250V	C2556	142768	1490136-41R	CAPCD .01UF M Z5V 250V
C2580	143759	1490135-11N	CAPCD 1000PF M Z5U 250V	C2558	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2581	143759	1490135-11N	CAPCD 1000PF M Z5U 250V	C2561	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2582	143759	1490135-11N	CAPCD 1000PF M Z5U 250V	C2562	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2583	143759	1490135-11N	CAPCD 1000PF M Z5U 250V	C2563	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2584	143759	1490135-11N	CAPCD 1000PF M Z5U 250V	C2564	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
				C2565	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
				C2580	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
CR1	147015	99203-208	DIODE	C2581	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
CR2501	139706	1471872-008	DIODE	C2582	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
CR2502	156313	2870486-002	DIODE ZENER 30V	C2583	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
CR2503	142569	1476171-031	DIODE	C2584	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
CR2504	149797	1477046-028	DIODE ZENER 5.1V	C2585	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
CR2505	139706	1471872-008	DIODE	C2586	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
CR2506	139706	1471872-008	DIODE	C2589	145169	2840362-423	CAP LYTC 33UF M 10V
CR2516	152329	99201-217	DIODE ZENER 11V				
CR2518	130047	99201-116	DIODE ZENER 10V	CR2501	139706	1471872-008	DIODE
CR2519	119597	1471872-006	DIODE	CR2502	156313	2870486-002	DIODE ZENER 30V
CR2522	119597	1471872-006	DIODE	CR2503	142569	1476171-031	DIODE
				CR2504	149797	1477046-028	DIODE ZENER 5.1V
FB2501	126875	1443391-005	BEAD	CR2505	139706	1471872-008	DIODE
FB2502	126875	1443391-005	BEAD	CR2506	139706	1471872-008	DIODE
				CR2510	119597	1471872-006	DIODE
J1MSC	152238	2860051-008	CONNECTOR	CR2511	147015	99203-208	DIODE
J2MSC	152237	2860056-303	CONNECTOR	CR2513	119597	1471872-006	DIODE
				CR2515	119597	1471872-006	DIODE
L2502	153411	1447018-012	COIL 1.8UH	CR2516	145817	99202-217	DIODE ZENER 11V
				CR2518	130047	99201-116	DIODE ZENER 10V
P102	151328	2870575-001	CONNECTOR	CR2519	119597	1471872-006	DIODE
P1BCD	157371	2861175-007	CONNECTOR	CR2520	119597	1471872-006	DIODE
P1LED	147805	1467740-081	CONNECTOR	CR2522	119597	1471872-006	DIODE
P2BCD	157825	1474632-004	CONNECTOR	CR2536	119597	1471872-010	DIODE
P2LED	147606	1467740-091	CONNECTOR	CR2540	119597	1471872-010	DIODE
R1	831282	993115-247	* RES MFFP 1W 5% 8200R	FB2501	153328	2843165-004	BEAD
R2501	145042	1447144-020	RES WW 2W 5% 6.6R	FB2502	153328	2843165-004	BEAD
R2502	141244	1420347-141	RES WW 3W 5% 470R				
R2503	829510	993218-469	RES CF 1/4W 5% 1M	J1MSC	151980	2860051-019	CONNECTOR
R2512	829320	993218-728	RES CF 1/4W 2% 20K	J2MSC	150700	2860056-301	CONNECTOR
R2513	829327	993218-731	RES CF 1/4W 2% 27K				
				L2502	153411	1447018-012	COIL 1.8UH
U2501	146416	1421714-002	IC FREQUENCY SYNTHESIS	L2511	146157	1447117-015	COIL 68UH
U2502	149870	1421716-002	IC OP AMP SWITCH				
U2503	143766	1421719-001	IC LED DRIVER	P102	151327	2870572-001	CONNECTOR
				P1BCD	154481	2860742-007	CONNECTOR
Y2501	143769	1107863-018	CRYSTAL	P1LED	147605	1467740-081	CONNECTOR
				P2BCD	157825	1474632-004	CONNECTOR
	110501	938321-006	CONTACT, FOR P2BCD	P2LED	147606	1467740-091	CONNECTOR
	143776	1467221-002	COVER, OUTER				
	139301	1479290-001	RETAINER, BEAD CHAIN	Q2503	153399	1417306-015	TRANSISTOR SYNC DETECT
	151327	2870572-001	TERMINAL, FOR P102	Q2507	153325	1417347-002	TRANSISTOR MID BAND
				Q2508	142190	1417330-001	TRANSISTOR MID BAND
				Q2510	145410	1417330-015	TRANSISTOR SYNC DETECT

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SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION	SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
C2575	142768	1490136-41R	CAPCD .01UF M Z5V 250V	U2502	149870	1421716-002	IC BAND SWITCH
C2577	148873	2840362-181	CAP LYTC 10UF R 100V	U2503	150704	1421720-006	IC DECODER
C2578	143884	1491409-30R	CAPCD .01UF Z Z5V 50V	U2504	148446	2843187-001	IC MEMORY
C2579	143884	1491409-30R	CAPCD .01UF Z Z5V 50V		110501	938321-006	CONTACT, P2BCD
C2586	143884	1491409-30R	CAPCD .01UF Z Z5V 50V		150698	2830548-002	COVER, BOTTOM
C2588	146272	2840362-333	CAP LYTC 22UF M 16V		150697	2830548-001	COVER, TOP
C2589	145169	2840362-423	CAP LYTC 33UF M 10V		139301	1479290-001	RETAINER, BEAD CHAIN
C2593	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V				
C2594	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V				
C2595	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V				
C2596	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V				
C2597	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V				
C2598	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V				
CR2501	139706	1471872-008	DIODE				
CR2502	156313	2870486-002	DIODE ZENER 30V				
CR2503	142569	1476171-031	DIODE				
CR2504	149797	1477046-028	DIODE ZENER 5.1V				
CR2505	139706	1471872-008	DIODE				
CR2506	139706	1471872-008	DIODE				
CR2507	152869	1471898-014	DIODE ZENER 35V				
CR2508	142569	1476171-031	DIODE				
CR2509	119597	1471872-006	DIODE				
CR2510	119597	1471872-006	DIODE				
CR2513	119597	1471872-006	DIODE				
CR2514	139706	1471872-008	DIODE				
CR2515	119597	1471872-006	DIODE				
CR2517	119597	1471872-006	DIODE				
CR2518	130047	99201-116	DIODE ZENER 10V				
CR2519	119597	1471872-006	DIODE				
CR2520	119597	1471872-006	DIODE				
CR2521	119597	1471872-006	DIODE				
CR2531	143595	1476179-005	DIODE				
CR2534	119597	1471872-006	DIODE				
CR2535	119597	1471872-006	DIODE				
CR2536	119597	1471872-010	DIODE				
CR2540	119597	1471872-010	DIODE				
CR2552	119597	1471872-006	DIODE				
CR2553	119597	1471872-006	DIODE				
CR2554	119597	1471872-006	DIODE				
CR2555	119597	1471872-006	DIODE				
FB2501	126875	1443391-005	BEAD				
FB2501	153328	2843165-004	BEAD				
FB2502	126875	1443391-005	BEAD				
FB2502	153328	2843165-004	BEAD				
FB2503	126875	1443391-005	BEAD				
FB2503	153328	2843165-004	BEAD				
J2501	151980	2860051-019	CONNECTOR				
J2502	150700	2860056-301	CONNECTOR				
J2503	150701	2860056-302	CONNECTOR				
L2503	156370	2872884-042	COIL 10UH				
L2504	156370	2872884-042	COIL 10UH				
L2505	150702	2872884-016	COIL 4.7UH				
L2508	156370	2872884-042	COIL 10UH				</

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SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION	SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
C12	143882	1491409-32M	CAPCD .01UF K Z5P 50V	CR1129	119597	1471872-006	DIODE
C13	143879	1491407-92M	CAPCD 1000PF K Z5P 50V	CR1130	119597	1471872-006	DIODE
C14	143879	1491407-92M	CAPCD 1000PF K Z5P 50V	CR1131	119597	1471872-006	DIODE
C15	150710	1472442-001	CAP POLY1000PF M 200V	CR1132	119597	1471872-006	DIODE
C16	150710	1472442-001	CAP POLY1000PF M 200V	CR1134	148531	1471898-013	DIODE ZENER 9.1V
C17	143879	1491407-92M	CAPCD 1000PF K Z5P 50V	CR1135	119597	1471872-006	DIODE
C18	143879	1491407-92M	CAPCD 1000PF K Z5P 50V	CR1141	141429	99201-218	DIODE ZENER 12V
C19	141868	2840361-162	CAP LYTC 1UF N 50V				
C20	143879	1491407-92M	CAPCD 1000PF K Z5P 50V	FB1101	116761	1443391-101	BEAD
C21	143882	1491409-32M	CAPCD .01UF K Z5P 50V	K1	145163	1472787-012	★ RELAY
				P1MCR	118532	1461635-023	CONNECTOR 3 PIN
CR1	150711	2811592-003	DIODE	Q1102	141558	1417309-003	TRANSISTOR REMOTE AMP
CR2	119597	1471872-006	DIODE	Q1103	143802	1417330-010	TRANSISTOR POWER RESTORE
CR3	119597	1471872-006	DIODE	Q1104	146847	1417306-013	TRANSISTOR NAND GATE
CR5	119597	1471872-006	DIODE	Q1105	146847	1417306-013	TRANSISTOR NAND GATE
CR6	119597	1471872-006	DIODE	Q1106	143802	1417330-010	TRANSISTOR POWER RESTORE
				Q1107	146847	1417306-013	TRANSISTOR RELAY DRIVER
L1	150713	1445867-007	COIL 10MH	Q1108	145410	1417330-015	TRANSISTOR VOLUME REF
P106	154509	1467768-204	CONNECTOR	Q1111	146847	1417306-013	TRANSISTOR
P3MCR	157824	2860742-005	CONNECTOR	Q1112	146847	1417306-013	TRANSISTOR
				Q1113	146847	1417306-013	TRANSISTOR
Q1	133218	1417343-002	TRANSISTOR PREAMP	R1	134940	945310-133	★ RES WW 5W 5% 220R
Q2	133218	1417343-002	TRANSISTOR PREAMP	R1101	502510	1408776-082	RES CC 1/4W 10% 1M
Q3	145410	1417330-011	TRANSISTOR PREAMP	R1109	143849	1473373-009	RES CONTROL OSCILLATOR ADJ
Q4	119635	1417333-001	TRANSISTOR PREAMP	R1111	829215	993218-701	RES CF 1/4W 2% 1500R
Q5	156372	1417318-009	TRANSISTOR ON/OFF	R1112	829218	993218-703	RES CF 1/4W 2% 1.8K
Q6	146847	1417306-013	TRANSISTOR VOLUME	R1117	829510	993218-469	RES CF 1/4W 5% 1M
Q7	141343	1417330-004	TRANSISTOR VOL/EMITTER	R1121	830139	993290-215	★ RES MFFP1/2W 5% 390R
Q8	146847	1417306-013	TRANSISTOR ON/OFF INVERTER	R1122	829256	993218-715	RES CF 1/4W 2% 5600R
				R1124	829313	993218-724	RES CF 1/4W 2% 13K
R4	829510	993218-469	RES CF 1/4W 5% 1M	R1152	831A68	2816777-345	RES MFFP 1W 5% 6.8R
R13	829522	993218-477	RES CF 1/4W 5% 2.2M				
U1	152805	1421762-002	IC DECODER	T1	156324	1466469-006	★ TRANSFORMER POWER
Y1	145165	1422271-001	CRYSTAL	U1101	150706	1421768-001	IC REMOTE RECEIVER
	150707	1468955-001	COVER, PREAMP				
	150708	1468956-001	REFLECTOR, PHOTO DIODE		118414	1442877-201	TERMINAL MALE P1MCR
	139301	1479290-001	RETAINER, BEAD CHAIN				
MCR016RA				MCR017A REV 1			
MCR 016RA	149693	2840812-507	‡ MODULE COMPLETE	MCR 017A REV1	154500	1458780-508	‡ MODULE COMPLETE
C1101	143879	2840393-91M	CAPCT 1000PF M Z5P 50V	C1	143879	1491407-92M	CAPCD 1000PF K Z5P 50V
C1102	143879	2840393-91M	CAPCT 1000PF M Z5P 50V	C2	145405	2840362-142	CAP LYTC 10UF N 25V
C1103	143879	2840393-91M	CAPCT 1000PF M Z5P 50V	C3	141868	2840361-162	CAP LYTC 1UF N 50V
C1104	143879	2840393-91M	CAPCT 1000PF M Z5P 50V	C4	145405	2840362-142	CAP LYTC 10UF N 25V
C1105	145033	2871335-081	CAP POLY .33UF K 100V	C5	143882	1491409-32M	CAPCD .01UF K Z5P 50V
C1106	145171	1490303-151	★ CAP LYTC 1000UF R 35V	C6	139444	993286-075	CAP POLY .1UF K 100V
C1107	145316	2840392-33J	CAPCD 56PF J SL 50V	C7	150709	2841239-003	CAPCD 1800PF K NPO 50V
C1108	143879	2840393-91M	CAPCT 1000PF M Z5P 50V	C8	143879	1491407-92M	CAPCD 1000PF K Z5P 50V
C1109	143879	2840393-91M	CAPCT 1000PF M Z5P 50V	C9	139444	993286-075	CAP POLY .1UF K 100V
C1110	139444	2871335-075	CAP POLY .1UF K 100V	C11	148501	2840362-242	CAP LYTC 15UF N 25V
C1111	141868	2840361-163	CAP LYTC 1UF M 50V	C12	143882	1491409-32M	CAPCD .01UF K Z5P 50V
C1112	139444	1472442-075	CAP POLY .1UF K 100V	C13	143879	1491407-92M	CAPCD 1000PF K Z5P 50V
C1113	143867	2840392-22A	CAPCT 47PF K NPO 50V	C14	143879	1491407-92M	CAPCD 1000PF K Z5P 50V
C1114	147036	2840395-31N	CAPCD .010UF M Z5R 50V	C15	150710	1472442-001	CAP POLY1000PF M 200V
C1115	147036	2840395-31N	CAPCD .010UF M Z5R 50V	C16	150710	1472442-001	CAP POLY1000PF M 200V
C1116	146210	2840361-553	CAP LYTC 4.7UF M 35V	C17	143879	1491407-92M	CAPCD 1000PF K Z5P 50V
C1117	141868	2840361-163	CAP LYTC 1UF M 50V	C18	143879	1491407-92M	CAPCD 1000PF K Z5P 50V
C1118	143879	2840393-91M	CAPCT 1000PF M Z5P 50V	C19	141868	2840361-162	CAP LYTC 1UF N 50V
C1119	143879	2840393-91M	CAPCT 1000PF M Z5P 50V	C20	143879	1491407-92M	CAPCD 1000PF K Z5P 50V
C1120	143759	1490135-11N	CAPCD 1000PF M Z5U 250V	C21	143882	1491409-32M	CAPCD .01UF K Z5P 50V
C1121	143759	1490135-11N	CAPCD 1000PF M Z5U 250V				
CR1101	137652	99203-202	DIODE	CR1	150711	2811592-003	DIODE
CR1102	137652	99203-202	DIODE	CR2	119597	1471872-006	DIODE
CR1103	137652	99203-202	DIODE	CR3	119597	1471872-006	DIODE
CR1104	137652	99203-202	DIODE	CR5	119597	1471872-006	DIODE
CR1108	119597	1471872-006	DIODE	CR6	119597	1471872-006	DIODE
CR1109	119597	1471872-006	DIODE				
CR1110	148531	1471898-013	DIODE ZENER 9.1V	L1	150713	1445867-007	COIL 10MH
CR1114	150705	1477046-029	DIODE ZENER 5.1V				
CR1116	119597	1471872-006	DIODE	P106	154509	1467768-204	CONNECTOR
CR1117	119597	1471872-006	DIODE	P1SVS	154364	2860742-004	CONNECTOR
CR1118	119597	1471872-006	DIODE				
CR1119	119597	1471872-006	DIODE	Q1	133218	1417343-002	TRANSISTOR PREAMP
CR1120	139706	1471872-008	DIODE	Q2	133218	1417343-002	TRANSISTOR PREAMP
CR1121	139706	1471872-008	DIODE	Q3	145410	1417330-011	TRANSISTOR PREAMP
CR1122	119597	1471872-006	DIODE	Q4	119635	1417333-001	TRANSISTOR PREAMP
CR1124	119597	1471872-006	DIODE	Q5	156372	1417318-009	TRANSISTOR ON/OFF
CR1125	119597	1471872-006	DIODE	Q6	146847	1417306-013	TRANSISTOR VOLUME
CR1126	119597	1471872-006	DIODE	Q7	141343	1417330-004	TRANSISTOR VOLUME
CR1127	119597	1471872-006	DIODE	Q8	146847	1417306-013	TRANSISTOR ON/OFF INVERTER
CR1128	119597	1471872-006	DIODE				

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SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION	SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
Q8	146847	1417306-013	TRANSISTOR ON/OFF INVERTER	CR1004	147015	1474778-005	DIODE
				CR1007	119597	1471872-006	DIODE
R4	829510	993218-469	RES CF 1/4W 5% 1M	CR1009	148056	2811593-001	DIODE
R13	829522	993218-477	RES CF 1/4W 5% 2.2M	CR1011	148056	2811593-001	DIODE
S4201	155478	2841943-501	SWITCH ASSEMBLY	PW1000	151554	1458757-504	CIRCUIT, COMPLETE
U1	152805	1421762-002	IC DECODER	Q1005	145395	1417318-007	TRANSISTOR
Y1	145165	1422271-001	CRYSTAL				
	150707	1468955-001	COVER, PREAMP	R1004	829110	993218-373	RES CF 1/4W 5% 100R
	150708	1468956-001	REFLECTOR, PHOTO DIODE	R1009	829110	993218-373	RES CF 1/4W 5% 100R
	139301	1479290-001	RETAINER, BEAD CHAIN	R1010	829510	993218-469	RES CF 1/4W 5% 1M
				R1011	829227	993218-407	RES CF 1/4W 5% 2700R
MCY004A				U1001	151579	1421765-001	IC
				Y1001	148072	1422271-002	CRYSTAL
MCY 004A	146993	2840592-501	‡ MODULE COMPLETE		148049	1438354-001	CASE, BOTTOM
					154283	1438353-004	CASE, TOP
C901	143857	1491407-22M	CAPCD 270PF K Z5P 50V		168227	1466673-002	CONNECTOR, BATTERY
C903	143879	1491407-92M	CAPCD 1000PF K Z5P 50V		148046	2870620-001	CONNECTOR, BOARD
C904	147667	1491407-32J	CAPCD 330PF K SL 50V		148050	1467680-001	COVER, FRONT
C905	145315	1491408-52M	CAPCD 2700PF K Z5P 50V		148051	1467681-001	DOOR, BATTERY
C906	147861	1491406-22J	CAPCD 47PF K SL 50V		148880	284128-001	FOOT
C907	146211	2840362-141	CAP LYTC 10UF R 25V		148052	2830195-010	OVERLAY, KEYBOARD
C909	146211	2840362-141	CAP LYTC 10UF R 25V		148053	2842241-509	SWITCH, KEYBOARD
C910	141868	2840361-161	CAP LYTC 1UF R 50V	CRK33H			
C911	141868	2840361-161	CAP LYTC 1UF R 50V				
C912	141868	2840361-161	CAP LYTC 1UF R 50V		156516	1457635-507	TRANSMITTER, REMOTE
CR901	119597	1471872-006	DIODE	C1001	153341	2813595-006	CAPCD 920PF J NPO 100V
CR902	150711	2815416-001	DIODE PHOTO	C1002	143882	1491409-32M	CAPCD .01UF K Z5P 50V
CR904	119597	1471872-006	DIODE	C1003	145896	1491409-50R	CAPCD .047UF Z Z5V 50V
CR905	119597	1471872-006	DIODE				
CR906	119597	1471872-006	DIODE	CR1001	153342	2811593-002	DIODE LED
				CR1002	153342	2811593-002	DIODE LED
L901	148068	1445867-006	COIL 55MH	CR1004	119597	1471872-006	DIODE
Q901	148070	1417411-001	TRANSISTOR	P1001	148426	1466429-005	CONNECTOR BOARD
Q902	145410	1417330-011	TRANSISTOR	PW1000	157179	1458786-503	CIRCUIT COMPLETE
Q903	119635	1417333-001	TRANSISTOR				
R919	155086	1468990-001	RES NETWORK	Q1001	142686	1417346-001	TRANSISTOR
	148063	2870664-001	COVER, FRONT	Q1002	142686	1417346-001	TRANSISTOR
	148064	2840591-001	COVER, REAR	Q1003	145395	1417318-007	TRANSISTOR
	133319	938316-013	GROMMET				
REMOTE TRANSMITTER ASSEMBLIES				T1001	153344	2860715-001	TRANSFORMER
					155118	993225-001	BATTERY, ALKALINE (NEDA 15A)
					157176	149700-001	BUTTON, SINGLE
					153339	2831260-010	CASE, TOP W/SWITCH
					157178	2843202-501	CASE, BOTTOM W/LENS
					153346	284221-511	CIRCUIT, SWITCH CONTACT
						1497017-001	CONTACT, DUAL BATTERY
					153347	1497018-001	CONTACT, SINGLE BATTERY
					157177	2831268-002	DOOR, BATTERY
					153348	2483210-001	PAD, ANTI SKID
					129796	1444961-001	SPRING, BATTERY CONTACT
					145832	2840323-001	TERMINAL, FOR P10



FILE
1983
CTC 120 — S1 (I)
RCASCO

Color Television Supplement Service Data

CTC 120 Series

RCA Corporation Consumer Electronics

Technical Publications
P.O. Box 1976 | Indianapolis, Indiana 46206

RCA Inc.

Technical Publications
5575 Royalmount Avenue | Town of Mount-Royal | Quebec, Canada H4P 1J8

Canada Stock Numbers:
Add prefix **64** to **Module** stock numbers.
Add prefix **70** to **Tuner** stock numbers.
Add prefix **62** to **all other** stock numbers.

SAFETY NOTICE USE ISOLATION TRANSFORMER WHEN SERVICING

Components having special safety characteristics are identified by shading on schematics and by ★ stars on the parts list in this Service Data and its supplements and bulletins. Before servicing this chassis, it is important that the service technician read and follow the "Safety Precautions" and "Product Safety Notices" in this Service Data.

★ For continued x-radiation protection, replace picture tube with original type or RCA-approved equivalent type. If field replacement of picture tube is required, an ADJUSTABLE TYPE BEAM BENDER must be ordered and installed on the neck of the replacement picture tube. Consult parts list for correct stock number.

Model-To-Major Assembly Cross Reference

MODEL	CHASSIS	TUNER CONTROL	TUNERS UHF/VHF	RADIO	PICTURE TUBE
JJR950W,Y	CTC 120A	VTCA-7A	MST 010RA		★19VLNP22
JJR955W,Y	CTC 120A	VTCA-7A	MST 010RA	RC 3042	★19VLNP22

General Information

Models JJR950 and JJR955 are designed primarily for Hotel/Motel use. They employ tamper-proof screws for the cabinet back.

These receivers are also equipped with a Volume Limiter control, a theft alarm jack and a cover plate for the service controls to discourage unauthorized service adjustments.

The TV chassis differs from that covered in the Basic Service Data by the addition of a rear auxiliary control bracket attached to the chassis rear rail.

MST 010RA UHF/VHF tuner alignment is exactly the same as MST 008RA described in the Basic Service Data. Signal input to the tuner is through an antenna block assembly mounted to the cabinet rear.

Volume Limiter

Turn volume limiter, R2002 (located on the rear of the chassis) to mid-range. Turn Volume Control fully clockwise. Now turn Volume Limiter control for maximum desired volume.

This is a Supplement Service Data. It covers model-related information and any exceptions to the Basic Service Data 1983 CTC 120

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CTC 120 Series

1983 CTC 120 — S1 (I)

See Basic Service Data for additional disassembly instructions.

Cabinet Back Removal

Before removing the cabinet back, read "Safety Precautions" on page 2 of Basic Service Data.

1. Disconnect power cord from AC outlet.
2. Disconnect antenna leads from antenna block assembly.
3. Remove seven (7) 1/4" hex head screws: Two (2) from top edge of cabinet back, two (2) from rear auxiliary control bracket area, one (1) to right of Sharpness Control and two (2) at bottom edge of cabinet back.

Auxiliary Control Assembly Removal

Remove one (1) screw and pull assembly straight back and out of instrument (remove P107 from chassis). Note: LDR leads are attached to PW 4200 board.

Crystal (VTCA Cover) Removal

Open auxiliary control door. Remove two (2) 1/4" hex head screws located above auxiliary controls. Grasp bottom edge of crystal, tilt out and pull down until crystal clears instrument.

Tuner Control Assembly VTCA 7A Removal

- Remove crystal (see procedure).
- Remove channel selector knob.
- Disconnect P302 from chassis and P103 from PW AC board.
- Remove four (4) 1/4" hex head screws.
- Pull assembly straight back and out of instrument.

Power On/Off Switch Removal

Remove two (2) 1/4" hex head screws holding switch to cabinet front. Disconnect P101 from PW AC board. Pull assembly straight back and out of instrument.

Volume Control Removal

Remove knob from front of instrument. Remove two (2) 1/4" hex head screws and disconnect P2001 from J2001 (JGR950) or P2008 and J2002 (JGR955). Pull assembly straight back and out of instrument.

Radio Chassis and Mode Switch Removal - JJR955

Remove tuning knob from front of instrument. Remove five (5) screws: One (1) from top of mode switch, one (1) from top of radio dial bracket, and two (2) from bottom of dial bracket and one (1) from rear support bracket to chassis frame. Disconnect radio antenna leads from antenna block, J2002 and cable assembly from P2002, J2007 and cable assembly from P2007 and J110 and cable assembly from P110. Move rear support bracket aside far enough to withdraw radio assembly toward rear and out of instrument.

LDR Assembly Removal

This assembly is held in place by one (1) 1/4" screw. The screw and assembly must be removed from the rear. Note: LDR leads are attached to PW 4200 circuit board.

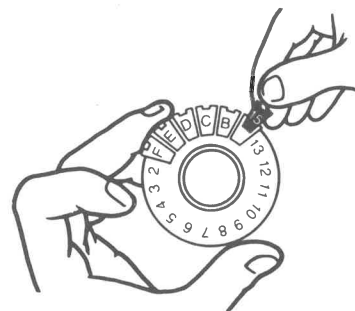


Fig. 1—Insert Replacement

UHF Channel Indicator Insert Replacement (VTCA 7A)

Remove crystal (see procedure). To remove lettered inserts, remove channel selector knob by gripping it between your thumb and forefinger and pull it toward you. Push outer edge of the channel tab towards the center of the dial to release from locked notch on the dial. Hold the numbered tab by the notched side (Fig. 1). Place the small end of insert into the grooves at each side of window opening and slide toward the knob (Fig. 1) until the notch end of insert locks into the outer rim of the dial. Replace channel selector knob and crystal.

VHF/UHF CHANNEL ADJUSTMENTS

VHF Channel Tuning

- Remove crystal (see procedure).
- Turn TV "On", select an active channel in your area and allow set to warm up a few minutes.
- Place AFT switch in "off" position.
- Turn the VHF Fine Tuning Screw to obtain best picture and sound. Repeat adjustment for all local VHF channels. Place AFT switch in "on" position.

UHF Channel Tuning

- Six channel positions are available for selecting any of the possible 70 UHF channels. These positions are designated as channel A thru F. Rotate the channel selector to one of these positions (example Channel A). Place the AFT switch in "off" position. There is a scale calibrated from channel 14 thru channel 83. This is to be used as a tuning aide.
- Follow tuning procedure outlined for VHF tuning, rotating the thumb wheel to the left to tune lower channels and to the right to tune higher channels. Repeat the adjustment for all local UHF channels. Place AFT switch in "on" position. Replace crystal.

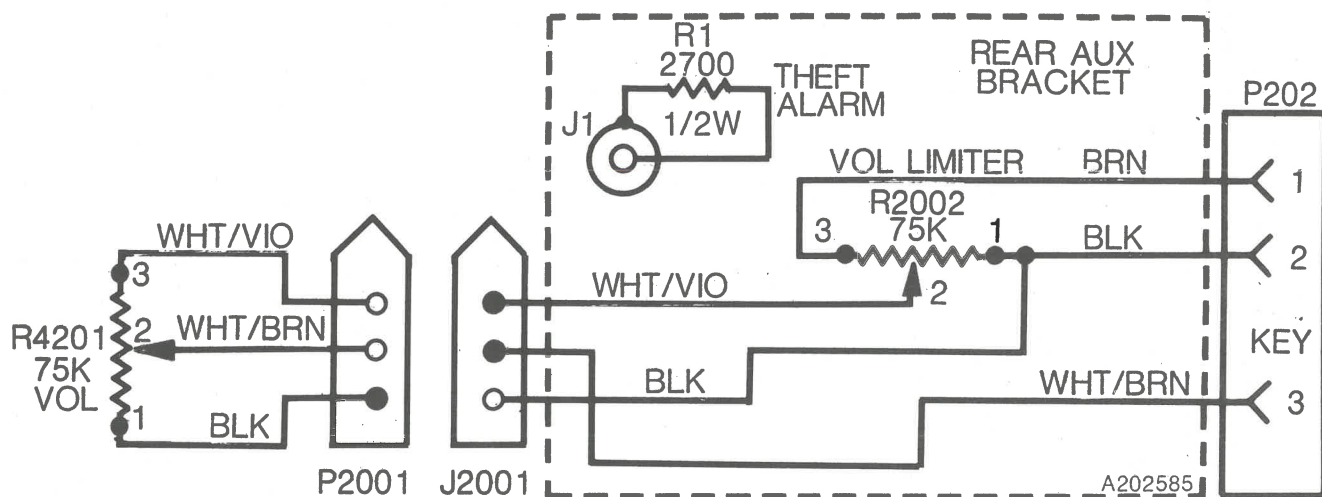


Fig. 2—JJR950 Partial Schematic

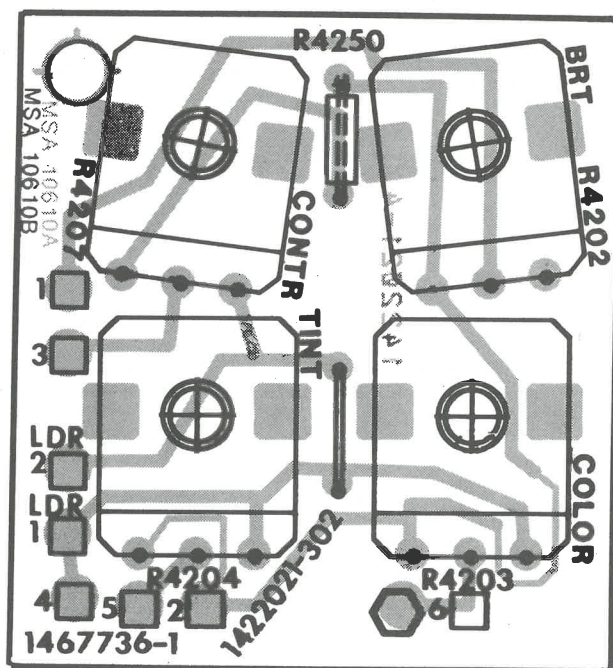


Fig. 3—Auxiliary Control Circuit Board

1983 CTC 120-S1 (I) RADIO CIRCUIT BOARD AND DIAL CORD

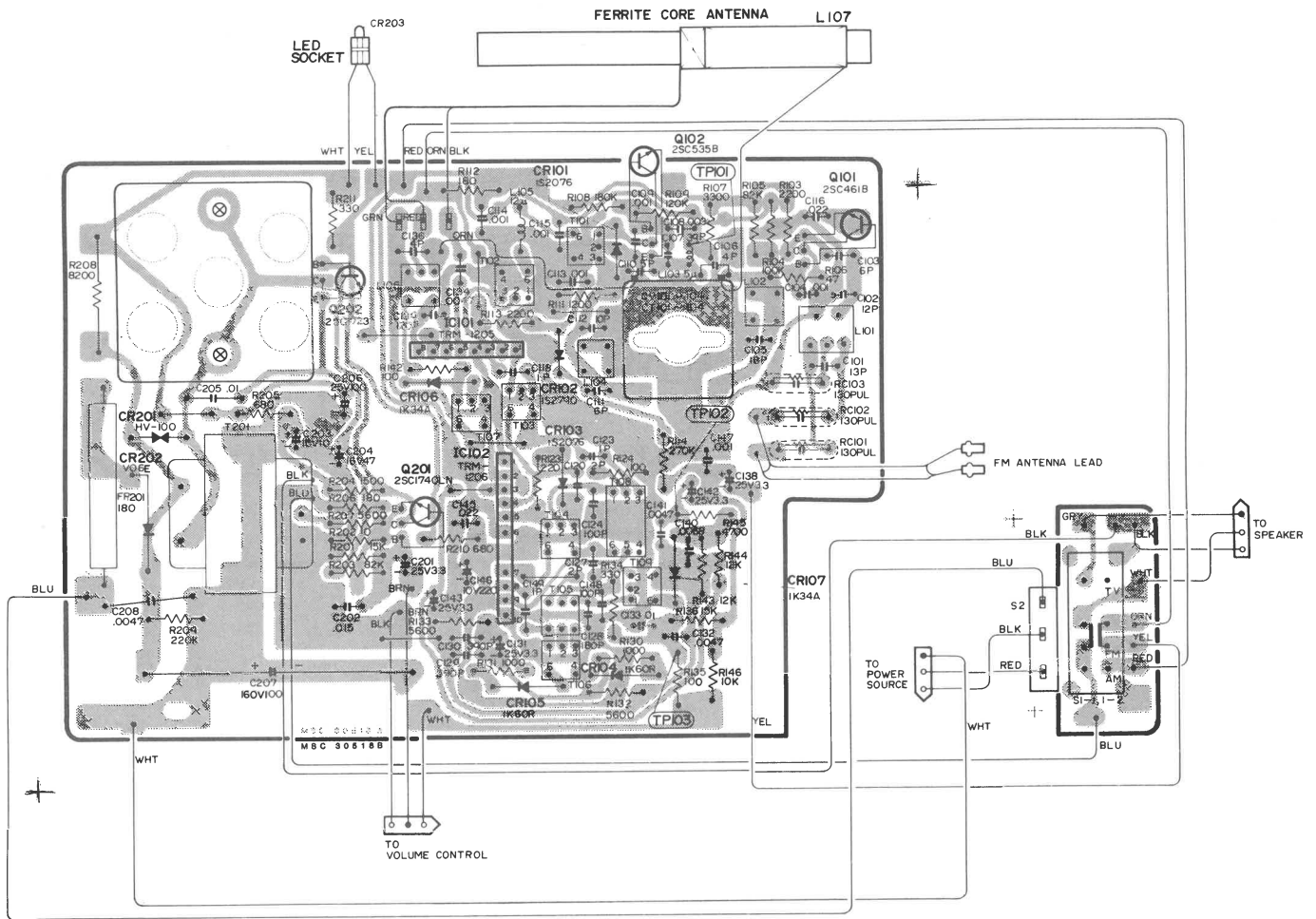


Fig. 4—RC 3042 Circuit Board View (JJR 955)

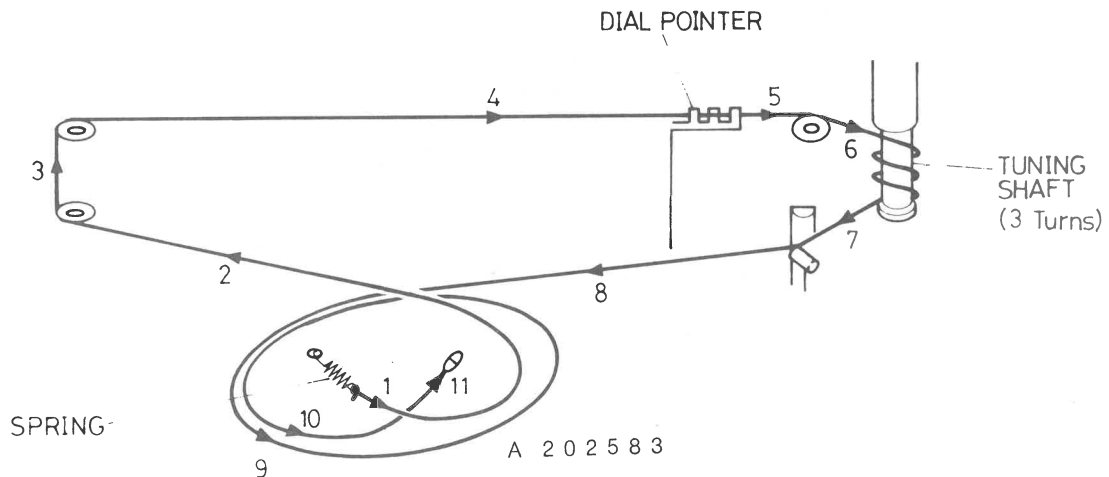
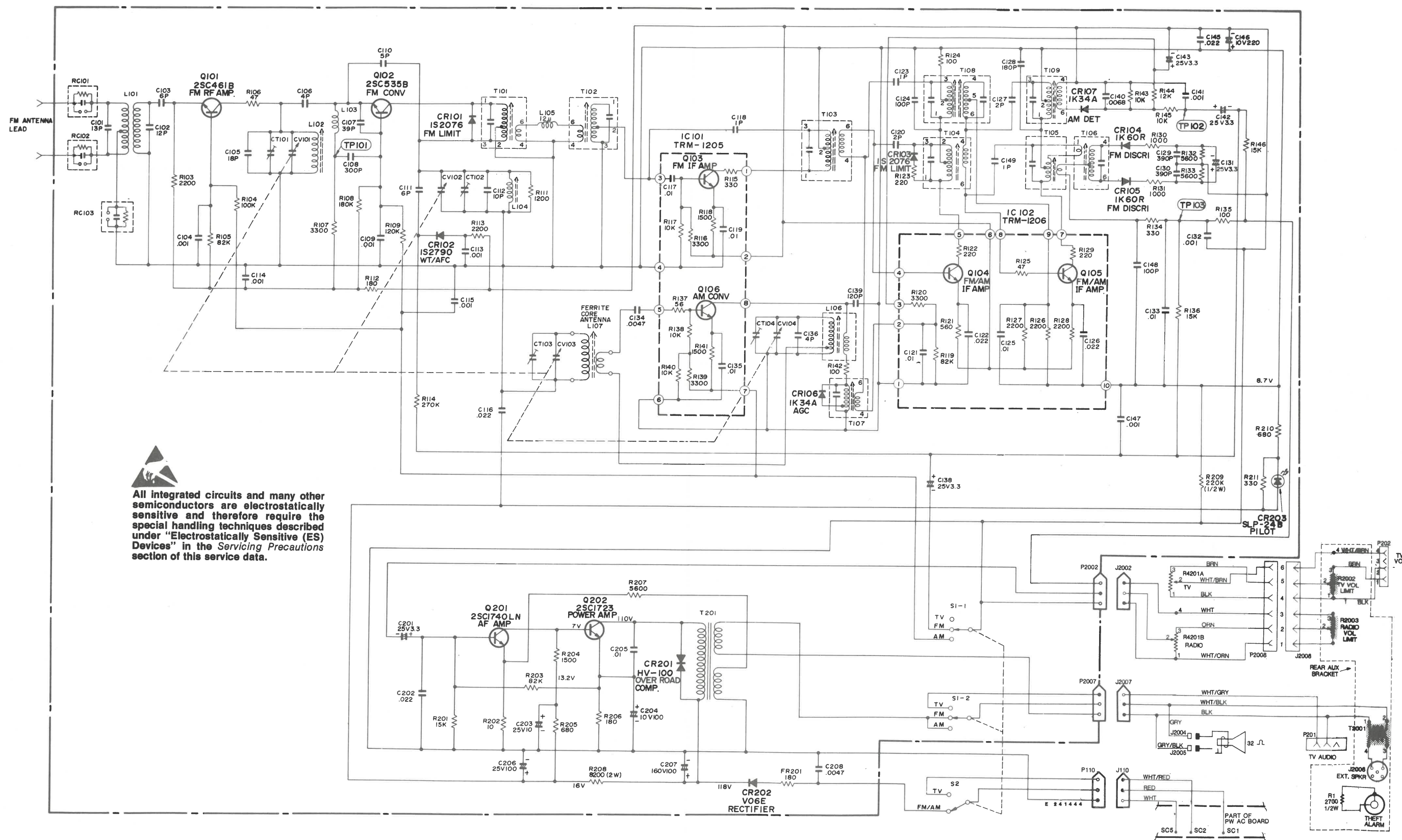


Fig. 5—RC 3042 Dial Cord Stringing Diagram (JJR 955)



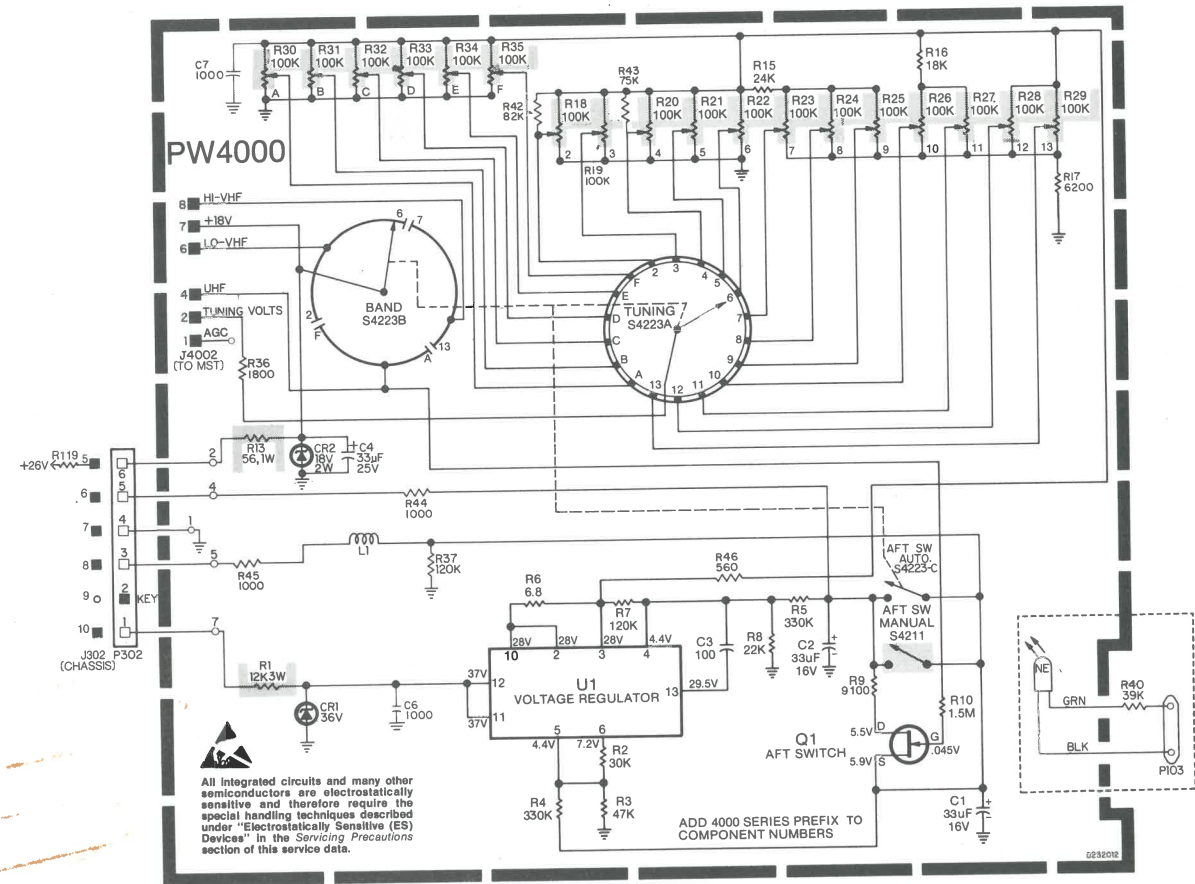


Fig. 7—VTCA 7A Schematic

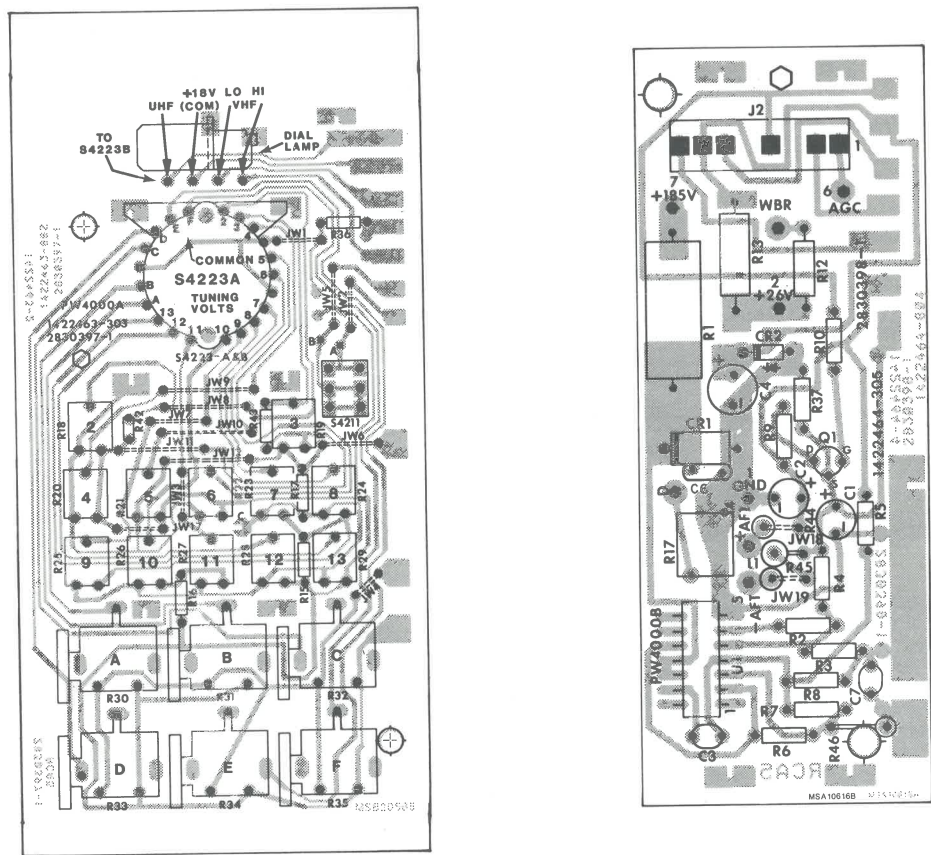


Fig. 8—PW 4000A,B Circuit Board Views

Instruments Required

Signal Sources

1. R-F Signal Sweep Generator
2. TV/FM Sweep Generator
3. Marker Generator
4. DC Power Supply (12V DC)

Output Indicators

1. Electronic Voltmeter
2. Oscilloscope

General Alignment Conditions

1. Signal input must be kept as low as possible to avoid overload and clipping. (Use highest possible sensitivity of output indicator.)
2. Markers must be accurate (crystal controlled or calibrated). The 10.7 MHz marker used in each section of the FM alignment must be the same. (Generator dial should not be moved.)

AM ALIGNMENT

Note: Connect DC power supply (11.5V) to TP4 and TP8.

Connect Signal Source to—	Connect Output Indicator to—	Set Signal to—	Set Radio Dial to—	Adjust	Adjust for—
Set "Function" Switch to AM					
Signal generator connected to a loop or short piece of wire placed near AM antenna	E.V.M. or oscilloscope connected to TP 102	455 kHz (modulated)	tuning gang open	T107, T108, T109	Maximum
		525 kHz (modulated)	525 kHz	L106	
		1600 kHz (modulated)	1600 kHz	CT 104	
		1400 kHz (modulated)	1400 kHz (rock gang)	CT 103	
Repeat above steps as necessary to obtain maximum sensitivity					

FM ALIGNMENT

Note: Connect DC power supply (11.5V) to TP3.

Connect Signal Source to—	Connect Output Indicator to—	Set Signal to—	Set Radio Dial to—	Adjust	Adjust for—	
Set "Function" Switch to FM and detune ratio detector T106						
FM sweep generator to TP 101.	Oscilloscope connected to TP 103.	10.7 MHz (unmodulated)	Gang open	T103	T104	
				T101	T102	maximum gain with symmetrical curve peaked at 10.7 MHz marker
					T105	
				T106 and retouch T105	Straightness and symmetry of "S" curve with 10.7 MHz marker at zero crossover	
Repeat above steps as necessary to obtain maximum sensitivity						
Marker generator loosely coupled to FM antenna (TP1 and TP2).	E.V.M. connected to TP 103.	88 MHz (modulated)	88 MHz	L104	Maximum	
		108 MHz (modulated)	108 MHz	CT 102		
		90 MHz (modulated)	90 MHz	L102		
		106 MHz (modulated)	106 MHz	CT 101		
Repeat above steps as necessary to obtain maximum sensitivity						

BEFORE REPLACING PARTS, READ THE FOLLOWING:

RCA-Approved Substitute Stock Numbers—Before ordering stock numbers in this parts list, look for an RCA-approved substitute stock number in the current *RCA Distributor & Special Products Price Schedule*. This will minimize your service time and avoid ordering parts you already have in stock.

See your RCA Distributor for Replacement Parts and Accessories.

Warranty Status of Assemblies and Parts—The warranty status of some assemblies and parts are indicated by one of the following Warranty Status Codes:

- Complete assembly not eligible for warranty exchange or replacement.
- † Eligible for warranty exchange for new or rebuilt unit.
- ‡ Complete assembly eligible for warranty replacement with new or rebuilt unit.

All parts listed without a Warranty Status Code symbol are eligible for warranty replacement as discrete components.

Warranty replacement of cabinet parts requires prior approval of RCA.

Warranty Status and Specifications of assemblies and parts are subject to change without notice.

PRODUCT SAFETY NOTE—Components marked with a (*) have special characteristics important to safety. Before replacing any of these components, read carefully the **PRODUCT SAFETY NOTICE** in the Basic Service Data. Do not degrade the safety of the set through improper servicing. Although assemblies as a whole may not be marked with a (*), replacement of RCA assemblies with other assemblies not RCA approved may result in a safety hazard.

Canada Stock Numbers:
Add prefix 64 to Module stock numbers.
Add prefix 70 to Tuner stock numbers.
Add prefix 62 to all other stock numbers.

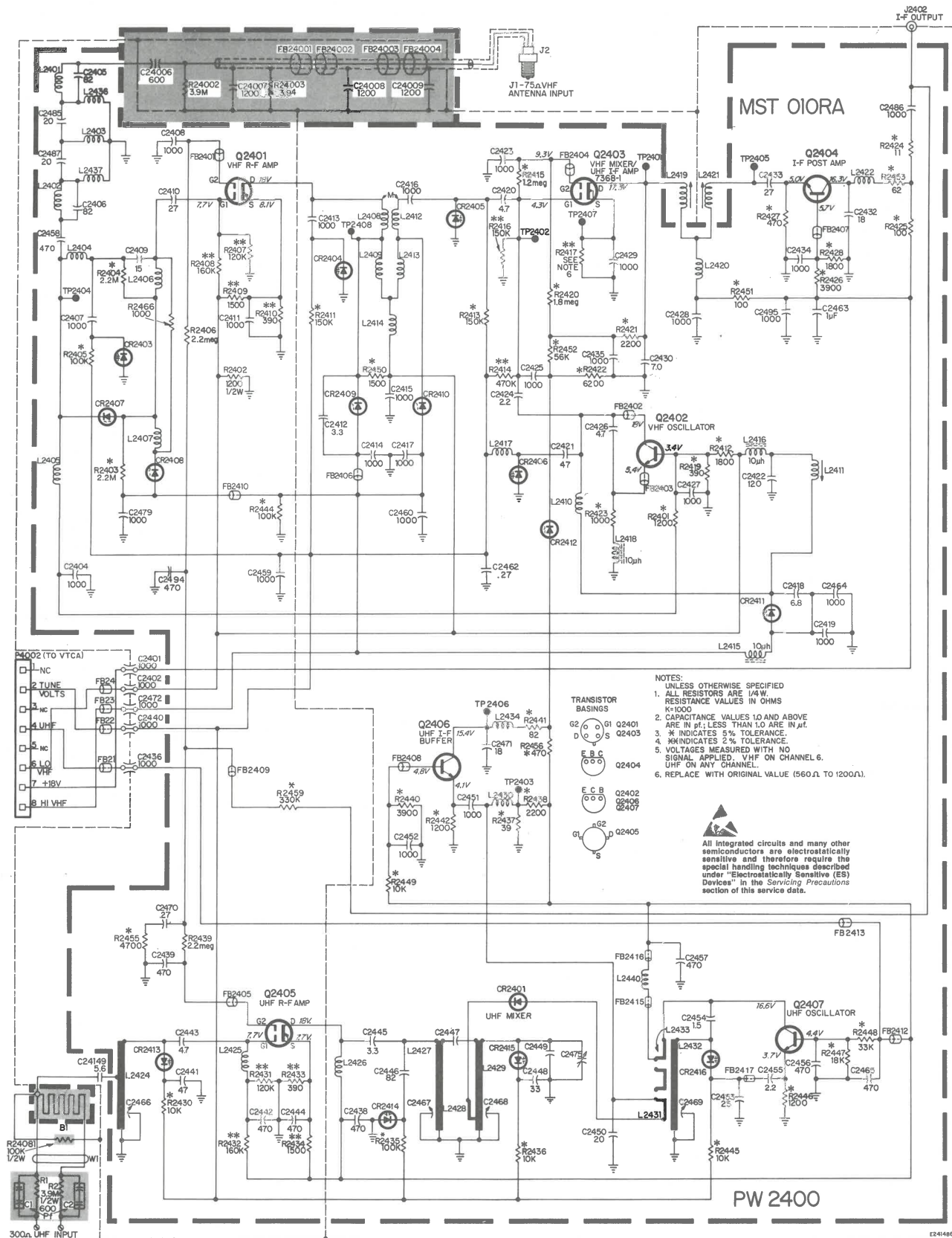
.....AVOID REPLACEMENT PART ERRORS.....
File supplements and addendums immediately upon receipt, and consult the parts lists in them before ordering parts.

NOTE: For complete coverage of all parts and assemblies used in instruments equipped with the chassis series to which this service data relates, consult the following publications:

● **Basic Service Data**—Chassis and tuning systems and most related parts and assemblies that do not differ from one model or model group to another.

● **Service Data Supplements**—Cabinet, auxiliary, and other parts and assemblies that differ from one model group to another.

● **Service Data Addendum**—Any parts additions, deletions, or other changes made after initial production.
Do not replace or order parts without first consulting any Addendum(s) that may have been issued since publication of this service data.



1983 CTC 120 S1 (I) REPLACEMENT PARTS

Replacement Parts Continued (See Product Safety Note on first page of this parts list)

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
FB24001	150725	1443391-019	BEAD
FB24002	150725	1443391-019	BEAD
FB24003	150725	1443391-019	BEAD
FB24004	150725	1443391-019	BEAD
J2	131222	1496154-001	CONNECTOR 1 PIN
L15	153393	2843295-001	COIL 12UH
L16	153393	2843295-001	COIL 12UH
L18	153393	2843295-001	COIL 12UH
L19	157456	973969-035	COIL 1.12UH
L21	157455	973969-034	COIL .328UH
P4002	157150	2861608-304	CONNECTOR 8 PIN
P24002	158049	2871848-001	CONNECTOR 1 PIN
Q1	148085	2814681-001	TRANSISTOR VHF RF AMP
Q2	141370	1417377-003	TRANSISTOR VHF LOW
Q3	148968	2814682-001	TRANSISTOR VHF MIXER
Q4	153489	1417392-002	TRANSISTOR IF POST AMP
Q5	146521	2811975-001	TRANSISTOR UHF RF AMP
Q6	151693	1417392-001	TRANSISTOR UHF IF BUFFER
Q7	151326	1417360-001	TRANSISTOR UHF LOW
R3	829522	993230-177	RES CF 1/4W 10% 2.2M
R4	829522	993230-177	RES CF 1/4W 10% 2.2M
R7	829412	993230-747	RES CF 1/4W 2% 120K
R15	829512	993218-471	RES CF 1/4W 5% 1.2M
R16	829415	993230-749	RES CF 1/4W 2% 150K
R20	829518	993230-475	RES CF 1/4W 5% 1.8M
R33	829139	993230-687	RES CF 1/4W 2% 390R
R34	829215	993230-701	RES CF 1/4W 2% 1.5K
R24002	157308	2812886-007	* RES CC 1/2W 10% 3.9M
R24003	157308	2812886-007	* RES CC 1/2W 10% 3.9M
R24081	157949	2812886-010	* RES CC 1/2W 10% 100K
	157951	2830509-002	COVER, TOP AND BOTTOM
	157460	1491191-002	SPRING, BOTTOM COVER
	157459	1491192-002	SPRING, TOP COVER
	157458	1491194-002	SPRING, 'V' BOTTOM
TUNER CONTROL ASSEMBLY			
VTCA7A			
VTCA 7A	155700	2841294-509	CIRCUIT COMPLETE
C4001	147622	1490305-432	CAP LYTC 33UF N 16V
C4002	147622	1490305-432	CAP LYTC 33UF N 16V
C4003	143870	1491406-60M	CAPCD 100PF Z Z5P 50V
C4004	143688	1490001-010	CAP LYTC 33UF R 25V
C4006	120832	1490141-12M	CAPCD 1000PF K Z5P 250V
C4007	145168	1491413-90R	CAPCD 1000PF Z Z5V 50V
CR4001	149751	99202-229	DIODE ZENER 36V
CR4002	141187	1477046-010	DIODE ZENER 18V
L4001	143893	1496280-012	COIL 2.2UH
P302	157952	1467768-205	CONNECTOR 6 PIN
Q4001	148070	1417411-001	TRANSISTOR, FET
R4001	149762	993117-151	* RES MFFP 3W 5% 12K
R4006	149761	993230-345	RES CF 1/4W 5% 6.8R
R4010	829515	993230-473	RES CF 1/4W 5% 1.5M
R4013	831056	993115-195	* RES MFFP 1W 5% 56R
R4018	149753	1473373-030	* RES CONTROL TUNING
R4019	149753	1473373-030	* RES CONTROL TUNING
R4020	149753	1473373-030	* RES CONTROL TUNING
R4021	149753	1473373-030	* RES CONTROL TUNING
R4022	149753	1473373-030	* RES CONTROL TUNING
R4023	149753	1473373-030	* RES CONTROL TUNING
R4024	149753	1473373-030	* RES CONTROL TUNING
R4025	149753	1473373-030	* RES CONTROL TUNING
R4026	149753	1473373-030	* RES CONTROL TUNING
R4027	149753	1473373-030	* RES CONTROL TUNING
R4028	149753	1473373-030	* RES CONTROL TUNING
R4029	149753	1473373-030	* RES CONTROL TUNING
R4030	149754	2870949-002	* RES CONTROL TUNING
R4031	149754	2870949-002	* RES CONTROL TUNING
R4032	149754	2870949-002	* RES CONTROL TUNING
R4033	149754	2870949-002	* RES CONTROL TUNING
R4034	149754	2870949-002	* RES CONTROL TUNING
R4035	149754	2870949-002	* RES CONTROL TUNING
S4211	149750	1467712-004	* SWITCH AFT DEFEAT MANUAL
S4223A/B	149749	1467785-001	SWITCH CHANNEL SELECT/BAND

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
S4223C	156371	2870952-002	SWITCH AFT DEFEAT AUTO
U4001	149255	1421763-002	IC REGULATOR
	152203	2841294-503	DETENT, ASSEMBLY W/SHAFT
	139301	1479290-001	RETAINER, BEAD CHAIN
	157144	2870954-001	SPRING, RETAINER
RADIO CHASSIS			
RC3042			
	152549	2830557-001	CIRCUIT, RC3042 COMPLETE
C101	152554		CAPCD 13PF K 50V
C102	167697		CAPCD 12PF J 50V
C103	111838		CAPCD 6PF D 50V
C104	143879		CAPCD 1000PF M 50V
C105	168356		CAPCD 18PF J 50V
C106	169265		CAPCD 4PF D 50V
C107	169553		CAPCD 39PF K 50V
C108	165662		CAPCD 300PF J 50V
C109	143879		CAPCD 1000PF M 50V
C110	169252		CAPCD 5PF D 50V
C111	111838		CAPCD 6PF D 50V
C112	169271		CAPCD 10PF D 50V
C113	143879		CAPCD 1000PF M 50V
C114	143879		CAPCD 1000PF M 50V
C115	143879		CAPCD 1000PF M 50V
C116	152083		CAPCD .022UF Z 50V
C118	169552		CAPCD 1PF C 50V
C120	169551		CAPCD 2PF C 50V
C123	169552		CAPCD 1PF C 50V
C124	169268		CAPCD 100PF K 50V
C127	169551		CAPCD 2PF C 50V
C128	168550		CAPCD 180PF J 50V
C129	152606		CAPCD 390PF J 50V
C130	152606		CAPCD 390PF J 50V
C131	169261		CAP LYTC 3.3UF 25V
C132	167827		CAPCD .01UF M 50V
C133	167827		CAPCD .01UF M 50V
C134	123800		CAP POLY 4700PF PF M 500V
C136	169265		CAPCD 4PF D 50V
C138	169261		CAP LYTC 3.3UF 25V
C139	143873		CAPCD 120PF K 500V
C140	123801		CAP POLY 6800PF M 50V
C141	167827		CAPCD .01UF M 50V
C142	169261		CAP LYTC 3.3UF 25V
C143	169261		CAP LYTC 3.3UF 25V
C145	169278		CAP OLY .022UF M 50V
C146	127477		CAP LYTC 220UF 10V
C147	143879		CAPCD 1000PF M 50V
C148	169268		CAPCD 100PF K 50V
C149	169552		CAPCD 1PF C 50V
C201	169261		CAP LYTC 3.3UF 25V
C202	169278		CAP POLY .022UF M 50V
C203	146464		CAP LYTC 10UF 25V
C204	168517		CAP LYTC 100UF 10V
C205	167827		CAPCD .01UF K 50V
C206	152552		CAP LYTC 100UF 26V
C207	168725		CAP LYTC 100UF 160V
C208	152270		CAPCD 4700PF P 50V
CR101	147213		DIODE
CR102	172856		DIODE
CR103	147213		DIODE
CR104	152551		DIODE
CR105	152551		DIODE
CR106	152550		DIODE
CR107	152550		DIODE
CR201	123296		THERMISTOR
CR202	166726		DIODE
CR203	152548		DIODE
FR201	167707		RES FUSE
IC101	152547		IC
IC102	152546		IC
L101	165105		COIL
L102	169560		COIL
L103	167035		COIL
L104	165664		COIL
L105	166722		COIL
L106	168709		COIL
Q101	125994		TRANSISTOR
Q102	170388		TRANSISTOR
Q201	152544		TRANSISTOR

Continued on next page

1983 CTC 120 S1 (I) REPLACEMENT PARTS

Replacement Parts Continued (See Product Safety Note on first page of this parts list)

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
Q202	152545		TRANSISTOR
R208	832282		RES MF 2W 5% 8200R
RC101	152553		CIRCUIT ENCAPSULATED
RC102	152553		CIRCUIT ENCAPSULATED
RC103	152553		CIRCUIT ENCAPSULATED
S1	152537		SWITCH
S2	153968		SWITCH
T101	168717		TRANSFORMER
T102	168716		TRANSFORMER
T103	168715		TRANSFORMER
T104	168714		TRANSFORMER
T105	168713		TRANSFORMER
T106	152543		TRANSFORMER
T107	152542		TRANSFORMER
T108	168711		TRANSFORMER
T109	168710		TRANSFORMER
T201	152541		TRANSFORMER
	152539		ANTENNA, FERRITE
	118750		CONNECTOR
	147154		E-RING, 3MMD
	152535		POINTER
	152534		PULLEY
	152113		SCREW, 2.6MMD X 5MM
	152538		SHAFT, TUNING
	168321		SPRING
	152540		SOCKET, LED
	152537		SWITCH
	152536		SWITCH
	123895		TERMINAL, FEMALE
	118414		TERMINAL, MALE
INSTRUMENT ASSEMBLIES			
JJR950W,Y			
JJR955W,Y			
C1	147918	2870697-210	* CAPCD 600PF M Z5U 1.4KV
C2	147918	2870697-210	* CAPCD 600PF M Z5U 1.4KV
C424	156249	2843149-502	CAP WIDTH ASSEMBLY
DS4001	152202	1466974-514	LAMP ASSEMBLY COMPLETE
F101	154521	2813593-001	* FUSE 5A
J1	150722	2871835-002	CONNECTOR
J110	118532	1461635-023	CONNECTOR
J2002	118532	1461635-023	CONNECTOR
J2006	112653	1440476-001	CONNECTOR
J2007	118532	1461635-023	CONNECTOR
J2008	152847	2860006-005	CONNECTOR
L101	154301	1496553-504	* COIL
L101	148491	1463890-507	* COIL DEGAUSSING
P104	158677	2861681-008	CONNECTOR DEGAUSSING
P201	157814	2861602-300	CONNECTOR JJR950W,Y
P201	157826	2861603-303	CONNECTOR JJR955W,Y
P202	157354	2861604-303	CONNECTOR
P401	153788	2831216-001	* CONNECTOR QUAD YOKE
P501	153790	2860026-001	* CONNECTOR DUAL YOKE
P701	158238	2861607-306	CONNECTOR

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
P2001	118750	1461635-013	CONNECTOR
P2008	147690	1467768-005	CONNECTOR
R1	502539	82283-105	* RES CC 1/2W 5% 3.9M
R2	502539	82283-105	* RES CC 1/2W 5% 3.9M
R2002	145304	1472268-041	* RES CONTROL VOL LIMITER
R2003	149908	1472268-042	* RES CONTROL VOL LIMITER RADIO
R4201	149907	1473326-036	* RES CONTROL VOL TV
R4201	149906	1472202-002	* RES CONTROL VOL TV/RADIO
R4202	147612	1473369-002	* RES CONTROL BRIGHTNESS
R4203	147613	1473369-004	* RES CONTROL COLOR
R4204	147613	1473369-004	* RES CONTROL TINT
R4207	149925	1473369-005	* RES CONTROL CONTRAST
S4201	150184	2842218-501	SWITCH
T2001	150346	1463873-506	* TRANSFORMER AUDIO
V101		2814626-001	* PICTURE TUBE 19VLNP22
	155648	2830357-004	* BACK, CABINET
	155636	2843306-502	BLOCK, ANTENNA COUPLING
	155637	2843306-503	BLOCK, ANTENNA COUPLING
	153435	1467652-001	BRACKET, CHASSIS MTG
	150186	1468912-001	* BUTTON, POWER
	155651	2840554-507	CABLE, AC POWER
	150471	1458752-502	CIRCUIT, AUX CONTROL
	143659	1491017-002	CLAMP, BEAM BENDER
	149902	1491071-002	CLAMP, YOKE
	111031	1491943-001	CLIP, FM ANTENNA
	149438	2841265-001	COVER, SET UP CONTROLS
	149903	2870908-001	CUSHION, WEDGE YOKE ADJ
	150189	2830503-001	DOOR, AUX CONTROL
	138785	1447321-006	GROMMET, FOR KINE SHIELD
	150190	1468938-001	HINGE, DOOR
	151689	2841834-002	INSERT, UHF CHANNEL
		2817343-001	INSTRUCTIONS JJR950W,Y
		2817345-001	INSTRUCTIONS JJR955W,Y
	151688	2871897-001	* INSULATOR, SLEEVE TUNING SHAFT
	150199	1468951-001	* KNOB, MODE SWITCH
	150187	1468199-502	* KNOB, SELECTOR
	150188	1468145-503	* KNOB, VOL, RADIO
	151686	2841812-001	LENS, DIAL LIGHT
	145381	1463762-502	MAGNET, BEAM BENDER
	155639	2830356-013	* MASK, CABINET FRONT JJR955W
	155640	2830356-014	* MASK, CABINET FRONT JJR950W
	155643	2830356-017	* MASK, CABINET FRONT JJR955Y
	155644	2830356-018	* MASK, CABINET FRONT JJR950Y
	114918	990327-128	NUT, CONTROL MTG
	124338	1403390-405	NUT, SPEAKER MTG
	147917	2840857-001	OVERLAY, ANTENNA SWITCH
	150192	1468176-002	OVERLAY, TUNING
	151414	2841836-505	RES LIGHT DETECTING
	113348	990300-012	RETAINER, SPRING J TYPE
	149552	2871314-002	* SCREW, KINE MTG
	150474	2841923-501	* SHIELD KINE HOOD
	156280	1468975-005	SPEAKER, 3 X 5 INCH 32 OHM
	155655	2871319-002	SPRING, DOOR LATCH
	157160	2870558-003	TERMINAL, ANTENNA
	123895	1442877-104	TERMINAL, FEMALE
	118414	1442877-204	TERMINAL, MALE
	153791	2870572-002	TERMINAL, P104,P501
	153789	2860025-001	TERMINAL, P401
	150200	2981816-001	WINDOW, RADIO
	150191	2830507-001	WINDOW, READOUT
	153294	2842008-503	* YOKE



FILE
1983
CTC 120 — S2

Color Television Supplement Service Data

CTC 120 Series

RCA Corporation Consumer Electronics

Technical Publications
P.O. Box 1976 | Indianapolis, Indiana 46206

RCA Inc.

Technical Publications
5575 Royalmount Avenue | Town of Mount-Royal | Quebec, Canada H4P 1J8

Canada Stock Numbers:
Add prefix **64** to **Module** stock numbers.
Add prefix **70** to **Tuner** stock numbers.
Add prefix **62** to **all other** stock numbers.

SAFETY NOTICE

USE ISOLATION TRANSFORMER WHEN SERVICING

Components having special safety characteristics are identified by shading on schematics and by ★ stars on the parts list in this Service Data and its supplements and bulletins. Before servicing this chassis, it is important that the service technician read and follow the "Safety Precautions" and "Product Safety Notices" in the Basic Service Data.

★ For continued x-radiation protection, replace picture tube with original type or RCA-approved equivalent type. If field replacement of picture tube is required, an ADJUSTABLE TYPE BEAM BENDER must be ordered and installed on the neck of the replacement picture tube. Consult parts list for correct stock number.

Model-To-Major Assembly Cross Reference

MODEL	CHASSIS	TUNER CONTROL	TUNER VHF/UHF MULTIBAND	PICTURE TUBE	REMOTE
FJR 475W	CTC 120A	MSC011A	MST007RA	★19VLNP22	
FJR 476W	CTC 120A	MSC011A	MST007RA	★19VLNP22	
FJR 477F	CTC 120A	MSC011A	MST007RA	★19VLNP22	
FJR 478WR	CTC 120A	MSC012RA	MST007RA	★19VLNP22	MCR016RA/CRK28G
FJR 479WR	CTC 120A	MSC013RA	MST007RA	★19VLNP22	MCR016RA/CRK28G
FJR 480FR	CTC 120A	MSC013RA	MST007RA	★19VLNP22	MCR016RA/CRK28G
GJR 636P	CTC 120A	VTCA5A	MST008A	★25VGDP22	
GJR 638P	CTC 120A	VTCA5A	MST008A	★25VDGP22	
GJR 657PR	CTC 120A	MSC012RA	MST007RA	★25VGDP22	MCR017AREV1/CRK33H
GJR 660T	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJR 661TR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR016RA/CRK28G
GJR 668P	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJR 669PR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR016RA/CRK28G
GJR 670T	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJR 672TR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR016RA/CRK28G
GJR 673T	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJR 674TR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR016RA/CRK28G
GJR 676P	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJR 677PR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR016RA/CRK28G
GJR 678P	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJR 679PR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR016RA/CRK28G

This is a Supplement Service Data. It covers model-related information and any exceptions to the Basic Service Data 1983 CTC 120

See Basic Service Data for additional disassembly instructions.

Auxiliary Control Assembly Removal

Remove one $\frac{1}{4}$ " hex head screw (all models except VTCA versions) or two $\frac{1}{4}$ " hex head screws (VTCA versions only). Remove On/Off knob (VTCA models only). Pull assembly straight back and out of instrument (remove P701 from chassis).

Note: LDR leads are attached to PW 4200 board.

Model FJR475 and FJR476—Remove four $\frac{1}{4}$ " hex head screws and pull assembly straight back and out of instrument (remove P701 from chassis). **Note:** LDR assembly may have to be removed temporarily and threaded thru clearance hole of auxiliary control bracket for removal of auxiliary control assembly.

Tuner Control Assembly VTCA5A Removal

Open Auxiliary Control door.
Remove channel selector knob.
Disconnect P302 from chassis.
Remove four (4) $\frac{1}{4}$ " hex head screws.
Pull assembly straight back and out of instrument.

MST008RA Tuner Removal

Remove two $\frac{1}{4}$ " hex head screws (one on rear and one on front of mounting bracket). Disconnect P4002 from VTCA and withdraw tuner from cabinet.

Frequency Synthesis Tuner and Control Assembly Removal

Remove interconnect plug and cable assemblies.

P2MSC from J2MSC (on MSC module).
P1BCD (manual version) from Channel Switch Assembly.
P2BCD (remote version) from Channel Switch Assembly.
P1MCR (remote version) from MCR module.
P1MPS (remote version) from keyboard assembly.
P1SVS (remote version) from keyboard assembly.
P1LED from LED Channel Display Assembly.
P2LED from LED Channel Display Assembly.
P3MSC From MSC assembly
I-F Cable Assembly from J24001 (on MST Tuner Module).
P1101 From MCR016A
Remove VHF antenna (leads or cable) from antenna block.
Remove UHF antenna leads from UHF terminals.
Remove one (1) $\frac{1}{4}$ " hex head screw at rear of tuning assembly and remove one (1) $\frac{1}{4}$ " hex head screw at front of assembly (below P2MSC connector). Pull assembly back slightly and lift out of instrument.

Keyboard Assembly Removal

Remove the manual keyboard (manual versions) and remote tuning switch keyboard (remote versions) by first removing four (4) $\frac{1}{4}$ " screws. Disconnect P1BCD connector (manual version) or P1MPS connector and P2MCR (remote version). The assembly can then be removed from rear of the cabinet front.

LED Display Removal

Using needle nose pliers grasp spring mounting clip by leaf tab and pull spring clip off plastic mounting stud. Removal of one spring clip is sufficient. An alternate method is to use a thin pointed object and slip under the edge of the spring clip and pry loose from plastic mounting stud. Disconnect P1LED and P2LED connectors from LED Board.

Note: Care is required in removal of the spring clip so as to not break off plastic mounting stud.

On-Off Volume Assembly Removal (Manual Keyboard Versions)

Remove knob from front of set. Remove two (2) $\frac{1}{4}$ " hex head screws from assembly and remove assembly. Remove P101 and P202 from chassis.

MCR 015/017 Removal

Push spring clips (detented in notches on sides of MCR circuit board and withdraw board to the rear. Disconnect P106 (from J106 on chassis, P3MCR (from keyboard) and P1MCR (from MSC module).

MCR016 Removal

Remove one screw at front of assembly. Slide assembly forward and lift up.

LDR Assembly Removal

This assembly is held in place by one (1) $\frac{1}{4}$ " screw. The screw and assembly must be removed from the rear.

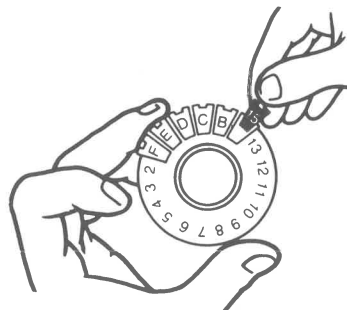


Fig. 1 — VTCA Models Insert Replacement

UHF Channel Indicator Insert Replacement (VTCA5)

To remove lettered inserts, remove channel selector knob by gripping it between your thumb and forefinger and pull it toward you. Push outer edge of the channel tab towards the center of the dial to release from locked notch on the dial. Hold the numbered tab by the notched side (Fig. 1) Place the small end of insert into the grooves at each side of window opening and slide toward the knob (Fig. 1) until the notch end of insert locks into the outer rim of the dial.

VHF/UHF CHANNEL ADJUSTMENTS (VTCA Models Only)

VHF Channel Tuning

Turn TV "On", select an active channel in your area and allow set to warm up a few minutes.

Place AFT switch in "off" position.

Turn the VHF Fine Tuning Screw to obtain best picture and sound. Repeat adjustment for all local VHF channels. Place AFT switch in "on" position.

UHF Channel Tuning

Six channel positions are available for selecting any of the possible 70 UHF channels. These positions are designated as channel A thru F. Rotate the channel selector to one of these positions (example Channel A). Place the AFT switch in "off" position. There is a scale calibrated from channel 14 thru channel 83. This is to be used as a tuning aid.

Follow tuning procedure outlined for VHF tuning, rotating the thumb wheel to the left to tune lower channel and to the right to tune higher channels. Repeat the adjustment for all local UHF channels. Place AFT switch in "on" position.

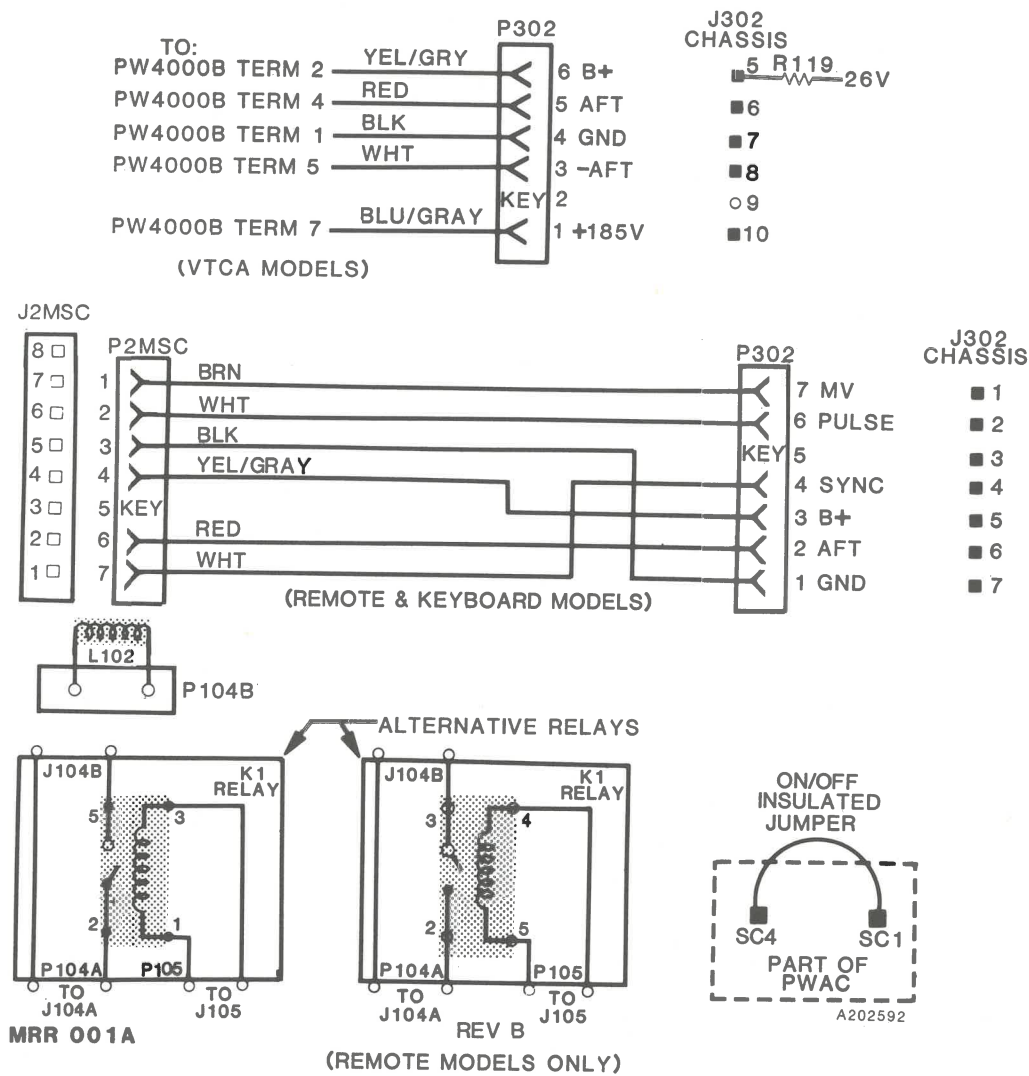
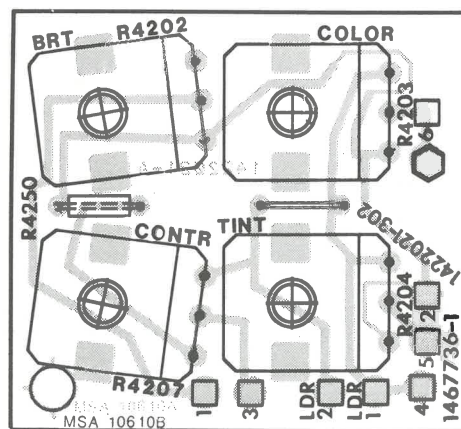
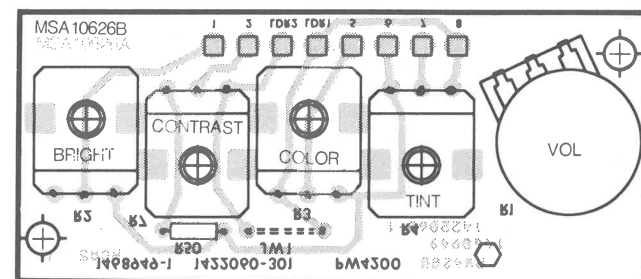


Fig. 2 — Interconnect Diagram



**Fig. 3 — Auxiliary Control Circuit Board —
All Models Except FJR475,
FJR476, GJR636 and GJR638**



**Fig. 4 — Auxiliary Control Circuit Board —
VTCA Models Only**

BEFORE REPLACING PARTS, READ THE FOLLOWING:

RCA-Approved Substitute Stock Numbers—Before ordering stock numbers in this parts list, look for an RCA-approved substitute stock number in the current *RCA Distributor & Special Products Price Schedule*. This will minimize your service time and avoid ordering parts you already have in stock.

See your RCA Distributor for Replacement Parts and Accessories.

Warranty Status of Assemblies and Parts—The warranty status of some assemblies and parts are indicated by one of the following Warranty Status Codes:

- Complete assembly not eligible for warranty exchange or replacement.
- † Eligible for warranty exchange for new or rebuilt unit.
- ‡ Complete assembly eligible for warranty replacement with new or rebuilt unit.

.....AVOID REPLACEMENT PART ERRORS.....
File supplements and addendums immediately upon receipt, and consult the parts lists in them before ordering parts.

NOTE: For complete coverage of all parts and assemblies used in instruments equipped with the chassis series to which this service data relates, consult the following publications:

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
INSTRUMENT ASSEMBLIES			
			FJR475W FJR476W FJR477F FJR478WR FJR479WR FJR480FR
C424	156249	2843149-502	CAP WIDTH ASSEMBLY
F101	154521	2813593-001	* FUSE 5A
J1MCR	118750	1461635-013	CONNECTOR
L101	154301	1496553-504	* COIL
L102	148491	1463890-507	* COIL DEGAUSSING
P1SVS	157824	2860742-005	CONNECTOR
P2MSC	158237	2861607-305	CONNECTOR
P101	159276	2860026-004	CONNECTOR
P104	158677	2861681-008	CONNECTORDEGAUSSING
P201	157814	2861602-300	CONNECTOR
P202	157354	2861604-303	CONNECTOR
P302	158237	2861607-305	CONNECTOR
P401	153788	2831216-001	* CONNECTOR QUAD YOKE
P501	158678	2861681-001	* CONNECTOR DUAL YOKE
P701	158238	2861607-306	CONNECTOR
P1103	158679	2861623-208	CONNECTOR
R4201	143924	1472207-101	* RES CONTROL VOLUME W/S4201 FJR475W,FJR476W
R4201	145723	1472207-102	* RES CONTROL VOLUME W/S4201 FJR477F
R4202	149685	1472201-075	RES CONTROL BRIGHTNESS FJR475W,FJR476W
R4202	147612	1473369-002	* RES CONTROL BRIGHTNESS FJR477F,FJR478WR, FJR479WR, FJR480FR
R4203	149684	1472201-074	RES CONTROL COLOR FJR475W,FJR476W
R4203	147613	1473369-004	* RES CONTROL COLOR FJR477F,FJR478WR, FJR479WR,FJR480FR
R4204	149684	1472201-074	RES CONTROL TINT FJR475W,FJR476W
R4204	147613	1473369-004	* RES CONTROL TINT FJR477F,FJR478WR, FJR479WR,FJR480FR
R4207	146425	1472201-063	RES CONTROL CONTRAST FRJ475W, FJR476W
R4207	149925	1473369-005	* RES CONTROL CONTRAST FJR477F,FJR478WR, FJR479WR,FJR480FR

All parts listed without a Warranty Status Code symbol are eligible for warranty replacement as discrete components.

Warranty replacement of cabinet parts requires prior approval of RCA.

Warranty Status and Specifications of assemblies and parts are subject to change without notice.

PRODUCT SAFETY NOTE—Components marked with a (★) have special characteristics important to safety. Before replacing any of these components, read carefully the **PRODUCT SAFETY NOTICE** in the Basic Service Data. Do not degrade the safety of the set through improper servicing. Although assemblies as a whole may not be marked with a (★), replacement of RCA assemblies with other assemblies not RCA approved may result in a safety hazard.

Canada Stock Numbers:
Add prefix **64** to **Module** stock numbers.
Add prefix **70** to **Tuner** stock numbers.
Add prefix **62** to **all other** stock numbers.

- **Basic Service Data**—Chassis and tuning systems and most related parts and assemblies that do not differ from one model or model group to another.
 - **Service Data Supplements**—Cabinet, auxiliary, and other parts and assemblies that differ from one model group to another.
 - **Service Data Addendum**—Any parts additions, deletions, or other changes made after initial production.
- Do not replace or order parts without first consulting any Addendum(s) that may have been issued since publication of this service data.**

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
S8B	153744	2841813-509	SWITCH, FJR478WR,FJR479WR
S8B	153429	2841813-507	SWITCH, FJR480FR
S10B	151978	2842238-501	SWITCH, FJR475W,FJR476W
S10B	150351	2841866-503	SWITCH, FJR477F
S4201			PART OF R4201
V101		2814626-001	* PICTURE TUBE 19VLNP22
	10E0113	1472698-003	ANTENNA, UHF
	156265	1467201-003	ANTENNA, VHF
	158088	1439347-006	* BACK, CABINET FJR475W,FJR476W, FJR478WR,FJR479WR
	157407	1439970-006	* BACK, CABINET FJR477F,FJR480FR
		2817314-001	BOOK, INSTRUCTION FJR475W,FJR476W
		2817331-001	BOOK, INSTRUCTION FJR477F
		2817315-001	BOOK, INSTRUCTION FJR478WR,FJR479WR
		2817337-001	BOOK, INSTRUCTION FJR480FR
	153435	1467652-001	BRACKET, CHASSIS MTG
	154300	2840554-506	CABLE, AC POWER
	150471	1458752-502	CIRCUIT, AUX CONTROL FJR477F,FJR478WR, FJR479WR,FJR480FR
	143659	1491617-001	CLAMP, BEAM BENDER
	149902	1491071-002	CLAMP, YOKE
	141701	1486223-003	CLIP, MCY MTG
	140428	1486684-001	CLIP, KEYBOARD RETAINER
	151991	2841270-001	CUSHION, DOOR
	149903	2870908-001	CUSHION, WEDGE YOKE ADJ
	158086	1466312-021	DOOR, AUX CONTROL FJR475W
	158085	1466312-022	DOOR, AUX CONTROL FJR476W
	153421	1467668-033	DOOR, AUX CONTROL FJR477F
	151982	1466312-017	DOOR, AUX CONTROL FJR478WR
	158087	1466312-023	DOOR, AUX CONTROL FJR479WR
	153547	1467668-034	DOOR, AUX CONTROL FJR480FR
	138785	1447321-006	GROMMET, FOR KINE SHIELD
	147685	1468408-002	INDICATOR, READOUT
	134207	147746-504	* KNOB, ON/VOL FJR475W,FJR476W
	150352	1468145-501	* KNOB, ON/VOL FJR477F
	145381	1463762-502	MAGNET, BEAM BENDER
	151975	1438482-024	* MASK, CABINET FRONT FJR475W
	158094	1438482-035	* MASK, CABINET FRONT FJR476W
	158090	1439969-029	* MASK, CABINET FRONT FJR477F
	158095	1438482-036	* MASK, CABINET FRONT FJR478WR
	158096	1438482-037	* MASK, CABINET FRONT FJR479WR
	158091	1439969-030	* MASK, CABINET FRONT FJR480FR
	114918	990327-128	NUT, CONTROL MTG
	124338	1403390-405	NUT, SPEAKER MTG
	151414	2841836-505	RES LIGHT DETECTING
	139301	1479290-001	RETAINER, BEAD CHAIN
	117360	1442576-006	RETAINER, INDICATOR
	154435	1479290-011	RETAINER, WIRE TIE
	149552	2871314-002	* SCREW, KINE MTG
	150474	2841923-501	* SHIELD, KINE GOOD

Continued on next page

REPLACEMENT PARTS 1983 CTC 120-S2

Replacement Parts Continued (See Product Safety Note on first page of this parts list)

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION	SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
	156280	1468975-005	SPEAKER, 3 X 5 INCH 32 OHM		158681	2831304-047	* BACK, COVER GJR636P
	159294	1491493-005	SPRING, MCY RETAINER		158682	2831304-039	* BACK, COVER GJR638P
	123895	1442877-101	TERMINAL, FEMALE J1MCR		157490	2831304-028	* BACK, COVER
	153791	2870572-002	TERMINAL, FEMALE P101,P104,P501				GJR657PR,GJR676P, GJR677PR,GJR678P,GJR679PR
	153789	2860025-001	TERMINAL, P401		158614	2831304-045	* BACK, COVER GJR660T,GJR661TR
	158089	1468948-005	WINDOW, IR FJR478WR,FJR479WR		158285	2831304-040	* BACK, COVER GJR668P,GJR669PR
	151979	1466470-006	WINDOW, READOUT FJR475W		158612	2831304-035	* BACK, COVER GJR670T,GJR672TR
	155487	1466470-007	WINDOW, READOUT FJR476W		157613	2831304-029	* BACK, COVER GJR673T,GJR674TR
	153940	1468157-003	WINDOW, TUNING FJR477F			2817320-001	BOOK, INSTRUCTION
	158080	1468158-004	WINDOW, TUNING FJR480FR			2817304-002	GJR636P,GJR638P
	153294	2842008-503	* YOKE			2817321-001	BOOK, INSTRUCTION
							GJR660T,GJR668P, GJR670T,GJR673T,GJR676P, GJR678P
						2817322-001	BOOK, INSTRUCTION
							GJR661TR,GJR669PR, GJR672TR,GJR674TR,GJR677PR, GJR679PR
							CABLE, AC POWER
					154300	2840554-506	CAP, KINE COVER
					156270	1439369-007	CASTER
					128573	1446199-001	CIRCUIT, AUX CONTROL
					154759	2841921-503	GJR636P,GJR638P
							CIRCUIT, AUX CONTROL
					150471	1458752-502	GJR657PR,GJR660T
							GJR661TR,GJR668P,GJR669PR, GJR670T,GJR672TR, GJR673T,GJR674TR,GJR676P, GJR677PR,GJR678P, GJR679PR
							CLAMP, BEAM BENDER/YOKE
					143659	1491017-001	CLIP, INDICATOR MTG
					158671	2844180-001	CLIP, MCY MTG
					141701	1448623-003	CLIP, REMOTE RECEIVER MTG
					147821	2870635-001	DOOR, AUX CONTROL
					159343	2831067-009	GJR636P,GJR638P
							DOOR, AUX CONTROL GJR657PR
					157894	1467638-022	DOOR, AUX CONTROL
					152524	1467638-009	GJR660T,GJR670T, GJR673T
							DOOR, AUX CONTROL
					153887	2860092-001	GJR661TR,GJR672TR,GJR674TR
					157893	1467638-023	DOOR, AUX CONTROL
							GJR668P,GJR676P,GJR678P
					157622	2860092-007	DOOR, AUX CONTROL
							GJR669PR,GJR677PR,GJR679PR
							FRAME, CHASSIS MTG
					153781	1467748-005	GLIDE
					134554	1442093-004	GROMMET, FOR KINE SHIELD
					138785	1447321-006	GROMMET, MST MTG
					143459	1496207-001	HINGE, DOOR
					153785	1491460-005	INDICATOR, READ OUT
					147685	1466408-002	INSERTS, UHF
					154681	2842263-002	INSULATOR, SERVICE CONTROLS
					153782	2860711-001	* INSULATOR, SLEEVE TUNING
					151688	2871897-001	SHAFT
							* KNOB, ON/VOL GJR636P,GJR638P
					151683	1468145-502	* KNOB, ON/VOL
					143735	1495121-514	GJR660T,GJR668P,GJR670T, GJR673T,GJR676P,GJR678P
							KNOB, SELECTOR
					153779	1468199-504	GJR636P,GJR638P
							LATCH, DOOR
					153784	2871947-001	MAGNET, BEAM BENDER
					145381	1463782-502	* MASK, BASIC GJR636P,GJR638P
					158680	1438352-087	* MASK, BASIC GJR657PR
					157895	1438352-099	* MASK, BASIC GJR660T
					158613	1438352-088	* MASK, BASIC GJR661T
					158615	1438352-089	* MASK, BASIC GJR668P
					158284	1438352-073	* MASK, BASIC GJR669PR
					158607	1438352-095	* MASK, BASIC GJR670T,GJR673T
					158280	1438352-065	* MASK, BASIC
					157614	1438352-080	GJR672TR,GJR674TR
							* MASK, BASIC GJR676P,GJR648P
					158286	1438352-079	* MASK, BASIC
					157621	1438352-075	GJR677PR,GJR679PR
							NUT, CONTROL MTG
					114918	990327-128	NUT, SPEAKER MTG
					124338	1403390-405	OVERLAY, CHAN/VOL GJR657PR
					148028	2870627-001	OVERLAY, LOGO GJR660T, GJR668P,GJR670T, GJR673T,GJR676P,GJR678P
					158281	2840515-005	PIN, HINGE
							PULL, DECORATIVE GJR668P, GJR669PR
					153786	1491461-005	PULL, DECORATIVE
					145011		GJR678P,GJR679PR
							RES LIGHT DETECTING
					151414	2841836-505	RETAINER, BEAD CHAIN
					139301	1479290-001	

Continued on next page

1983 CTC 120-S2 REPLACEMENT PARTS/AUXILIARY CONTROL ASSEMBLY

Replacement Parts Continued (See Product Safety Note on first page of this parts list)

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION	SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
	154435	1479290-011	RETAINER, WIRE TIE		153789	2860025-001	TERMINAL, P401
	149552	2871314-001	* SCREW, KINE MTG		154010	2843301-002	TRIM, APRON GJR670T,GJR672TR
	151424	2841874-501	SHIELD, KINE HOOD		153777	2843167-001	WINDOW, READOUT
	153780	2843256-001	* SHIELD, PILOT LIGHT				GJR636P,GJR638P
	148073	1467914-001	SOCKET, CASTER		157500	1468918-007	WINDOW, READOUT GJR657PR
	142947	1468977-005	SPEAKER, 4 X 6 INCH 32 OHM		147985	2870602-001	WINDOW, READOUT
	153787	2843159-001	SPRING, DOOR				GJR660T,GJR6680,GJR670T, GJR673T,GJR676P,GJR678P
	145134	1491493-002	SPRING, MCY RETAINER		153893	2871987-001	WINDOW, READOUT
	141648	1449759-003	STOP, DOOR				GJR661TR,GJR669PR, GJR672TR,GJR674TR,GJR677PR, GJR679PR
	158228	2861642-001	SWIVEL				
	123895	1442877-101	TERMINAL, FEMALE J1MCR				
	153791	2870572-002	TERMINAL, FEMALE P101,P104,P501		153243	1463773-506	* YOKE

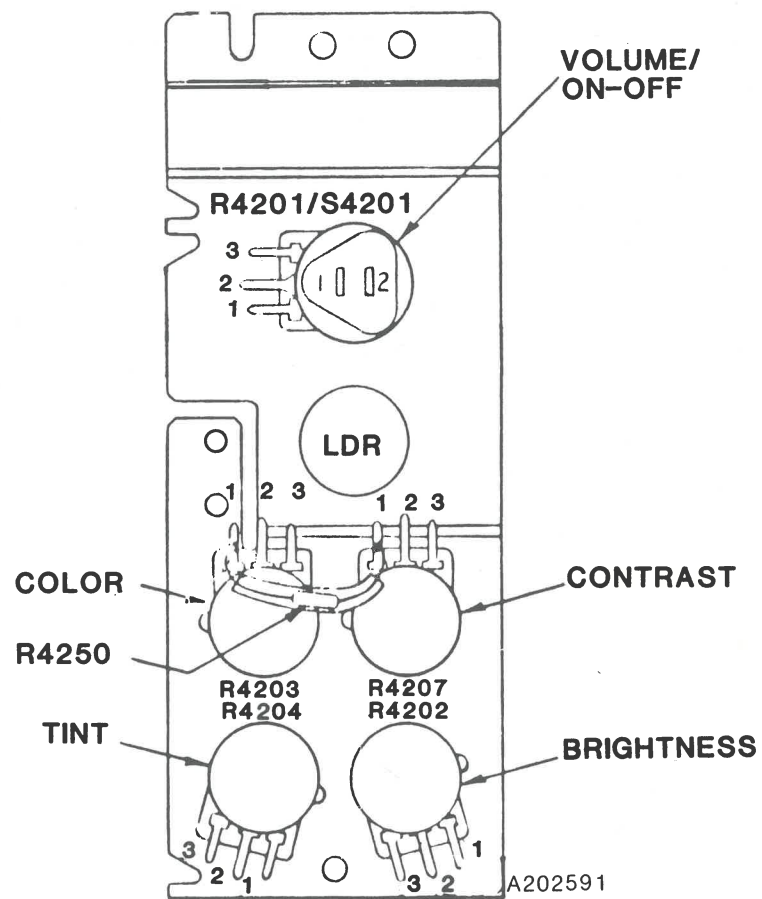


Fig. 5—Auxiliary Control Assembly Models FJR475-FJR476



FILE
1983
CTC 120 — S2 (I)
RCASCO

Color Television Supplement Service Data

CTC 120 Series

RCA Corporation Consumer Electronics

Technical Publications

P.O. Box 1976 | Indianapolis, Indiana 46206

RCA Inc.

Technical Publications

5575 Royalmount Avenue | Town of Mount-Royal | Quebec, Canada H4P 1J8

Canada Stock Numbers:

Add prefix **64** to **Module** stock numbers.

Add prefix **70** to **Tuner** stock numbers.

Add prefix **62** to all **other** stock numbers.

SAFETY NOTICE USE ISOLATION TRANSFORMER WHEN SERVICING

Components having special safety characteristics are identified by shading on schematics and by ★ stars on the parts list in this Service Data and its supplements and bulletins. Before servicing this chassis, it is important that the service technician read and follow the "Safety Precautions" and "Product Safety Notices" in this Service Data.

★ For continued x-radiation protection, replace picture tube with original type or RCA-approved equivalent type. If field replacement of picture tube is required, an ADJUSTABLE TYPE BEAM BENDER must be ordered and installed on the neck of the replacement picture tube. Consult parts list for correct stock number.

Model-To-Major Assembly Cross Reference

MODEL	CHASSIS	TUNER CONTROL	TUNER VHF/UHF	PICTURE TUBE	REMOTE
JJR 960WR	CTC 120A	MSC012RA	MST013RB	★19VLNP22	MCR021A/CRK33C

General Information

Model JJR 960R is designed primarily for Hotel/Motel use.

Tamper-proof screws for the cabinet back. In addition, a cover plate is used to discourage unauthorized service adjustments of the rear panel controls and a security control panel door for the auxiliary controls: Brightness, Color, Black Level, Tint, Program Select/Lock Switch, Add and Erase button.

Note: To gain access to auxiliary controls, a knife or thin screwdriver must be inserted and moved from right to left at the top and bottom of the security control panel door to release the latches holding the hinged door in place.

Adding or Erasing Channels:

- Switch Channel Program Select/Lock Switch to the "Select" position. (In this position no channel will be bypassed when channel selector is pressed.)
- Press the "Up" or "Down" Channel Selector Button until the desired channel is reached. When pressed, the channel will change once and then rapidly scan. Set Volume control at mid-position. If the sound is off, the channel is deleted. If the sound is on, the channel is active.

- To add a channel, press the "Add" button. The sound will come on when channel is active.
- To erase a channel, press the "Erase" button. The sound will go off.
- Proceed to the next channel to be added or erased.
- When programming is completed, return the Channel Program Select/Lock Switch to the "Lock" position. The channel "Up" and "Down" buttons on the set or hand unit will now switch the channels in numerical order and stop only at those channels programmed into the memory. Sound will be off during channel changes.
- Close door after receiver has been programmed.

Volume Limiter Control

- Turn volume limiter fully counter-clockwise.
- Turn receiver on and press the Volume UP button for seven (7) seconds.
- Advance the volume limiter to the desired maximum loudness below where sound is distorted.

This is a Supplement Service Data. It covers model-related information and any exceptions to the Basic Service Data 1983 CTC 120

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CTC 120 Series

Refer to Basic Service Data for additional disassembly instructions.

Cabinet Back Removal

Before removing the cabinet back, read "Safety Precautions" on page 2 of Basic Service Data.

1. Disconnect power cord from AC outlet.
2. Disconnect antenna leads from antenna block assembly.
3. Remove seven (7) screws: Two (2) from top edge of cabinet back, two (2) from rear auxiliary control bracket area, one (1) to right of Sharpness Control and two (2) at bottom edge of cabinet back.

Auxiliary Control Assembly Removal

Remove one (1) screw and pull assembly straight back and out of instrument (remove P107 from chassis). Note: LDR leads are attached to PW 4200 board.

LED Display Removal

Using needle nose pliers grasp spring mounting clip by leaf tab and pull spring clip off plastic mounting stud. Removal of one spring clip is sufficient. An alternate method is to use a thin pointed object and slip under the edge of the spring clip and pry loose from plastic mounting stud. Disconnect P1LED and P2LED connectors from LED Board.

Note: Care is required in removal of the spring clip so as to not break off plastic mounting stud.

LDR Assembly Removal

This assembly is held in place by one (1) $\frac{1}{4}$ " screw. The screw and assembly must be removed from the rear. Note: LDR leads are attached to PW 4200 circuit board.

MCR Removal

Spread spring clips (detented in notches on sides of MCR circuit board) and withdraw board to the rear.

Disconnect cable/connector:

P106 from J106

P1MCR from J1MCR (chassis power)

J2MCR from P2MCR (AC power)

P1SVS from J1SVS

Channel Up/Down Assembly (S4B) Removal

Disconnect P1SVS from J1SVS. Remove two $\frac{1}{4}$ " hex head screws; one from the top and one from the bottom. Withdraw assembly from cabinet.

Frequency Synthesis Tuner and Control Assembly Removal

Remove interconnect plug and cable assemblies.

P1MCR from MCR module.

P1MPS from keyboard assembly.

P1LED from LED Channel Display Assembly.

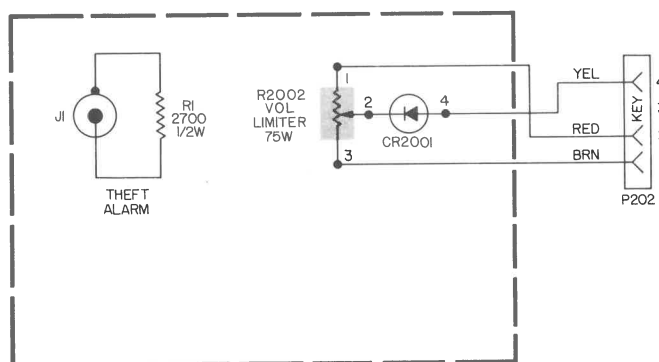
P2LED from LED Channel Display Assembly.

I-F Cable Assembly from J24001 (on MST Tuner Module).

Remove VHF antenna (leads or cable) from antenna block.

Remove UHF antenna leads from UHF terminals.

Remove one (1) $\frac{1}{4}$ " hex head screw at rear of tuning assembly and remove one (1) $\frac{1}{4}$ " hex head screw at front of assembly (below P2MSC connector). Pull assembly back slightly and lift out of instrument.



Volume Limiter/Theft Alarm

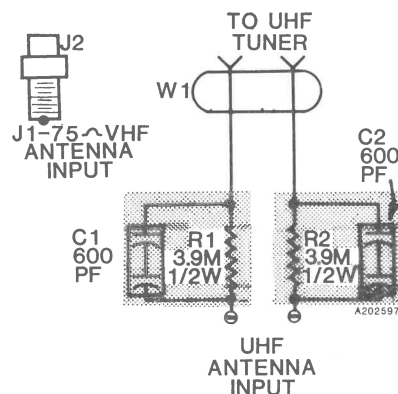


Fig. 1 — Antenna Block

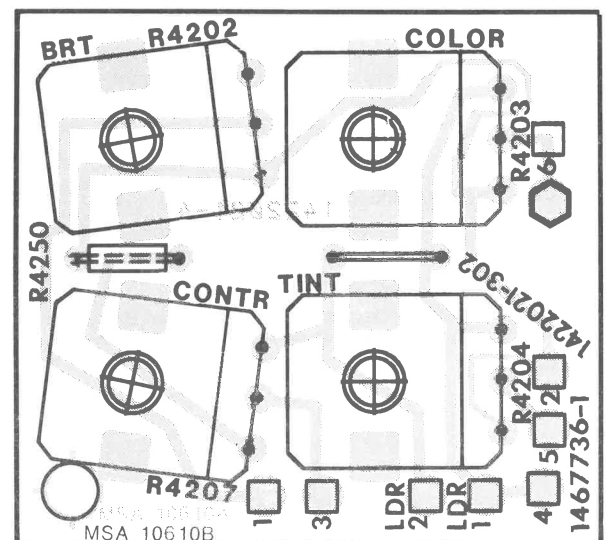


Fig. 2 — Auxiliary Control Circuit Board

REPLACEMENT PARTS

BEFORE REPLACING PARTS, READ THE FOLLOWING:

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Warranty replacement of cabinet parts requires prior approval of RCA.

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PRODUCT SAFETY NOTE—Components marked with a (★) have special characteristics important to safety. Before replacing any of these components, read carefully the **PRODUCT SAFETY NOTICE** in the Basic Service Data. Do not degrade the safety of the set through improper servicing. Although assemblies as a whole may not be marked with a (★), replacement of RCA assemblies with other assemblies not RCA approved may result in a safety hazard.

Canada Stock Numbers:

Add prefix **64** to **Module** stock numbers.

Add prefix **70** to **Tuner** stock numbers.

Add prefix **62** to **all other** stock numbers.

.....AVOID REPLACEMENT PART ERRORS.....

File supplements and addendums immediately upon receipt, and consult the parts lists in them before ordering parts.

NOTE: For complete coverage of all parts and assemblies used in instruments equipped with the chassis series to which this service data relates, consult the following publications:

● **Basic Service Data**—Chassis and tuning systems and most related parts and assemblies that do not differ from one model or model group to another.

● **Service Data Supplements**—Cabinet, auxiliary, and other parts and assemblies that differ from one model group to another.

● **Service Data Addendum**—Any parts additions, deletions, or other changes made after initial production.

Do not replace or order parts without first consulting any Addendum(s) that may have been issued since publication of this service data.

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
---------------	--------------	----------------	-------------

TUNING SYSTEM ASSEMBLIES

TUNER ASSEMBLY

MST013RB

**MST013RB SAME AS MST007 PREVIOUSLY ISSUED IN 1983
CTC120 EXCEPT AS LISTED.**

MST 013RB	156335	2841828-504	MODULE COMPLETE
	157139	1477018-539	CABLE, COAXIAL
	157951	2830509-002	COVER, OUTER
	157830	2841830-004	SPRING, BOTTOM COVER
	157828	2841830-005	SPRING, BOTTOM COVER
	157829	2841829-002	SPRING, LARGE "V"
	157831	2871399-002	SPRING, TOP COVER

REMOTE CONTROL ASSEMBLY

MCR021A

MCR 021A	156444	1458780-509	MODULE COMPLETE
C1	143879	1491407-92M	CAPCD 1000PF K Z5P 50V
C2	145405	2840362-142	CAP LYTC 10UF N 25V
C3	141868	2840361-162	CAP LYTC 1UF N 50V
C4	145405	2840362-142	CAP LYTC 10UF N 25V
C5	143882	1491409-32M	CAPCD .01UF K Z5P 50V
C6	139444	993286-075	CAP POLY .1UF K 100V
C7	150709	2841239-003	CAPCD 1800PF K NPO 50V
C8	143879	1491407-92M	CAPCD 1000PF K Z5P 50V
C9	139444	993286-075	CAP POLY .1UF K 100V
C11	148501	2840362-242	CAP LYTC 15UF N 25V
C12	143882	1491409-32M	CAPCD .01UF K Z5P 50V
C13	143879	1491407-92M	CAPCD 1000PF K Z5P 50V
C14	143879	1491407-92M	CAPCD 1000PF K Z5P 50V
C15	150710	1472442-001	CAP POLY 1000PF M 200V
C16	150710	1472442-001	CAP POLY 1000PF M 200V
C17	143879	1491407-92M	CAPCD 1000PF K Z5P 50V
C18	143879	1491407-92M	CAPCD 1000PF K Z5P 50V
C19	141868	2840361-162	CAP LYTC 1UF N 50V
C20	143879	1491407-92M	CAPCD 1000PF K Z5P 50V
C21	143882	1491409-32M	CAPCD .01UF K Z5P 50V

CR1	150711	2811592-003	DIODE
CR2	119597	1471872-006	DIODE
CR3	119597	1471872-006	DIODE
CR5	119597	1471872-006	DIODE
CR6	119597	1471872-006	DIODE

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
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L1	150713	1445867-007	COIL 10MH
P106	157380	2861605-302	CONNECTOR 5 PIN
P1SVS	153364	2860742-004	CONNECTOR 5 PIN
Q1	133218	1417343-002	TRANSISTOR PREAMP
Q2	133218	1417343-002	TRANSISTOR PREAMP
Q3	145410	1417330-011	TRANSISTOR PREAMP
Q4	119635	1417333-001	TRANSISTOR PREAMP
Q5	156372	1417318-009	TRANSISTOR ON/OFF
Q6	146847	1417306-013	TRANSISTOR VOLUME
Q7	141343	1417330-004	TRANSISTOR VOL/EMITTER
Q8	146847	1417306-013	TRANSISTOR ON/OFF INVERTER
R4	829510	993218-469	RES CF 1/4W 5% 1M
R13	829522	993218-477	RES CF 1/4W 5% 2.2M
S4201	159784	2841943-502	SWITCH ASSEMBLY
U1	152805	1421762-002	IC DECODER
Y1	145165	1422271-001	CRYSTAL
	150707	1468955-001	COVER, PREAMP
	150708	1468956-001	REFLECTOR, PHOTO DIODE
	139301	1479290-001	RETAINER, BEAD CHAIN

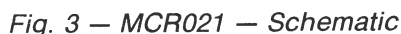
INSTRUMENT ASSEMBLY

JJR960WR

C1	147918	2870697-210	★ CAPCD 600PF M Z5U 1.4KV
C2	147918	2870697-210	★ CAPCD 600PF M Z5U 1.4KV
C424	156249	2843149-502	CAP WIDTH ASSEMBLY
CR2002	119597	1471872-006	DIODE
F101	154521	2813593-001	★ FUSE 5A
J1	150722	2871835-002	★ CONNECTOR
L101	154301	1496553-504	★ COIL
L102	148491	1463890-507	★ COIL DEGAUSSING
P2MSC	158237	2861607-305	CONNECTOR
P104	158677	2861681-008	CONNECTOR DEGAUSSING
P201	157814	2861602-300	CONNECTOR
P302	158237	2861607-305	CONNECTOR
P401	153788	2831216-001	★ CONNECTOR QUAD YOKE
P501	158678	2861681-001	★ CONNECTOR DUAL YOKE
P701	158238	2861607-306	CONNECTOR
R118	147872	945313-160	RES REMOTE POWER
R2002	156408	1472268-043	★ RES CONTROL VOL LMTR
R4202	147612	1473369-002	★ RES CONTROL BRIGHTNESS
R4203	147613	1473369-004	★ RES CONTROL COLOR

Continued on next page

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION	SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
R4204	147613	1473369-004	★ RES CONTROL TINT			2817346-001	INSTRUCTIONS
R4207	149925	1473369-005	★ RES CONTROL CONTRAST	145381	1463762-502		MAGNET, BEAM BENDER
				159770	2830356-029	★	MASK, CABINET FRONT
SB3	153837	2842234-504	SWITCH PROGRAM	114918	990327-128		NUT, CONTROL MTG
SB4	159768	2842237-507	SWITCH CHANNEL UP/DOWN	124338	1403390-405		NUT, SPEAKER MTG
				155666	2860762-001		OVERLAY, DOOR
V101		2814626-001	★ PICTURE TUBE 19VLNP22	155667	2860760-001		OVERLAY, SPEAKER
				147696	1458751-502		RELAY
	155648	2830357-004	★ BACK, CABINET	151414	2841836-505		RES LIGHT DETECTING
	155636	2843306-502	BLOCK, ANTENNA COUPLING	117360	1442576-006		RETAINER, INDICATOR
	153435	1467652-001	BRACKET, CHASSIS MTG	139301	1479290-001		RETAINER, BEAD CHAIN
	159767	2870517-006	★ BUTTON, ON/OFF	113348	990300-012		RETAINER, SPRING J TYPE
	155651	2840554-507	CABLE, AC POWER	154435	1479290-011		RETAINER, WIRE TIE
	150471	1458752-502	CIRCUIT, AUX CONTROL	149552	2871314-002	★	SCREW, KINE MTG
	153659	1491017-001	CLAMP, BEAM BENDER	150474	2841923-501	★	SHIELD, KINE HOOD
	149902	1491071-002	CLAMP, YOKE	156280	1468975-005		SPEAKER, 3 X 5 INCH 32 OHM
	147821	2870635-001	CLIP, REMOTE RECEIVER MTG	155655	2871319-002		SPRING, DOOR LATCH
	128746	1445444-001	CONNECTOR	159768	2842237-507		SWITCH, CHAN/VOL
	149438	2841265-001	COVER, SET UP CONTROLS	153837	2842234-504		SWITCH, PROGRAM
	149903	2870908-001	CUSHION, WEDGE YOKE ADJ	157160	2870558-003		TERMINAL, ANTENNA
	155664	2831343-001	DOOR, AUX CONTROL	153791	2870572-002		TERMINAL, P104,P501
	138785	1447321-006	GROMMET, FOR KINE SHIELD	153789	2860025-001		TERMINAL, P401
	150190	1468938-001	HINGE, DOOR	159766	2872893-001		WINDOW, TUNING
	147685	1466408-002	INDICATOR, READ OUT	153294	2842008-503	★	YOKE





FILE
1983
CTC 120 — S3

Color Television Supplement Service Data

CTC 120 Series

RCA Corporation Consumer Electronics

Technical Publications
P.O. Box 1976 | Indianapolis, Indiana 46206

RCA Inc.

Technical Publications
5575 Royalmount Avenue | Town of Mount-Royal | Quebec, Canada H4P 1J8

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Model-To-Major Assembly Cross Reference

MODEL	CHASSIS	TUNER CONTROL	TUNER VHF/UHF MULTIBAND	PICTURE TUBE	REMOTE
✓ FGC 468WR	CTC 120A	MSC012RA	MST007RA	★19VLNP22	MCR015AREV1/CRK33H
✓ FJR 484WR	CTC 120A	MSC013RA	MST007RA	★19VLNP22	MCR016RA/CRK28G
✓ FJR 530PR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR016RA/CRK28G

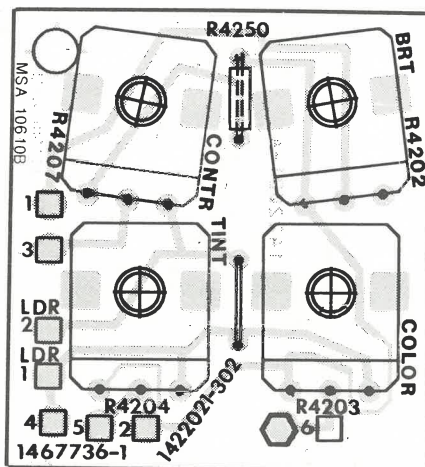


Fig. 1 — Auxiliary Control Circuit Board

This is a Supplement Service Data. It covers model-related information and any exceptions to the Basic Service Data 1983 CTC 120

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CTC 120 Series

See Basic Service Data for additional disassembly instructions.

Auxiliary Control Assembly Removal

Remove one 1/4" hex head screw. Pull assembly straight back and out of instrument (remove P701 from chassis).

Note: LDR leads are attached to PW 4200 board.

Frequency Synthesis Tuner and Control Assembly Removal

Remove interconnect plug and cable assemblies.

P2MSC from J2MSC (on MSC module).

P2BCD (remote version) from Channel Switch Assembly.

P1MCR (remote version) from MCR module.

P1MPS (remote version) from keyboard assembly.

P1LED from LED Channel Display Assembly.

P2LED from LED Channel Display Assembly.

P3MSC From MSC assembly

I-F Cable Assembly from J24001 (on MST Tuner Module).

P1101 From MCR016A

Remove VHF antenna (leads or cable) from antenna block.

Remove UHF antenna leads from UHF terminals.

Remove one (1) 1/4" hex head screw at rear of tuning assembly and remove one (1) 1/4" hex head screw at front of assembly (below P2MSC connector). Pull assembly back slightly and lift out of instrument.

LED Display Removal

Using needle nose pliers grasp spring mounting clip by leaf tab and pull spring clip off plastic mounting stud. Removal of one

spring clip is sufficient. An alternate method is to use a thin pointed object and slip under the edge of the spring clip and pry loose from plastic mounting stud. Disconnect P1LED and P2LED connectors from LED Board.

Note: Care is required in removal of the spring clip so as to not break off plastic mounting stud.

MCR 015/017 Removal

Push spring clips (detented in notches on sides of MCR circuit board and withdraw board to the rear. Disconnect P106 (from J106 on chassis, P3MCR (from keyboard) and P1MCR (from MSC module).

MCR016 Removal

Disconnect P1101 and P1103.

Remove one screw at front of assembly. Slide assembly forward and lift up.

LDR Assembly Removal

This assembly is held in place by one (1) 1/4" screw. The screw and assembly must be removed from the rear.

Keyboard Assembly Removal

Remove the manual keyboard (manual versions) and remote tuning switch keyboard (remote versions) by first removing four (4) 1/4" screws. Disconnect P1MPS, P2BCD connectors and P3MCR (P1SVS). The assembly can then be removed from rear of the cabinet front.

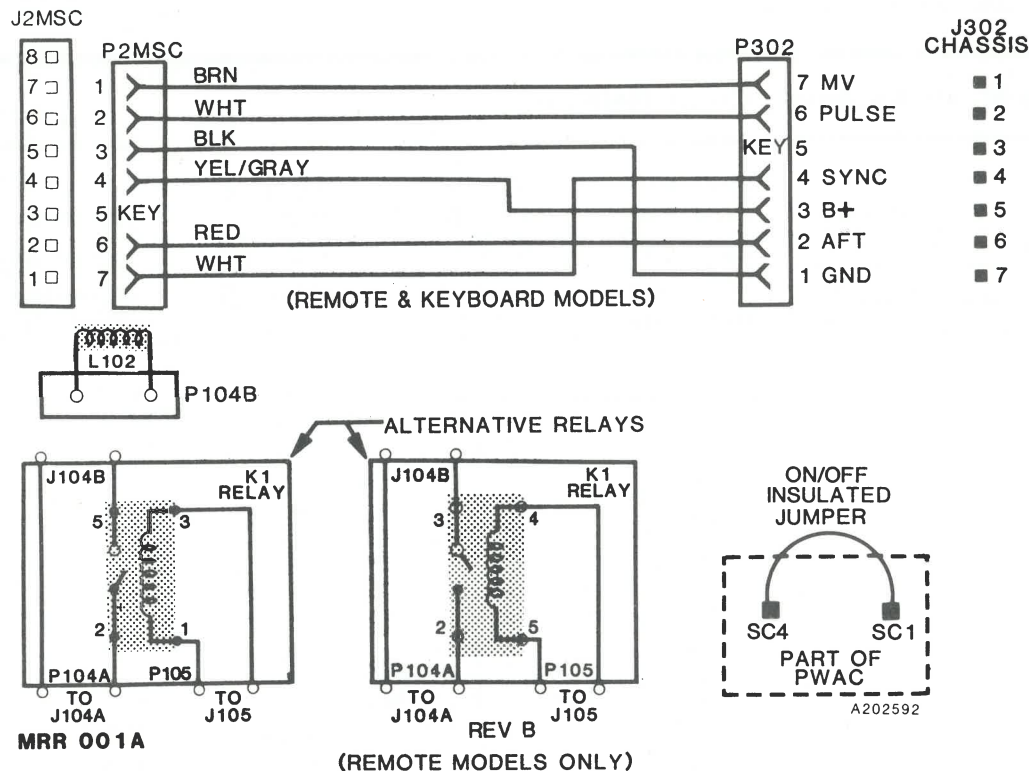


Fig. 2 — Interconnect Diagram

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Canada Stock Numbers:

Add prefix **64** to **Module** stock numbers.

Add prefix **70** to **Tuner** stock numbers.

Add prefix **62** to **all other** stock numbers.

.....AVOID REPLACEMENT PART ERRORS.....

File supplements and addendums immediately upon receipt, and consult the parts lists in them before ordering parts.

NOTE: For complete coverage of all parts and assemblies used in instruments equipped with the chassis series to which this service data relates, consult the following publications:

● **Basic Service Data**—Chassis and tuning systems and most related parts and assemblies that do not differ from one model or model group to another.

● **Service Data Supplements**—Cabinet, auxiliary, and other parts and assemblies that differ from one model group to another.

● **Service Data Addendum**—Any parts additions, deletions, or other changes made after initial production.

Do not replace or order parts without first consulting any Addendum(s) that may have been issued since publication of this service data.

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
INSTRUMENT ASSEMBLIES			
		FGC468WR	
		FJR484WR	
		FJR530PR	
C424	156249	2843149-502	CAP WIDTH ASSEMBLY
F101	154521	2813593-001	★ FUSE 5A
J1MCR	118750	1461635-013	CONNECTOR
K1	147696	1458751-502	RELAY
L101	154301	1496553-504	★ COIL
L102	148491	1463890-507	★ COIL DEGAUSSING
		FGC468WR,FJR484WR	
L102	148493	1463890-509	★ COIL DEGAUSSING FJR530PR
P1SVS	157824	2860742-005	CONNECTOR
P2MSC	158237	2861607-305	CONNECTOR
P104	158677	2861681-008	CONNECTOR
P201	157814	2861602-300	CONNECTOR
P302	158237	2861607-305	CONNECTOR
P401	153788	2831216-001	★ CONNECTOR QUAD YOKE
P501	158678	2861681-001	★ CONNECTOR DUAL YOKE
P1103	158679	2861623-208	CONNECTOR
R118	147872	945313-160	RES REMOTE POWER
R4202	147612	1473369-002	★ RES CONTROL BRIGHTNESS
R4203	147613	1473369-004	★ RES CONTROL COLOR
R4204	147613	1473369-004	★ RES CONTROL TINT
R4207	149925	1473369-005	★ RES CONTROL CONTRAST
S8B	153429	2841813-507	SWITCH TUNING
		FGC468WR,FJR484WR	
S8B	153982	2841813-505	SWITCH TUNING FJR530PR
V101		2814626-001	★ PICTURE TUBE 19VLPN22
V101		2814627-001	★ PICTURE TUBE 25VGP22
	10E0113	1472698-003	ANTENNA, UHF
	156265	1467201-003	ANTENNA, VHF
	157407	1439970-006	★ BACK, CABINET
		FGC468WR,FJR484WR	
	159351	2831304-048	★ BACK, COVER FJR530PR
		2816010-002	BOOK, INSTRUCTION FGC468WR

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
		2817337-001	BOOK, INSTRUCTION FJR484WR
		2817322-001	BOOK, INSTRUCTION FJR530PR
	154300	2840554-506	CABLE, AC POWER
	156270	1439369-007	CAP, KINE COVER
	150471	1458752-502	CIRCUIT, AUX CONTROL
	143659	1491017-001	CLAMP, BEAM BENDER
	149902	1491071-002	CLAMP, YOKE
	141701	1448623-003	CLIP, MCY MTG
	147821	2870635-001	CLIP, REMOTE RECEIVER MTG
	151991	2841270-001	CUSHION, DOOR
	149903	2870908-001	CUSHION, WEDGE YOKE ADJ
	151416	1467668-014	DOOR, AUX CONTROL
		FGC468WR,FJR484WR	
		DOOR, AUX CONTROL FJR530PR	
	157154	2860092-008	DOOR, AUX CONTROL FJR530PR
	103480	1442221-001	FLANGE, LEG MTG FJR530PR
	138738	1472656-001	FOOT, CABINET FJR530PR
	138785	1447321-006	GROMMET, FOR KINE SHIELD
	143459	1496207-001	GROMMET, MST MST
	147685	1466408-002	INDICATOR, READ OUT
	153782	2860711-001	INSULATOR, SERVICE CONTROLS
	145381	1463762-502	MAGNET, BEAM BENDER
	159352	1438352-200	★ MASK, BASIC FJR530PR
	158092	1439969-031	★ MASK, CABINET FRONT
		FGC468WR	
	159350	1439969-033	★ MASK, CABINET FRONT
		FJR484WR	
	124338	1403390-405	NUT, SPEAKER MTG
	151414	2841836-505	RES LIGHT DETECTING
	117360	1442576-006	RETAINER, INDICATOR
	139301	1420183-004	RETAINER, BEAD CHAIN
	154435	1479290-011	RETAINER, WIRE TIE
	149552	2871314-002	★ SCREW, KINE MTG
	150474	2841923-501	★ SHIELD, KINE HOOD
		FGC468WR,FJR484WR	
	151424	2841874-501	★ SHIELD, KINE HOOD FJR530PR
	156280	1468975-005	SPEAKER, 3 X 5 INCH 32 OHM
		FGC468WR,FJR484WR	
	142947	1468977-005	SPEAKER, 4 X 6 INCH 32 OHM
		FJR530PR	
	159294	1491493-005	SPRING, MCY RETAINER
		FJR484WR	
	145134	1491493-002	SPRING, MCY RETAINER
		FJR530PR	
	141648	1449759-003	STOP, DOOR
	153971	2870572-002	TERMINAL, DUAL YOKE
	123895	1442877-101	TERMINAL, J1MCR
	153791	2870572-002	TERMINAL, P104
	153789	2860025-001	TERMINAL, QUAD YOKE
	158080	1468158-004	WINDOW, IR
		FGC468WR,FJR484WR	
	153893	2871987-001	WINDOW, READOUT FJR530PR
	153294	2842008-503	★ YOKE FGC468WR,FJR484WR
	153243	1463773-506	★ YOKE FJR530PR



FILE
1983
CTC 120 — S3 (I)
RCASCO

Color Television Supplement Service Data

CTC 120 Series

RCA Corporation Consumer Electronics

Technical Publications
P.O. Box 1976 | Indianapolis, Indiana 46206

RCA Inc. Technical Publications

5575 Royalmount Avenue | Town of Mount-Royal | Quebec, Canada H4P 1J8

Canada Stock Numbers:

Add prefix **64** to **Module** stock numbers.

Add prefix **70** to **Tuner** stock numbers.

Add prefix **62** to **all other** stock numbers.

SAFETY NOTICE

USE ISOLATION TRANSFORMER WHEN SERVICING

Components having special safety characteristics are identified by shading on schematics and by ★ stars on the parts list in this Service Data and its supplements and bulletins. Before servicing this chassis, it is important that the service technician read and follow the "Safety Precautions" and "Product Safety Notices" in the Basic Service Data.

★ For continued x-radiation protection, replace picture tube with original type or RCA-approved equivalent type. If field replacement of picture tube is required, an ADJUSTABLE TYPE BEAM BENDER must be ordered and installed on the neck of the replacement picture tube. Consult parts list for correct stock number.

Model-To-Major Assembly Cross Reference

MODEL	CHASSIS	TUNER CONTROL	TUNER UHF/VHF	PICTURE TUBE	RADIO
JJR967W,B	CTC120A	MSC 016RA	MST 013RB	★19VLNP22	RC 3042

NOTE: MST 013 SAME AS MST 007 EXCEPT ANTENNA BLOCK ASSEMBLY.

General Information

Model JJR 967 is designed primarily for Hotel/Motel use. It employs tamper-proof screws for the cabinet back.

This receiver is equipped with a Volume Limiter control, a theft alarm jack and a cover plate for the service controls to discourage unauthorized service adjustments.

Volume Limiter

Turn volume limiter, (located on the rear of the chassis) to mid-range. Turn Volume Control fully clockwise. Now turn Volume Limiter control for maximum desired volume.

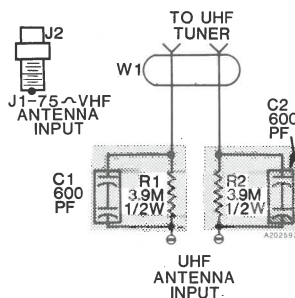


Fig. 1 — Antenna Block Assembly MST013

This is a Supplement Service Data. It covers model-related information and any exceptions to the Basic Service Data 1983 CTC 120

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CTC 120 Series

Instruments Required**Signal Sources**

1. R-F Signal Sweep Generator
2. TV/FM Sweep Generator
3. Marker Generator
4. DC Power Supply (12V DC)

Output Indicators

1. Electronic Voltmeter
2. Oscilloscope

General Alignment Conditions

1. Signal input must be kept as low as possible to avoid overload and clipping. (Use highest possible sensitivity of output indicator.)
2. Markers must be accurate (crystal controlled or calibrated). The 10.7 MHz marker used in each section of the FM alignment must be the same. (Generator dial should not be moved.)

AM ALIGNMENT

Note: Connect DC power supply (11.5V) to TP4 and TP8.

Connect Signal Source to—	Connect Output Indicator to—	Set Signal to—	Set Radio Dial to—	Adjust	Adjust for—
Set “Function” Switch to AM					
Signal generator connected to a loop or short piece of wire placed near AM antenna	E.V.M. oscilloscope connected to TP 102	or to	455 kHz (modulated)	tuning gang open	T107, T108, T109
			525 kHz (modulated)	525 kHz	L106
			1600 kHz (modulated)	1600 kHz	CT 104
			1400 kHz (modulated)	1400 kHz (rock gang)	CT 103
Repeat above steps as necessary to obtain maximum sensitivity					

FM ALIGNMENT

Note: Connect DC power supply (11.5V) to TP3.

Connect Signal Source to—	Connect Output Indicator to—	Set Signal to—	Set Radio Dial to—	Adjust	Adjust for—	
Set "Function" Switch to FM and detune ratio detector T106						
FM sweep generator to TP 101.	Oscilloscope connected to TP 103.	10.7 MHz (unmodulated)	Gang open	T103	T104	maximum gain with symmetrical curve peaked at 10.7 MHz marker
				T101	T102	
					T105	
		10.6, 10.7, 10.8 MHz Markers		T106 and retouch T105		Straightness and symmetry of "S" curve with 10.7 MHz marker at zero crossover
Repeat above steps as necessary to obtain maximum sensitivity						
Marker generator loosely coupled to FM antenna (TP1 and TP2).	E.V.M.connected to TP 103.	88 MHz (modulated)	88 MHz	L104	Maximum	
		108 MHz (modulated)	108 MHz	CT 102		
		90 MHz (modulated)	90 MHz	L102		
		106 MHz (modulated)	106 MHz	CT 101		
Repeat above steps as necessary to obtain maximum sensitivity						



7

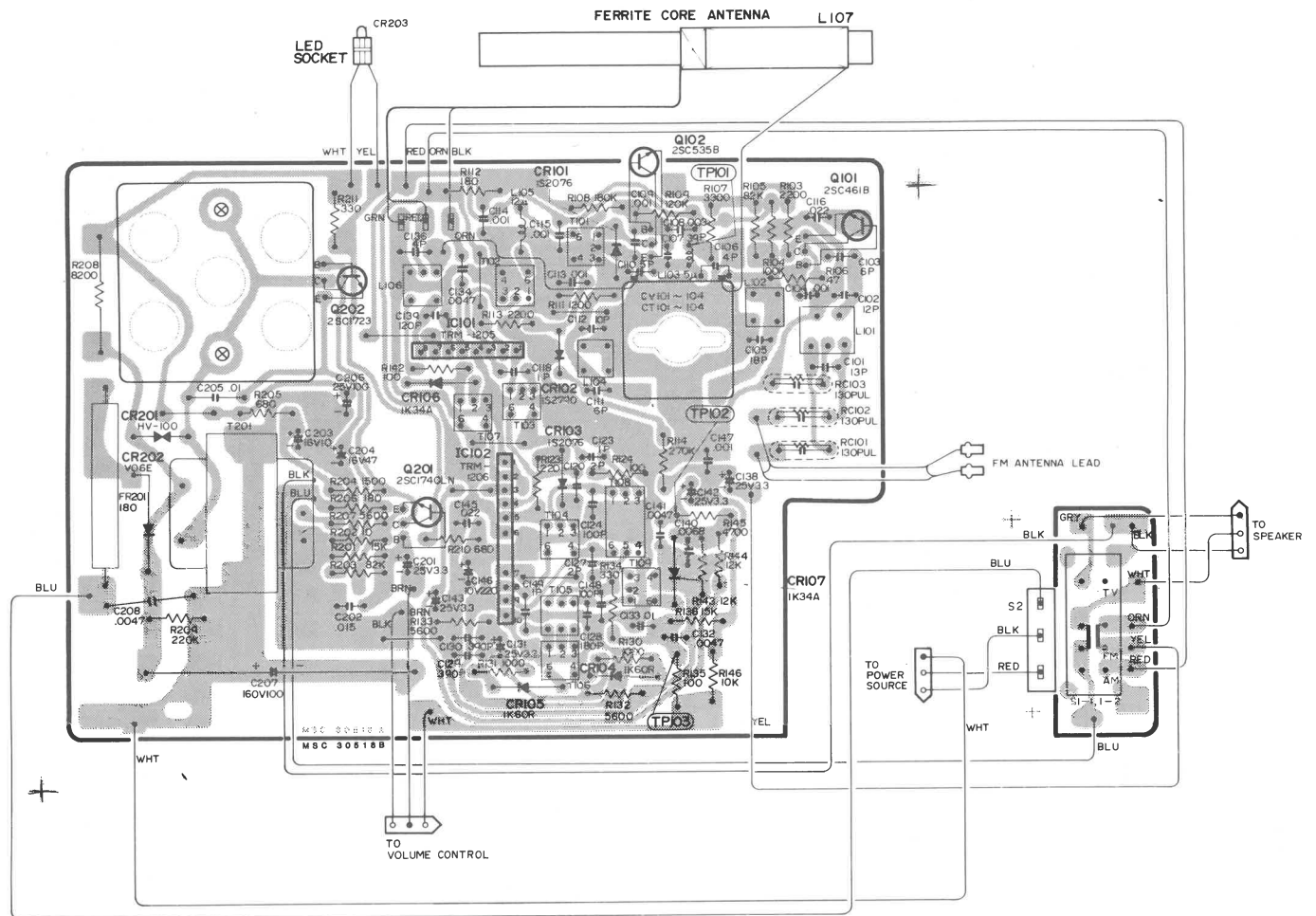


Fig. 3 — RC 3042 Circuit Board Assembly Layout and Interconnect Wiring

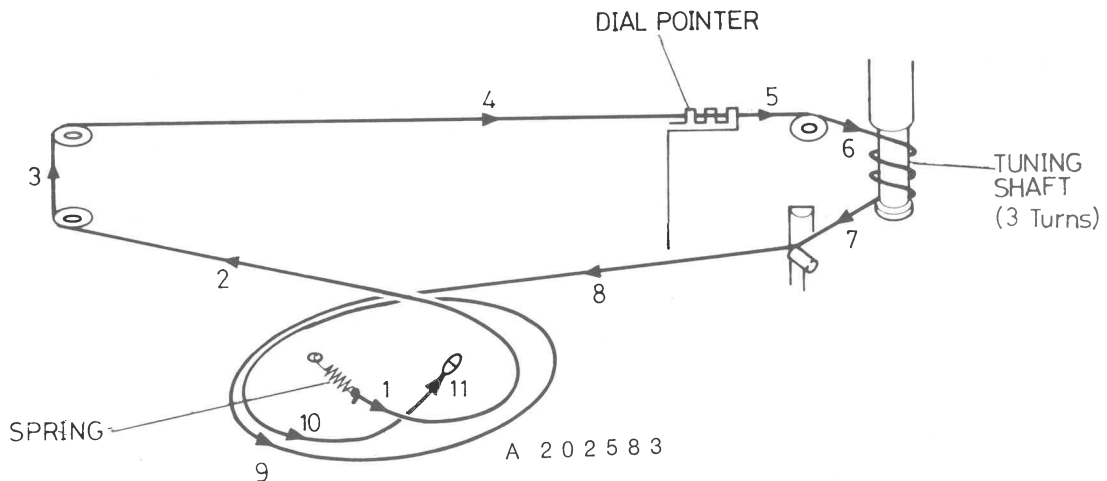


Fig. 4 — RC 3042 Dial Cord Stringing

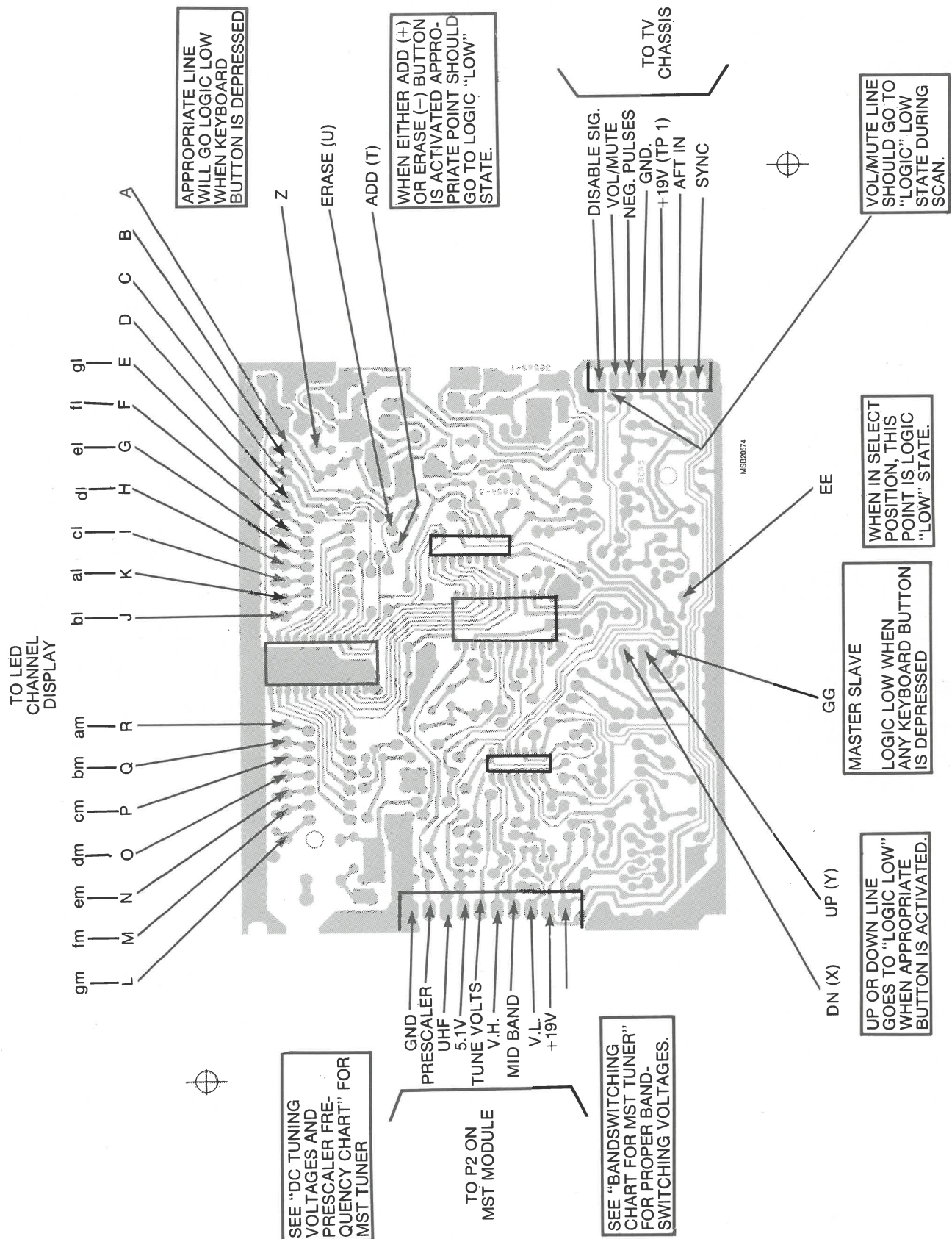


Fig. 7 — MSC 016 Circuit Board Bottom View

BEFORE REPLACING PARTS, READ THE FOLLOWING:

RCA-Approved Substitute Stock Numbers—Before ordering stock numbers in this parts list, look for an RCA-approved substitute stock number in the current *RCA Distributor & Special Products Price Schedule*. This will minimize your service time and avoid ordering parts you already have in stock.

See your RCA Distributor for Replacement Parts and Accessories.

Warranty Status of Assemblies and Parts—The warranty status of some assemblies and parts are indicated by one of the following Warranty Status Codes:

- Complete assembly not eligible for warranty exchange or replacement.
- † Eligible for warranty exchange for new or rebuilt unit.
- ‡ Complete assembly eligible for warranty replacement with new or rebuilt unit.

.....AVOID REPLACEMENT PART ERRORS.....

File supplements and addendums immediately upon receipt, and consult the parts lists in them before ordering parts.

NOTE: For complete coverage of all parts and assemblies used in instruments equipped with the chassis series to which this service data relates, consult the following publications:

All parts listed without a Warranty Status Code symbol are eligible for warranty replacement as discrete components.

Warranty replacement of cabinet parts requires prior approval of RCA.

Warranty Status and Specifications of assemblies and parts are subject to change without notice.

PRODUCT SAFETY NOTE—Components marked with a (*) have special characteristics important to safety. Before replacing any of these components, read carefully the **PRODUCT SAFETY NOTICE** in the Basic Service Data. Do not degrade the safety of the set through improper servicing. Although assemblies as a whole may not be marked with a (*), replacement of RCA assemblies with other assemblies not RCA approved may result in a safety hazard.

Canada Stock Numbers:

Add prefix **64** to **Module** stock numbers.

Add prefix **70** to **Tuner** stock numbers.

Add prefix **62** to all other stock numbers.

• **Basic Service Data**—Chassis and tuning systems and most related parts and assemblies that do not differ from one model or model group to another.

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SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
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TUNING SYSTEM ASSEMBLIES

TUNER ASSEMBLY

MST013RB

MST013RB SAME AS MST007 PREVIOUSLY ISSUED IN 1983 CTC120 EXCEPT AS LISTED.

MST 013RB	156335	2841828-504	MODULE COMPLETE
	157139	1477018-539	CABLE, COAXIAL
	157951	2830509-002	COVER, OUTER
	157830	2841830-004	SPRING, BOTTOM COVER
	157828	2841830-005	SPRING, BOTTOM COVER
	157829	2841829-002	SPRING, LARGE "V"
	157831	2871399-002	SPRING, TOP COVER

TUNER CONTROL ASSEMBLY

MSC016RA

MSC 016RA	149699	2841955-501	MODULE COMPLETE
C2501	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
C2502	147635	1491916-363	CAPCD 130PF J NPO 50V
C2503	147630	1491123-017	CAPCD 36PF G NPO 250V
C2505	148870	2871335-085	CAP POLY .68UF K 100V
C2506	157372	1449706-021	CAP POLY .22UF K 75V
C2507	134778	1472442-069	CAP POLY .033UF K 100V
C2508	148871	1472442-056	CAP POLY .0027UF K 200V
C2509	143752	2840363-531	CAP LYTC 470UF R 16V
C2510	142768	1490136-41R	CAPCD .01UF M Z5V 250V
C2511	143751	2840362-661	CAP LYTC 68UF R 50V
C2512	143752	2840363-531	CAP LYTC 470UF R 16V
C2513	154510	945354-002	CAPCD .01UF P Z5U 500V
C2514	146296	1449706-011	CAP POLY .015UF J 200V
C2515	143549	2840362-351	CAP LYTC 22UF R 35V
C2516	143759	1490135-11N	CAPCD 1000PF M Z5U 250V
C2517	143759	1490135-11N	CAPCD 1000PF M Z5U 250V
C2518	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
C2519	145733	2840392-62H	CAPCT 100PF K N750 50V
C2520	146297	1449706-010	CAP POLY .047UF J 200V
C2521	139441	1472442-063	CAP POLY .01UF K 200V
C2523	143758	1490134-72M	CAPCD 560PF K Z5P 250V
C2524	132443	1472442-071	CAP POLY .047UF K 100V

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
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C2526	143752	2840363-531	CAP LYTC 470UF R 16V
C2531	142772	2840362-163	CAP LYTC 10UF M 50V
C2532	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
C2533	146439	2841288-363	CAP LYTC .47UF M 50V
C2534	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
C2535	142768	1441023-121	CAPCD .01UF M Z5V 100V
C2536	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2538	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2539	142768	1441023-121	CAPCD .01UF M Z5V 100V
C2540	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
C2541	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2544	146764	1491407-30M	CAPCD 330PF Z Z5P 50V
C2545	146764	1491407-30M	CAPCD 330PF Z Z5P 50V
C2546	146764	1491407-30M	CAPCD 330PF Z Z5P 50V
C2547	146764	1491407-30M	CAPCD 330PF Z Z5P 50V
C2553	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2554	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2556	142768	1490136-41R	CAPCD .01UF M Z5V 250V
C2557	142768	1490136-41R	CAPCD .01UF M Z5V 250V
C2558	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2561	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2562	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2563	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2564	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2565	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2566	142768	1441023-121	CAPCD .01UF M Z5V 100V
C2570	143759	1490135-11N	CAPCD 1000PF M Z5U 250V
C2573	142768	1490136-41R	CAPCD .01UF M Z5V 250V
C2575	142768	1490136-41R	CAPCD .01UF M Z5V 250V
C2577	148873	2840362-181	CAP LYTC 10UF R 100V
C2580	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2581	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2582	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2583	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2584	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2585	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2586	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
C2588	146272	2840362-333	CAP LYTC 22UF M 16V
C2589	145169	2840362-423	CAP LYTC 33UF M 10V

CR2501	139706	1471872-008	DIODE
CR2502	156313	2870486-002	DIODE ZENER 30V
CR2503	142569	1476171-031	DIODE
CR2504	149797	1477046-028	DIODE ZENER 5.1V
CR2505	139706	1471872-008	DIODE
CR2506	139706	1471872-008	DIODE
CR2507	152869	1471898-014	DIODE ZENER 35V
CR2508	142569	1476171-031	DIODE
CR2509	119597	1471872-006	DIODE
CR2510	119597	1471872-006	DIODE
CR2511	147015	99203-208	DIODE
CR2513	119597	1471872-006	DIODE
CR2515	119597	1471872-006	DIODE
CR2516	145817	99202-217	DIODE ZENER 11V
CR2518	130047	99201-116	DIODE ZENER 10V
CR2519	119597	1471872-006	DIODE
CR2520	119597	1471872-006	DIODE
CR2521	119597	1471872-006	DIODE
CR2522	119597	1471872-006	DIODE

Continued on next page

Replacement Parts Continued (See Product Safety Note on first page of this parts list)

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
CR2525	119597	1471872-006	DIODE
CR2526	119597	1471872-006	DIODE
CR2527	119597	1471872-006	DIODE
CR2528	119597	1471872-006	DIODE
CR2531	143595	1476179-005	DIODE
CR2534	119597	1471872-006	DIODE
CR2535	119597	1471872-006	DIODE
CR2536	119597	1471872-010	DIODE
CR2540	119597	1471872-010	DIODE
FB2501	126875	1443391-005	BEAD
FB2502	126875	1443391-005	BEAD
J2501	151980	2860051-019	CONNECTOR 10 PIN
J2502	150700	2860056-301	CONNECTOR 8 PIN
L2502	153411	1447018-012	COIL 1.8UH
L2509	156370	2872884-042	COIL 10UH
L2511	146157	1447117-015	COIL 68UH
P102	157825	1474632-004	CONNECTOR 1 PIN
P1BCD	154481	2860742-007	CONNECTOR 8 PIN
P1LED	147605	1467740-081	CONNECTOR 9 PIN
P1MPS	154364	2860742-004	CONNECTOR 5 PIN
P2BCD	151328	2870575-001	CONNECTOR 1 PIN
P2LED	147606	1467740-091	CONNECTOR 10 PIN
Q2501	146301	1417309-004	TRANSISTOR VOLUME MUTE
Q2502	145410	1417330-015	TRANSISTOR VIDEO BLANKER
Q2503	153399	1417306-015	TRANSISTOR SYNC DETECT
Q2504	151974	1417303-005	TRANSISTOR MEMORY POWER DOWN
Q2505	142190	1417330-001	TRANSISTOR MEMORY POWER DOWN
Q2506	145410	1417330-015	TRANSISTOR MEMORY POWER DOWN
Q2507	153325	1417347-002	TRANSISTOR MID BAND SWITCH
Q2508	142190	1417330-001	TRANSISTOR MID BAND SWITCH
Q2510	145410	1417330-015	TRANSISTOR SYNC DEFEAT
R2501	145042	1447144-020	RES WW 2W 5% 6.6R
R2502	141244	1420347-141	RES WW 3W 5% 470R
R2512	829320	993218-728	RES CF 1/4W 2% 20K
R2513	829312	993218-723	RES CF 1/4W 2% 12K
R2538	829339	993218-735	RES CF 1/4W 2% 39K
R2539	829256	993218-715	RES CF 1/4W 2% 5.6K
R2540	829330	993218-732	RES CF 1/4W 2% 30K
R2551	831282	993115-247	* RES MFFP 1W 5% 8.2K
R2579	830047	993290-193	* RES CFFP 1/2W 5% 47R
R2581	831282	993115-247	RES MFFP 1W 5% 8.2K
R2586	831122	993115-209	RES MFFP 1W 5% 220R
R2589	829510	993218-469	RES CF 1/4W 5% 1M
R2591	829147	993218-389	RES CF 1/4W 5% 470R
U2501	157309	1421757-005	IC SYNTHESIZER
U2502	149870	1421716-002	IC BAND SWITCH
U2503	143766	1421719-001	IC DECODER
U2504	148446	2843187-001	IC MEMORY
Y2501	158618	2816766-001	CRYSTAL
110501	938321-006		CONTACT, P102
150698	2830548-002		COVER, BOTTOM
150697	2830548-001		COVER, TOP
139301	1479290-001		RETAINER, BEAD CHAIN
RADIO CHASSIS			
RC3042			
152549	2830557-001		CIRCUIT, RC3042 COMPLETE
C101	152554	248-703	CAPCD 13PF K 50V
C102	167697	248-702	CAPCD 12PF J 50V
C103	111838	248-646	CAPCD 6PF D 50V
C104	143879	249-504	CAPCD 1000PF M 50V
C105	168356	248-666	CAPCD 18PF J 50V
C106	169265	248-644	CAPCD 4PF D 50V
C107	169553	248-714	CAPCD 39PF K 50V
C108	165662	248-695	CAPCD 300PF J 50V
C109	143879	249-504	CAPCD 1000PF M 50V
C110	169252	248-645	CAPCD 5PF D 50V
C111	111838	248-646	CAPCD 6PF D 50V
C112	169271	246-430	CAPCD 10PF D 50V
C113	143879	249-504	CAPCD 1000PF M 50V
C114	143879	249-504	CAPCD 1000PF M 50V
C115	143879	249-504	CAPCD 1000PF M 50V

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
C116	152083	244-173	CAPCD .022UF Z 50V
C118	169552	248-631	CAPCD 1PF C 50V
C120	169551	248-632	CAPCD 2PF C 50V
C123	169552	248-631	CAPCD 1PF C 50V
C124	169268	248-724	CAPCD 100PF K 50V
C127	169551	248-632	CAPCD 2PF C 50V
C128	168550	248-690	CAPCD 180PF J 50V
C129	152606	249-722	CAPCD 390PF J 50V
C130	152606	249-722	CAPCD 390PF J 50V
C131	169261	252-613	CAP LYTC 3.3UF 25V
C132	167827	244-171	CAPCD .01UF M 50V
C133	167827	244-171	CAPCD .01UF M 50V
C134	123800	274-115	CAP POLY 4700PF PF M 500V
C136	169265	241-868	CAPCD 4PF D 50V
C138	169261	252-613	CAP LYTC 3.3UF 25V
C139	143873	248-726	CAPCD 120PF K 500V
C140	123801	274-116	CAP POLY 6800PF M 50V
C141	167827	244-171	CAPCD .01UF M 50V
C142	169261	252-613	CAP LYTC 3.3UF 25V
C143	169261	252-613	CAP LYTC 3.3UF 25V
C145	169278	275-113	CAP OLY .022UF M 50V
C146	127477	252-332	CAP LYTC 220UF 10V
C147	143879	249-504	CAPCD 1000PF M 50V
C148	169268	248-724	CAPCD 100PF K 50V
C149	169552	248-631	CAPCD 1PF C 50V
C201	169261	252-613	CAP LYTC 3.3UF 25V
C202	169278	275-113	CAP POLY .022UF M 50V
C203	146464	252-621	CAP LYTC 10UF 25V
C204	168517	252-331	CAP LYTC 100UF 10V
C205	167827	244-571	CAPCD .01UF K 50V
C206	152552	252-631	CAP LYTC 100UF 26V
C207	168725	253-131	CAP LYTC 100UF 160V
C208	152270	249-758	CAPCD 4700PF P 50V
CR101	147213	5330-131	DIODE
CR102	172856	5330-661	DIODE
CR103	147213	5330-131	DIODE
CR104	152551	5331-052	DIODE
CR105	152551	5331-052	DIODE
CR106	152550	5331-502	DIODE
CR107	152550	5331-502	DIODE
CR201	123296	573-516	THERMISTOR
CR202	166726	5330-102	DIODE
CR203	152548	5380-101	DIODE
FR201	167707	170-403	RES FUSE
IC101	152547	5357-581	IC
IC102	152546	5357-591	IC
L101	165105	5126-061	COIL
L102	169560	5126-006	COIL
L103	167035	324-003	COIL
L104	165664	5126-007	COIL
L105	166722	5152-015	COIL
L106	168709	5120-275	COIL
Q101	125994	573-507	TRANSISTOR
Q102	170388	573-510	TRANSISTOR
Q201	152544	5321-293	TRANSISTOR
Q202	152545	5322-691	TRANSISTOR
R208	832282	171-249	RES MF 2W 5% 8200R
RC101	152553	186-365	CIRCUIT ENCAPSULATED
RC102	152553	186-365	CIRCUIT ENCAPSULATED
RC103	152553	186-365	CIRCUIT ENCAPSULATED
S1	152537	5624-331	SWITCH
S2	153968	5601-223	SWITCH
T101	168717	5140-017	TRANSFORMER
T102	168716	5140-018	TRANSFORMER
T103	168715	5140-021	TRANSFORMER
T104	168714	5140-019	TRANSFORMER
T105	168713	5148-033	TRANSFORMER
T106	152543	5148-034	TRANSFORMER
T107	152542	5130-153	TRANSFORMER
T108	168711	5136-016	TRANSFORMER
T109	168710	5130-033	TRANSFORMER
T201	152541	5250-104	TRANSFORMER
152539	5110502		ANTENNA, FERRITE
118750	146163513		CONNECTOR
147154	7230902		E-RING, 3MMD
152535	6395581		POINTER
152534	6345091		PULLEY
152113	721305		SCREW, 2.6MMD X 5MM
152538	7581841		SHAFT, TUNING
168321	6316231		SPRING
152540	5658071		SOCKET, LED
152537	5624331		SWITCH
152536	5601164		SWITCH

Continued on next page

Replacement Parts Continued (See Product Safety Note on first page of this parts list)

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
	123895	14428771104	TERMINAL, FEMALE
	118414	1442877204	TERMINAL, MALE
INSTRUMENT ASSEMBLY			
JJR967W,B			
C1	147918	2870697-210	* CAPCD 600PF M Z5U 1.4KV
C2	147918	2870697-210	* CAPCD 600PF M Z5U 1.4KV
C424	156249	2843149-502	CAP WIDTH ASSEMBLY
F101	154521	2813593-001	* FUSE 5A
J1	150722	2871835-002	* CONNECTOR
J110	118532	1461635-023	CONNECTOR
J2002	118532	1461635-023	CONNECTOR
J2006	112653	1440476-001	CONNECTOR
J2007	118532	1461635-023	CONNECTOR
J2008	152847	2860006-005	CONNECTOR
L101	154301	1496553-504	* COIL
L102	148491	1463890-507	* COIL DEGAUSSING
P1S2B	154363	2860742-002	CONNECTOR
P2MSC	158237	2861607-305	CONNECTOR
P2S2B	154363	2860742-002	CONNECTOR
P104	158677	2861681-008	CONNECTOR DEGAUSSING
P201	157826	2861603-303	CONNECTOR
P202	157354	2861604-303	CONNECTOR
P302	158237	2861607-305	CONNECTOR
P401	153788	2831216-001	* CONNECTOR QUAD YOKE
P501	158678	2861681-001	* CONNECTOR DUAL YOKE
P701	158238	2861607-306	CONNECTOR
R1	502539	82283-105	* RES CC 1/2W 5% 3.9M
R2	502539	82283-105	* RES CC 1/2W 5% 3.9M
R2002	145304	1472268-041	* RES CONTROL VOL LMTR TV
R2003	149908	1472268-042	* RES CONTROL VOL LMTR RADIO
R4201	155660	2843282-501	RES VOLUME CONTROL ASSEMBLY
R4202	147612	1473369-002	* RES CONTROL BRIGHTNESS
R4203	147613	1473369-004	* RES CONTROL COLOR
R4204	147613	1473369-004	* RES CONTROL TINT
R4207	149925	1473369-005	* RES CONTROL CONTRAST
S2B	153428	2843269-501	SWITCH CHANNEL
S3B	153837	2842234-504	SWITCH PROGRAM
S4201	150184	2842218-501	SWITCH ON/OFF

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
T2001	150346	1463873-506	* TRANSFORMER
V101		2814626-001	* PICTURE TUBE 19VLNP22
	155648	2830357-004	* BACK, CABINET
	155637	2843306-503	BLOCK, ANTENNA COUPLING
	153435	1467652-001	BRACKET, CHASSIS MTG
	150186	1468912-001	* BUTTON, ON/OFF
	155651	2840554-507	CABLE, AC POWER
	155663	1458795-502	CIRCUIT, ADAPTOR J1BCD/J1S2B
	152549	2830557-001	CIRCUIT, RC3042
	150471	1458752-502	CIRCUIT, AUX CONTROL
	143659	1491017-001	CLAMP, BEAM BENDER
	149902	1491071-002	CLAMP, YOKE
	111031	1491943-001	CLIP, FM ANTENNA
	128746	1445444-001	CONNECTOR
	149438	2841265-001	COVER, SETUP CONTROLS
	149903	2870908-001	CUSHION, WEDGE YOKE ADJ
	155664	2831343-001	DOOR, AUX CONTROL
	138785	1447321-006	GROMMET, FOR KINE SHIELD
	150190	1468938-001	HINGE, DOOR
	147685	1466408-002	INDICATOR, READOUT
		2817349-001	INSTRUCTIONS
	155661	1468951-002	* KNOB, MODE SWITCH
	150188	1468145-503	* KNOB, RADIO
	155662	2860764-001	* KNOB, VOLUME
	145381	1463762-502	MAGNET, BEAM BENDER
	155659	2830356-024	* MASK, CABINET FRONT JJR967W
	159864	2830356-031	* MASK, CABINET FRONT JJR967B
	114918	990327-128	NUT, CONTROL MTG
	124338	1403390-405	NUT, SPEAKER MTG
	155666	2860762-001	OVERLAY, DOOR
	155667	2860760-001	OVERLAY, SPEAKER
	151414	2841836-505	RES LIGHT DETECTING
	117360	1442576-006	RETAINER INDICATOR
	113348	990300-012	RETAINER, SPRING J TYPE
	149552	2871314-002	* SCREW, KINE MTG
	150474	2841923-501	* SHIELD, KINE HOOD
	156280	1468975-005	SPEAKER, 3 X 5 INCH 32 OHM
	155655	2871319-002	SPRING, DOOR LATCH
	157160	2870558-003	TERMINAL, ANTENNA
	123895	1442877-101	TERMINAL, FEMALE
	118414	1442877-201	TERMINAL, MALE J110,J2002,J2007
	153791	2870572-002	TERMINAL, P104,P501
	153789	2860025-001	TERMINAL, P401
	150200	2871816-001	WINDOW, RADIO
	155665	2860761-001	WINDOW, READOUT
	153294	2842008-503	* YOKE



FILE
1983
CTC 120 — S4

Color Television Supplement Service Data

CTC 120 Series

RCA Corporation Consumer Electronics

Technical Publications
P.O. Box 1976 | Indianapolis, Indiana 46206

RCA Inc. Technical Publications

5575 Royalmount Avenue | Town of Mount-Royal | Quebec, Canada H4P 1J8

Canada Stock Numbers:
Add prefix **64** to **Module** stock numbers.
Add prefix **70** to **Tuner** stock numbers.
Add prefix **62** to **all other** stock numbers.

SAFETY NOTICE

USE ISOLATION TRANSFORMER WHEN SERVICING

Components having special safety characteristics are identified by shading on schematics and by ★ stars on the parts list in this Service Data and its supplements and bulletins. Before servicing this chassis, it is important that the service technician read and follow the "Safety Precautions" and "Product Safety Notices" in the Basic Service Data.

★ For continued x-radiation protection, replace picture tube with original type or RCA-approved equivalent type. If field replacement of picture tube is required, an ADJUSTABLE TYPE BEAM BENDER must be ordered and installed on the neck of the replacement picture tube. Consult parts list for correct stock number.

Model-To-Major Assembly Cross Reference

MODEL	CHASSIS	TUNER CONTROL	TUNER VHF/UHF MULTIBAND	PICTURE TUBE	REMOTE
✓ GJR 652P	CTC 120A	MSC011A	MST007RA	★25VDGP22	
✓ GJR 653PR	CTC 120A	MSC012RA	MST007RA	★25VGDP22	MCR017AREV1/CRK33H

This is a **Supplement Service Data**. It covers model-related information and any exceptions to the Basic Service Data 1983 CTC 120

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CTC 120 Series

See Basic Service Data for additional disassembly instructions.

Auxiliary Control Assembly Removal

Remove one 1/4" hex head screw. Pull assembly straight back and out of instrument (remove P701 from chassis).

Note: LDR leads are attached to PW 4200 board.

Frequency Synthesis Tuner and Control Assembly Removal

Remove interconnect plug and cable assemblies.
 P2MSC from J2MSC (on MSC module).
 P1BCD (manual version) from Channel Switch Assembly.
 P2BCD (remote version) from Channel Switch Assembly.
 P1MCR (remote version) from MCR module.
 P1MPS (remote version) from keyboard assembly.
 P1SVS (remote version) from keyboard assembly.
 P1LED from LED Channel Display Assembly.
 P2LED from LED Channel Display Assembly.
 P3MSC From MSC assembly
 I-F Cable Assembly from J24001 (on MST Tuner Module).
 P1101 From MCR016A
 Remove VHF antenna (leads or cable) from antenna block.
 Remove UHF antenna leads from UHF terminals.

Remove one (1) 1/4" hex head screw at rear of tuning assembly and remove one (1) 1/4" hex head screw at front of assembly (below P2MSC connector). Pull assembly back slightly and lift out of instrument.

Keyboard Assembly Removal

Remove the manual keyboard (manual versions) and remote tuning switch keyboard (remote versions) by first removing four

(4) 1/4" screws. Disconnect PIBCD connector (manual version) or P1MPS connector and P2MCR (remote version). The assembly can then be removed from rear of the cabinet front.

LED Display Removal

Using needle nose pliers grasp spring mounting clip by leaf tab and pull spring clip off plastic mounting stud. Removal of one spring clip is sufficient. An alternate method is to use a thin pointed object and slip under the edge of the spring clip and pry loose from plastic mounting stud. Disconnect P1LED and P2LED connectors from LED Board.

Note: Care is required in removal of the spring clip so as to not break off plastic mounting stud.

On-Off Volume Assembly Removal (Manual Keyboard Versions)

Remove knob from front of set. Remove two (2) 1/4" hex head screws from assembly and remove assembly. Remove P101 and P202 from chassis.

MCR 017 Removal

Push spring clips (detented in notches on sides of MCR circuit board and withdraw board to the rear. Disconnect P106 (from J106 on chassis, P3MCR (from keyboard) and P1MCR (from MSC module).

LDR Assembly Removal

This assembly is held in place by one (1) 1/4" screw. The screw and assembly must be removed from the rear.

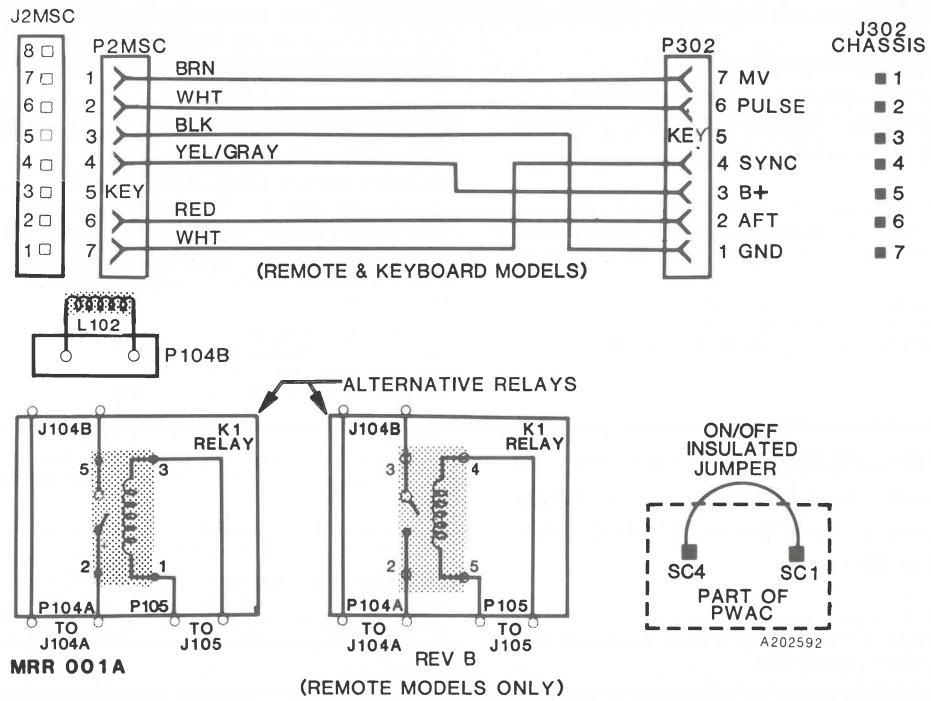


Fig. 1 — Interconnect Diagram

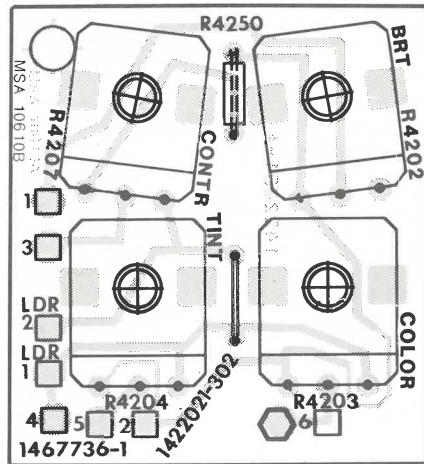


Fig. 2 — Auxiliary Control Circuit Board

REPLACEMENT PARTS

BEFORE REPLACING PARTS, READ THE FOLLOWING:

RCA-Approved Substitute Stock Numbers—Before ordering stock numbers in this parts list, look for an RCA-approved substitute stock number in the current *RCA Distributor & Special Products Price Schedule*. This will minimize your service time and avoid ordering parts you already have in stock.

See your RCA Distributor for Replacement Parts and Accessories.

Warranty Status of Assemblies and Parts—The warranty status of some assemblies and parts are indicated by one of the following Warranty Status Codes:

- Complete assembly not eligible for warranty exchange or replacement.
- † Eligible for warranty exchange for new or rebuilt unit.
- ‡ Complete assembly eligible for warranty replacement with new or rebuilt unit.

All parts listed without a Warranty Status Code symbol are eligible for warranty replacement as discrete components.

Warranty replacement of cabinet parts requires prior approval of RCA.

Warranty Status and Specifications of assemblies and parts are subject to change without notice.

PRODUCT SAFETY NOTE—Components marked with a (★) have special characteristics important to safety. Before replacing any of these components, read carefully the **PRODUCT SAFETY NOTICE** in the Basic Service Data. Do not degrade the safety of the set through improper servicing. Although assemblies as a whole may not be marked with a (★), replacement of RCA assemblies with other assemblies not RCA approved may result in a safety hazard.

Canada Stock Numbers:

Add prefix **64** to **Module** stock numbers.

Add prefix **70** to **Tuner** stock numbers.

Add prefix **62** to **all other** stock numbers.

.....AVOID REPLACEMENT PART ERRORS.....

File supplements and addendums immediately upon receipt, and consult the parts lists in them before ordering parts.

NOTE: For complete coverage of all parts and assemblies used in instruments equipped with the chassis series to which this service data relates, consult the following publications:

● **Basic Service Data**—Chassis and tuning systems and most related parts and assemblies that do not differ from one model or model group to another.

● **Service Data Supplements**—Cabinet, auxiliary, and other parts and assemblies that differ from one model group to another.

● **Service Data Addendum**—Any parts additions, deletions, or other changes made after initial production.

Do not replace or order parts without first consulting any Addendum(s) that may have been issued since publication of this service data.

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
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TUNING SYSTEM ASSEMBLY**TUNER ASSEMBLY****MST007RA**

MST007RA SAME AS PREVIOUSLY ISSUED IN 1983 CTC120 EXCEPT AS LISTED.

MST 007RA	149798	2841828-501	MODULE COMPLETE
C24007	150724	2870613-214	★ CAPCD 1200PF M Z5U 1.4KV
C24008	150724	2870613-214	★ CAPCD 1200PF M Z5U 1.4KV
C24009	150724	2870613-214	★ CAPCD 1200PF M Z5U 1.4KV
R24002	157308	2812886-007	RES CC 1/2W 10% 3.9M
	150720	2841853-501	★ BLOCK, ANTENNA COMPLETE

INSTRUMENT ASSEMBLIES**GJR652P****GJR653PR**

C424	156249	2843149-502	CAP WIDTH ASSEMBLY
F101	154521	2813593-001	★ FUSE 5A
K1	147696	1458751-502	RELAY
L101	154301	1496553-504	★ COIL
L102	148493	1463890-509	★ COIL DEGAUSSING
P2MSC	158237	2861607-305	CONNECTOR
P101	157149	2861681-009	CONNECTOR
P104	158677	2861681-008	★ CONNECTOR DEGAUSSING
P201	157814	2861602-300	CONNECTOR
P202	157354	2861604-303	CONNECTOR
P302	158237	2861607-305	CONNECTOR
P401	153788	2831216-001	★ CONNECTOR QUAD YOKE
P501	158678	2861681-001	★ CONNECTOR DUAL YOKE
P701	158238	2861607-306	CONNECTOR
R118	147872	945313-160	RES REMOTE POWER

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
---------------	--------------	----------------	-------------

R4201	143924	1472207-104	* RES CONTROL VOL
R4202	147612	1473369-002	* RES CONTROL BRIGHTNESS
R4203	147613	1473369-004	* RES CONTROL COLOR
R4204	147613	1473369-004	* RES CONTROL TINT
R4207	149925	1473369-005	* RES CONTROL CONTRAST
S4201	143924	1472207-104	* SWITCH ON/OFF (MODEL GJR652P)
V101		2814627-001	* PICTURE TUBE 25VGD22
159880	2831304-051	* BACK, COVER	
	2817966-001	BOOK, INSTRUCTION GJR652P	
	2817304-002	BOOK, INSTRUCTION GJR653PR	
154300	2840554-506	* CABLE, AC POWER	
156270	1439369-007	CAP, KINE COVER	
128573	1446199-001	CASTER	
150471	1458752-502	CIRCUIT, AUX CONTROL	
143659	1491017-001	CLAMP, BEAM BENDER/YOKE	
158671	2844180-001	CLIP, INDICATOR MTG	
147821	2870635-001	CLIP, REMOTE RECEIVER MTG	
157893	1467638-023	DOOR, AUX CONTROL	
153781	1467748-005	FRAME, CHASSIS MTG	
143459	1496207-001	GROMMET, MST MTG	
138785	1447321-006	GROMMET, FOR KINE SHIELD	
147685	1466408-002	INDICATOR, READ OUT	
153782	2860711-001	INSULATOR, SERVICE CONTROLS	
143735	1495121-514	* KNOB, ON/VOL (MODEL GJR652P)	
145381	1463762-502	MAGNET, BEAM BENDER	
159881	1438352-206	* MASK, BASIC GJR652P	
159882	1438352-202	* MASK, BASIC GJR653PR	
114918	990327-128	NUT, CONTROL MTG	
124338	1403390-405	NUT, SPEAKER MTG	
148028	2870627-001	OVERLAY, CHAN/VOL GJR653PR	
157515	2840515-004	OVERLAY, LOGO GJR652P	
152503		PULL, DECORATIVE	
139301	1420183-004	RETAINER, BEAD CHAIN	
154435	1479290-011	RETAINER, WIRE TIE	
149552	2871314-001	* SCREW, KINE MTG	
151424	2841874-501	SHIELD, KINE HOOD	
148073	1467914-001	SOCKET, CASTER	
142947	1468977-005	SPEAKER, 4 X 6 INCH 32 OHM	
141648	1449759-003	STOP, DOOR	
151425	2842237-504	SWITCH, CHAN/VOL GJR653PR	
152794	2842238-503	SWITCH, KEYBOARD GJR652P	
153837	2842234-504	SWITCH, PROGRAM GJR653PR	
153791	2870572-002	TERMINAL, P101,P104,P501	
153789	2860025-001	TERMINAL, P401	
147985	2870602-001	WINDOW, READOUT GJR652P	
157500	1468918-007	WINDOW, READOUT GJR653PR	
153243	1463773-506	* YOKE	



FILE
1983
CTC 120 — S4 (I)
RCASCO

Color Television Supplement Service Data

CTC 120 Series

RCA Corporation Consumer Electronics

Technical Publications
P.O. Box 1976 | Indianapolis, Indiana 46206

RCA Inc. Technical Publications

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Canada Stock Numbers:
Add prefix **64** to **Module** stock numbers.
Add prefix **70** to **Tuner** stock numbers.
Add prefix **62** to **all other** stock numbers.

SAFETY NOTICE USE ISOLATION TRANSFORMER WHEN SERVICING

Components having special safety characteristics are identified by shading on schematics and by ★ stars on the parts list in this Service Data and its supplements and bulletins. Before servicing this chassis, it is important that the service technician read and follow the "Safety Precautions" and "Product Safety Notices" in this Service Data.

★ For continued x-radiation protection, replace picture tube with original type or RCA-approved equivalent type. If field replacement of picture tube is required, an ADJUSTABLE TYPE BEAM BENDER must be ordered and installed on the neck of the replacement picture tube. Consult parts list for correct stock number.

Model-To-Major Assembly Cross Reference

MODEL	CHASSIS	TUNER CONTROL	TUNER VHF/UHF	PICTURE TUBE	VIDEO/AUDIO IN
JJR 980W	CTC 120A	MSC 011B	MST 013RB	★19VLNP22	PW5200
JJR 990P	CTC 120A	MSC 011A	MST 007RA	★25VGDP22	

NOTE: MST 013 SAME AS MST 007 EXCEPT ANTENNA BLOCK ASSEMBLY. MSC 011B SAME AS MSC 011RA EXCEPT AS SHOWN IN THIS SUPPLEMENT.

General Information

Models JJR 980W, JJR 990P are designed primarily for Institutional Video Monitor use. They employ tamper-proof screws for the cabinet back.

This receiver is also equipped with a cover plate for the service controls to discourage unauthorized service adjustments.

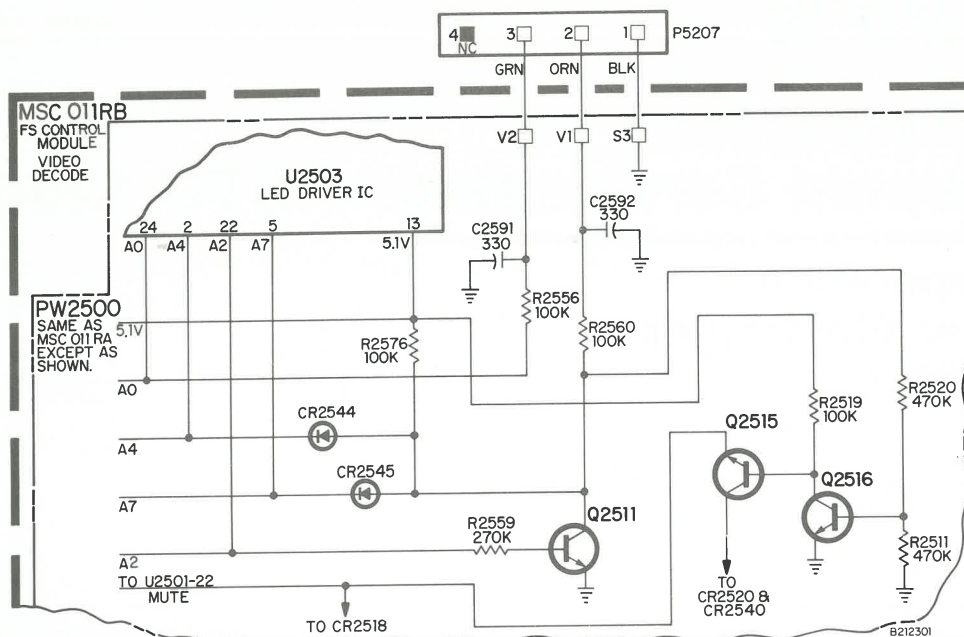
Video Monitor

To have access to Video/Audio Input/Output functions, depress Button 91 on front panel.

This is a Supplement Service Data. It covers model-related information and any exceptions to the Basic Service Data 1983 CTC 120

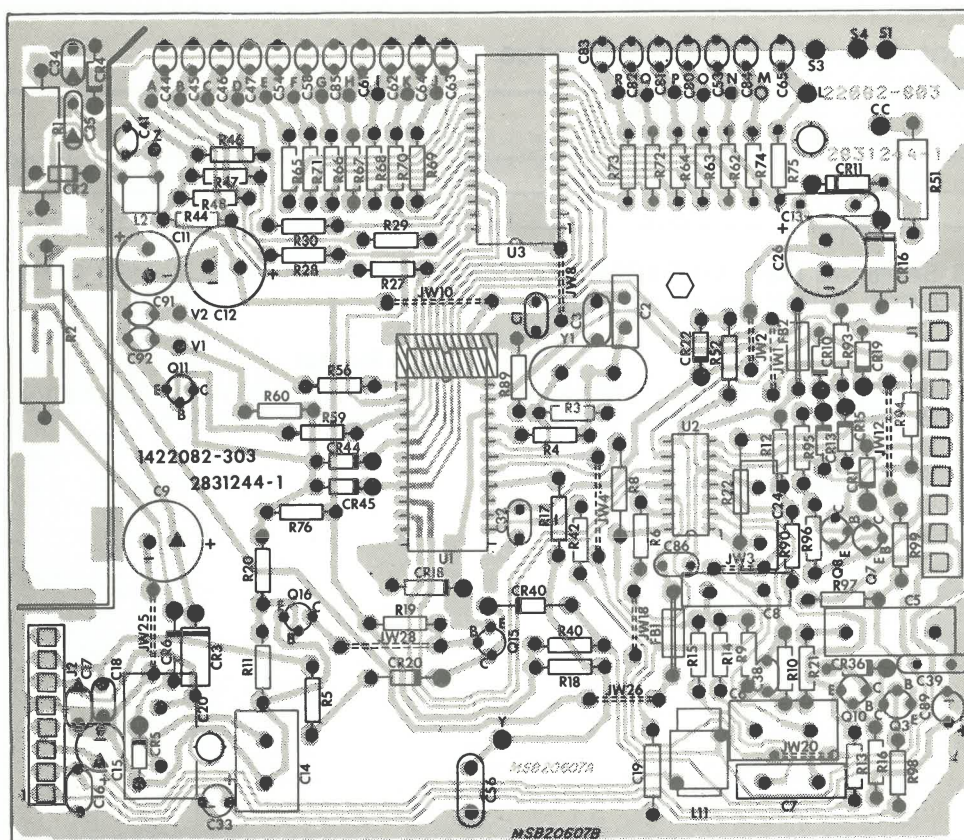
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CTC 120 Series



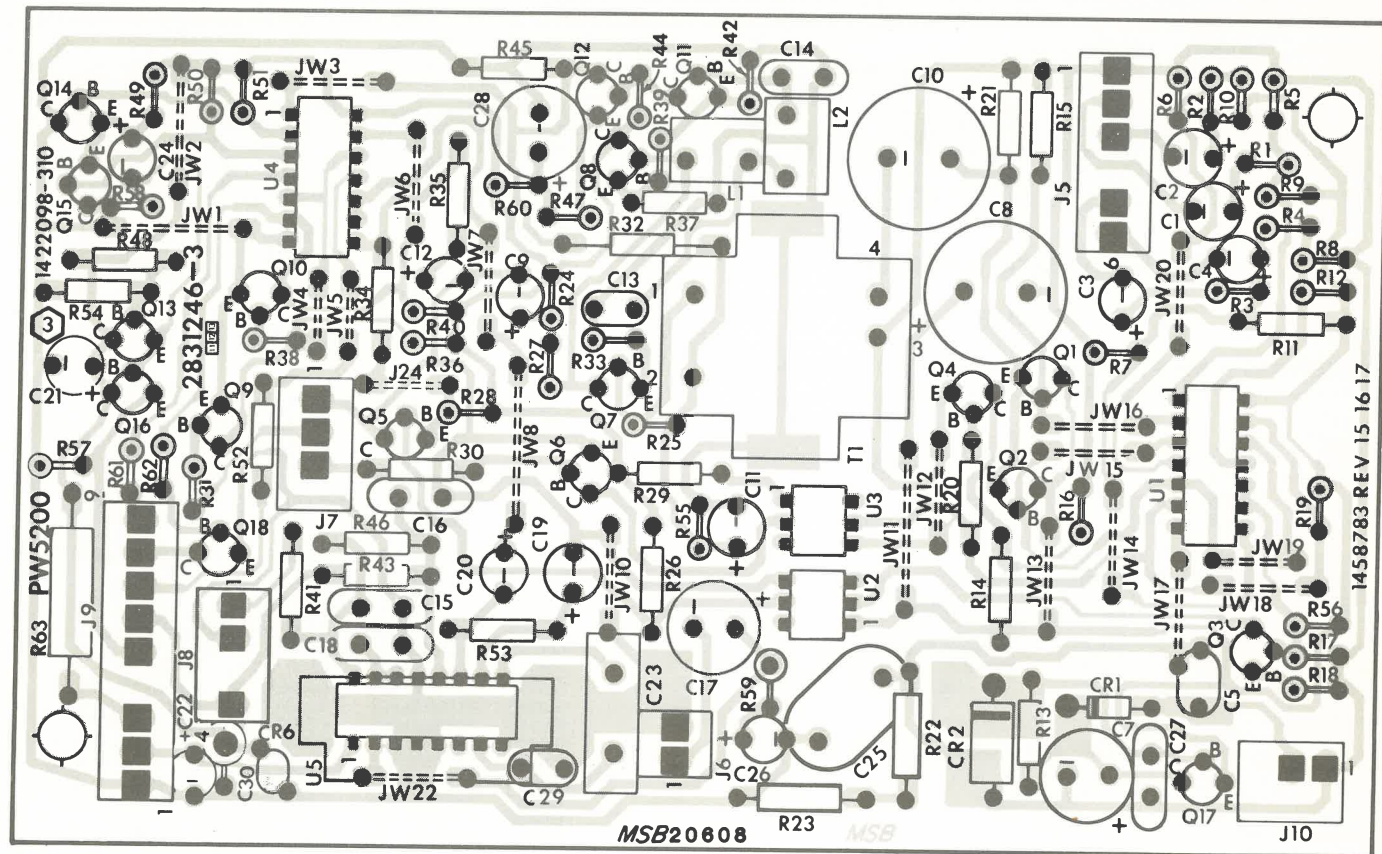
NOTE: MSC 011RB SAME AS MSC 011RA EXCEPT AS SHOWN

Fig. 1 — MSC 011RB Partial Schematic Diagram



NOTE: ADD 2500 SERIES PREFIX TO ITEM NUMBERS

Fig. 2 — MSC 011RB Tuner Control Module Circuit Board



NOTE: Add 5200 Series Prefix to Item Numbers

Fig. 3 — Video/Audio IN Circuit Board

AUXILIARY INPUT OPERATION (VIDEO-AUDIO-IN)

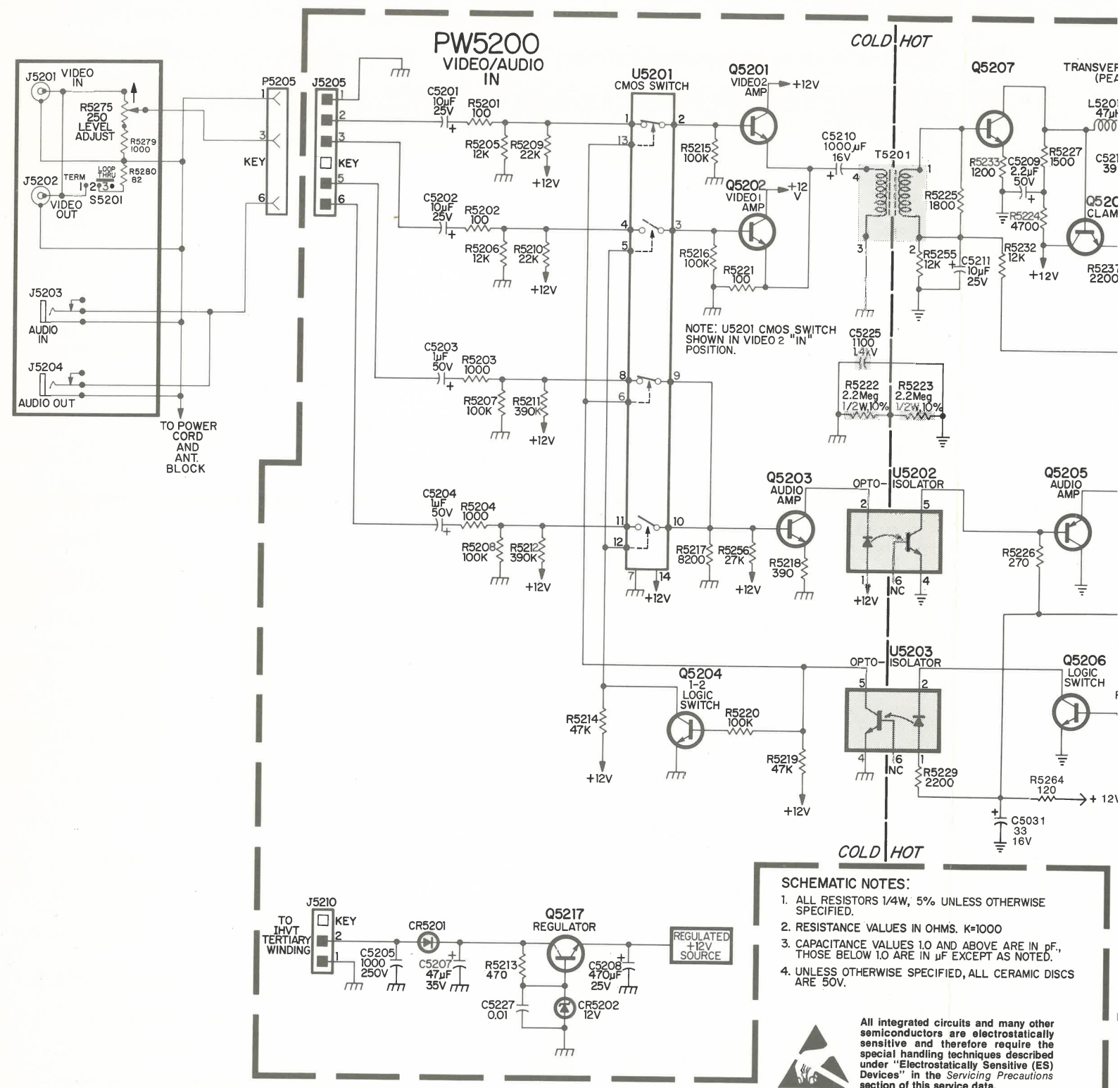
The levels of video at inputs J5201 and J5202 can be adjusted by R5275 and R5276 respectively, to reduce the input video signal to 1 volt p-p. The video signal enters the PW5200 board through P5205 and CMOS switch U5201, and is processed by transistors Q5201/Q5202 through Q5216 and associated circuits.

Q5211 introduces peaking to the input video signal so that either of the composite video signals (similar to a TV I-F demodulated signal) is presented through P&J 5209 pin 5 to the main chassis at stake M4.

Audio at input J5203 and J5204 is coupled through CMOS switch U5201 to Q5203 and Q5205. It then is coupled through CMOS switch U5204 to audio processor (U5205) and through J5206 to the speakers and associated components.

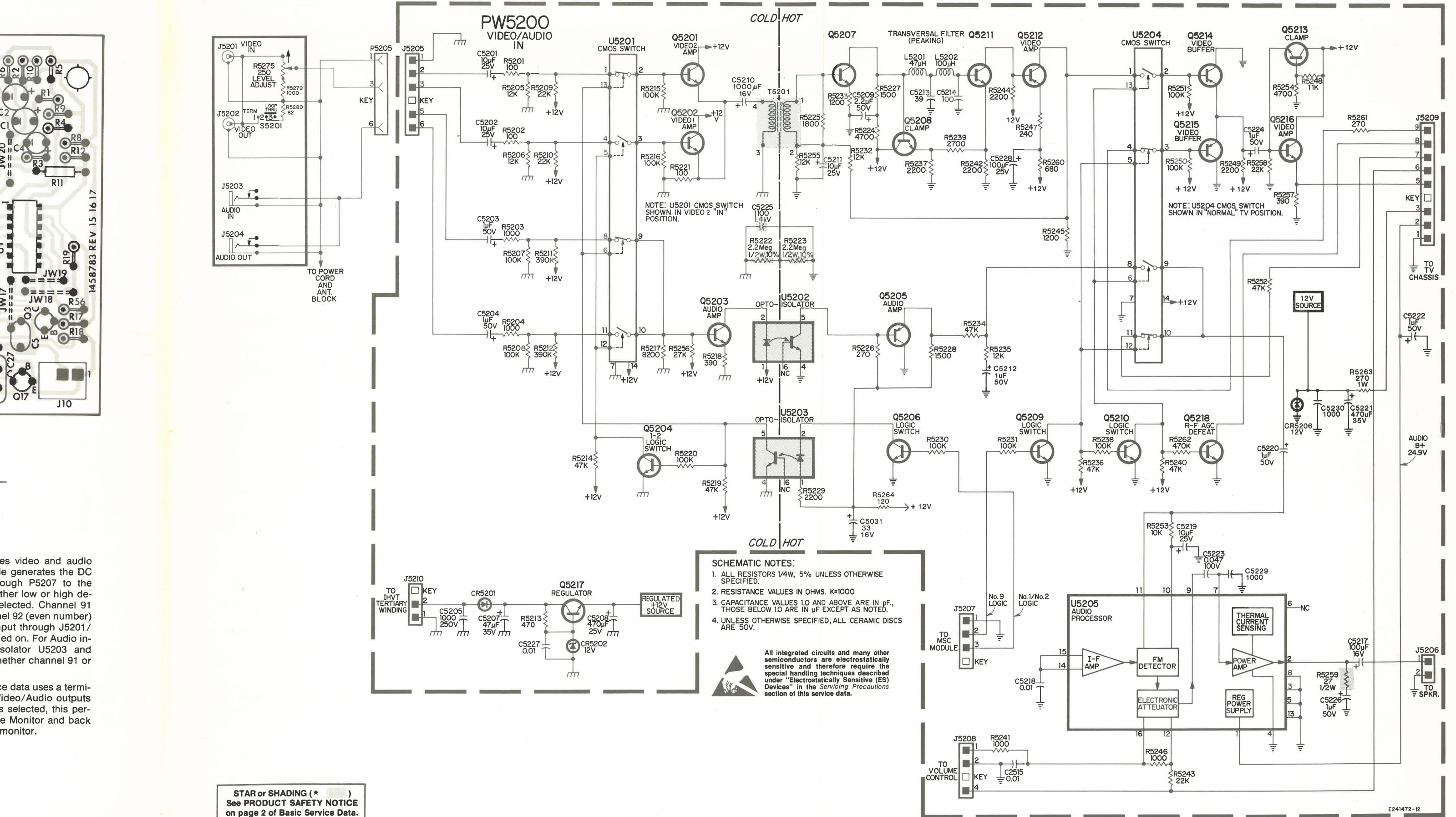
Selecting either channel 91 or 92 initiates video and audio monitor operation. The MSC Control module generates the DC Voltage Logic inputs that are applied through P5207 to the PW5200 Circuit Board. The Logic level is either low or high depending on whether channel 91 or 92 is selected. Channel 91 (odd number) creates high logic and Channel 92 (even number) creates Low Logic (zero volts). For video input through J5201/J5202, Q5210 is turned off and Q5209 is turned on. For Audio input through J5203/J5204, Q5206, Opto-Isolator U5203 and Q5204 are turned on or off depending on whether channel 91 or 92 is selected.

Note: Model JJR 980W covered in this service data uses a termination switch and J5202/J5204 are Video/Audio outputs instead of inputs. When channel 91 is selected, this permits the feeding of Video/Audio to the Monitor and back out to video recorder or to a another monitor.



STAR or SHADING (*)
See PRODUCT SAFETY NOTICE
on page 2 of Basic Service Data.

Fig. 4 — Video/Audio In Circuit Board Schematic



es video and audio
le generates the DC
ough P5207 to the
ither low or high de-
ected. Channel 91
el 92 (even number)
put through J5201/
ed on. For Audio in-
solator U5203 and
ether channel 91 or

ce data uses a termi-
ideo/Audio outputs
s selected, this per-
e Monitor and back
monitor.

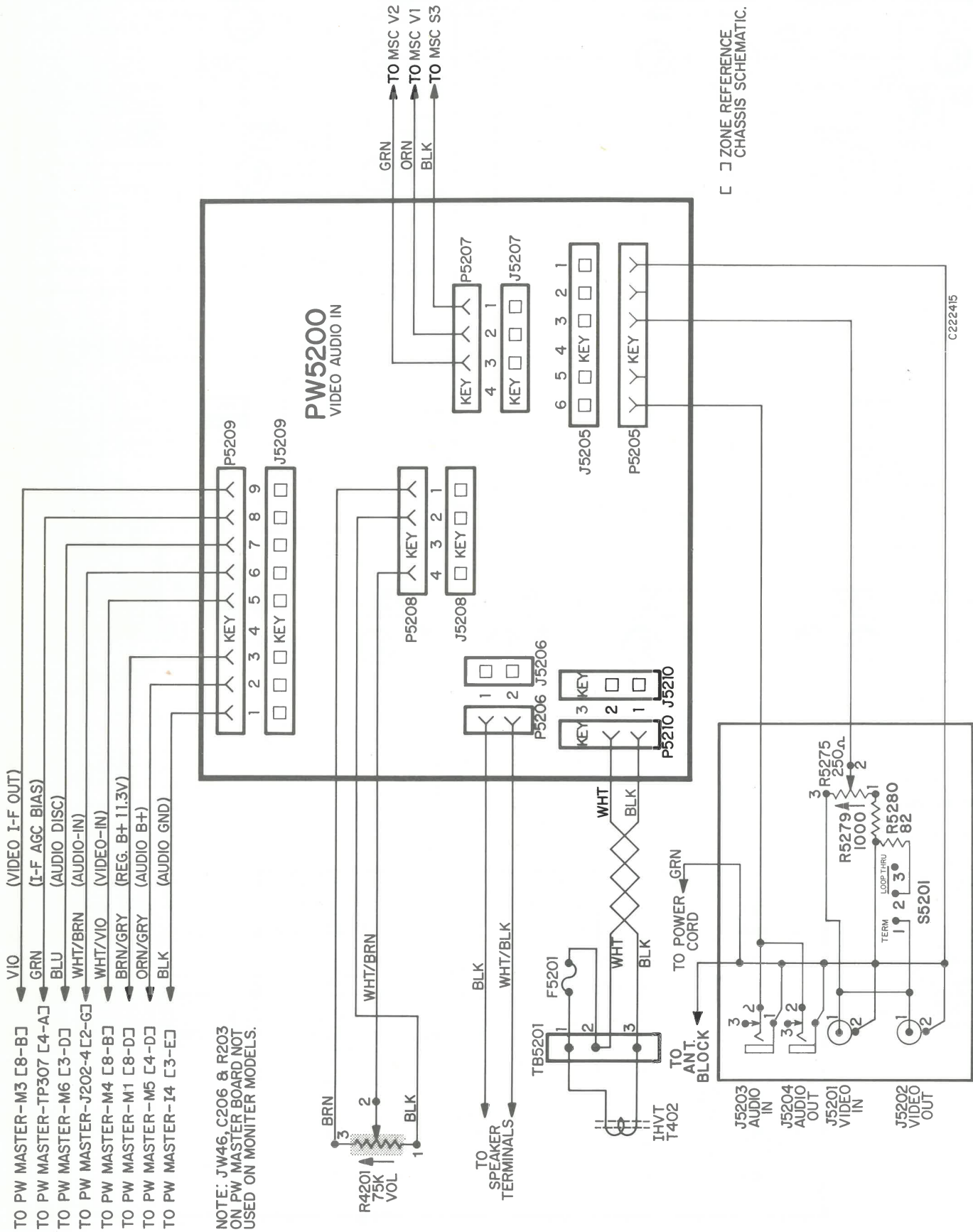


Fig. 5 — JJR 980 Interconnect Wiring

REPLACEMENT PARTS

BEFORE REPLACING PARTS, READ THE FOLLOWING:

RCA-Approved Substitute Stock Numbers—Before ordering stock numbers in this parts list, look for an RCA-approved substitute stock number in the current *RCA Distributor & Special Products Price Schedule*. This will minimize your service time and avoid ordering parts you already have in stock.

See your RCA Distributor for Replacement Parts and Accessories.

Warranty Status of Assemblies and Parts—The warranty status of some assemblies and parts are indicated by one of the following Warranty Status Codes:

- Complete assembly not eligible for warranty exchange or replacement.
- † Eligible for warranty exchange for new or rebuilt unit.
- ‡ Complete assembly eligible for warranty replacement with new or rebuilt unit.

All parts listed without a Warranty Status Code symbol are eligible for warranty replacement as discrete components.

Warranty replacement of cabinet parts requires prior approval of RCA.

Warranty Status and Specifications of assemblies and parts are subject to change without notice.

PRODUCT SAFETY NOTE—Components marked with a (★) have special characteristics important to safety. Before replacing any of these components, read carefully the **PRODUCT SAFETY NOTICE** in the Basic Service Data. Do not degrade the safety of the set through improper servicing. Although assemblies as a whole may not be marked with a (★), replacement of RCA assemblies with other assemblies not RCA approved may result in a safety hazard.

Canada Stock Numbers:
Add prefix **64** to **Module** stock numbers.
Add prefix **70** to **Tuner** stock numbers.
Add prefix **62** to **all other** stock numbers.

..... AVOID REPLACEMENT PART ERRORS
File supplements and addendums immediately upon receipt, and consult the parts lists in them before ordering parts.

NOTE: For complete coverage of all parts and assemblies used in instruments equipped with the chassis series to which this service data relates, consult the following publications:

- **Basic Service Data**—Chassis and tuning systems and most related parts and assemblies that do not differ from one model or model group to another.
- **Service Data Supplements**—Cabinet, auxiliary, and other parts and assemblies that differ from one model group to another.
- **Service Data Addendum**—Any parts additions, deletions, or other changes made after initial production.
Do not replace or order parts without first consulting any Addendum(s) that may have been issued since publication of this service data.

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
CHASSIS ASSEMBLY			
CTC120A			
CTC120A SAME AS PREVIOUSLY ISSUED IN 1983 CTC120 EXCEPT AS LISTED.			
T402	154848	2816796-400	★ IHVT W/EXT CORE WINDING
CIRCUIT BOARD			
VIDEO/AUDIO IN			
PW 5200	156260	1458783-501	CIRCUIT COMPLETE
C5201	145405	1490305-141	CAP LYTC 10UF R 25V
C5202	145405	1490305-141	CAP LYTC 10UF R 25V
C5203	141868	1490304-161	CAP LYTC 1UF R 50V
C5204	141868	1490304-161	CAP LYTC 1UF R 50V
C5205	143545	1490135-10N	CAPCD 1000PF Z Z5U 250V
C5207	142773	1490305-551	CAP LYTC 47UF R 35V
C5208	141432	1490306-541	CAP LYTC 470UF R 25V
C5209	146536	1490304-363	CAP LYTC 2.2UF M 50V
C5210	127098	1490307-131	CAP LYTC 1000UF R 16V
C5211	145405	1490305-141	CAP LYTC 10UF R 25V
C5212	141868	1490304-161	CAP LYTC 1UF R 50V
C5213	134936	1491406-13A	CAPCD 39PF J NPO 50V
C5214	143871	1491406-63A	CAPCD 18F J NPO 50V
C5215	143882	1491409-31M	CAPCD .01UF M Z5P 50V
C5217	119358	1490306-131	CAP LYTC 100UF R 16V
C5218	143882	1491409-31M	CAPCD .01UF M Z5P 50V
C5219	145405	1490305-141	CAP LYTC 10UF R 25V
C5220	141868	1490304-161	CAP LYTC 1UF R 50V
C5221	142772	1490305-151	CAP LYTC 10UF R 35V
C5222	141868	1490304-161	CAP LYTC 1UF R 50V
C5223	132443	1472442-021	CAP POLY .047UF M 100V
C5224	141868	1490304-163	CAP LYTC 1UF M 50V
C5225	154327	2870697-213	★ CAPCD 1100PF M Z5U 1400V
C5226	141868	1490304-161	CAP LYTC 1UF R 50V
C5227	143882	1491409-31M	CAPCD .01UF M Z5P 50V
C5228	146259	1490306-143	CAP LYTC 100UF M 25V
C5229	143879	1491407-92M	CAPCD 1000PF K Z5P 50V
C5230	148057	2841253-92M	CAPCD 1000PF K Z5P 50V
CR5201	159649	1476171-043	DIODE
CR5202	141873	99202-218	DIODE ZENER 12V
CR5206	141873	99202-218	DIODE ZENER 12V
L5201	139482	1478734-001	COIL 47UH
L5202	159648	1478734-009	COIL 100UH
Q5201	143793	1417306-011	TRANSISTOR VIDEO AMP

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
Q5202	143793	1417306-011	TRANSISTOR VIDEO AMP
Q5203	142711	1417306-008	TRANSISTOR AUDIO AMP
Q5204	142711	1417306-008	TRANSISTOR LOGIC SWITCH
Q5205	143802	1417330-010	TRANSISTOR AUDIO AMP
Q5206	142711	1417306-008	TRANSISTOR LOGIC SWITCH
Q5207	143793	1417306-011	TRANSISTOR
Q5208	143793	1417306-011	TRANSISTOR CLAMP
Q5209	142711	1417306-008	TRANSISTOR LOGIC SWITCH
Q5210	142711	1417306-008	TRANSISTOR LOGIC SWITCH
Q5211	143793	1417306-011	TRANSISTOR FILTER
Q5212	143802	1417330-010	TRANSISTOR VIDEO AMP
Q5213	143793	1417306-011	TRANSISTOR CLAMP
Q5214	143802	1417330-010	TRANSISTOR VIDEO BUFFER
Q5215	143802	1417330-010	TRANSISTOR VIDEO BUFFER
Q5216	143793	1417306-011	TRANSISTOR VIDEO AMP
Q5217	143793	1417306-011	TRANSISTOR REGULATOR
Q5218	146847	1417306-013	TRANSISTOR R-F AGC DEFEAT
R5222	154343	2813549-003	★ RES CC 1/2W 10% 2.2M
R5223	154343	2813549-003	★ RES CC 1/2W 10% 2.2M
R5259	830027	993210-359	★ RES CF 1/2W 5% 27R
T5201	154221	1497044-001	★ TRANSFORMER
U5201	154027	1421710-001	IC CMOS SWITCH
U5202	154224	2815480-004	★ IC OPTO ISOLATOR
U5203	145585	1421508-001	★ IC OPTO ISOLATOR
U5204	154027	1421710-001	IC CMOS SWITCH
U5205	142718	1465617-004	IC AUDIO PROCESSOR

TUNING SYSTEM ASSEMBLIES			
TUNER ASSEMBLY			
MST007RA			
MST007RA SAME AS MST007RF AS PREVIOUSLY ISSUED IN 1983 CTC120 EXCEPT AS LISTED.			
MST 007RA	149798	2841828-501	MODULE COMPLETE
	150720	2841853-501	BLOCK, ANTENNA COMPLETE
MST013RB			
MST013RB SAME AS MST007 PREVIOUSLY ISSUED IN 1983 CTC120 EXCEPT AS LISTED.			
MST 013RB	156335	2841828-504	MODULE COMPLETE

Replacement Parts

SYMBOL NO.	STOCK NO.
	157139
	157951
	157830
	157828
	157829
	157831
TUN	
MSC011B SAME	
MSC 011B	153285
C2591	146764
C2592	146764
CR2544	119597
CR2545	119597
P5207	159647
Q2511	146847
Q2515	146847
Q2516	146847

INS

C1	147918
C2	147918
C424	156249
F101	154521
F5201	154521
J1	150722
J5201	156256
J5202	156256
J5203	156257
J5204	156257
L101	154301
L102	148491
L102	148493
P2MSC	158237
P101	157149
P104	158677
P201	157814
P202	157354
P302	158237
P401	153788
P501	158678
P701	158238
P5206	157814
P5208	157354
P5209	148319
P5210	159638
R1	502527
R2	502527
R4201	149907

Continued on next page

REPLACEMENT PARTS

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Add prefix **70** to **Tuner** stock numbers.

Add prefix **62** to **all other** stock numbers.

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● **Service Data Supplements**—Cabinet, auxiliary, and other parts and assemblies that differ from one model group to another.

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SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
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CHASSIS ASSEMBLY

CTC120A

CTC120A SAME AS PREVIOUSLY ISSUED IN 1983 CTC120 EXCEPT AS LISTED.

T402	154848	2816796-400	★ IHVT W/EXT CORE WINDING
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CIRCUIT BOARD

VIDEO/AUDIO IN

PW 5200	156260	1458783-501	CIRCUIT COMPLETE
C5201	145405	1490305-141	CAP LYTC 10UF R 25V
C5202	145405	1490305-141	CAP LYTC 10UF R 25V
C5203	141868	1490304-161	CAP LYTC 1UF R 50V
C5204	141868	1490304-161	CAP LYTC 1UF R 50V
C5205	143545	1490135-10N	CAPCD 1000PF Z Z5U 250V
C5207	142773	1490305-551	CAP LYTC 47UF R 35V
C5208	141432	1490306-541	CAP LYTC 470UF R 25V
C5209	146536	1490304-363	CAP LYTC 2.2UF M 50V
C5210	127098	1490307-131	CAP LYTC 1000UF R 16V
C5211	145405	1490305-141	CAP LYTC 10UF R 25V
C5212	141868	1490304-161	CAP LYTC 1UF R 50V
C5213	134936	1491406-13A	CAPCD 39PF J NPO 50V
C5214	143871	1491406-63A	CAPCD 18F J NPO 50V
C5215	143882	1491409-31M	CAPCD .01UF M Z5P 50V
C5217	119358	1490306-131	CAP LYTC 100UF R 16V
C5218	143882	1491409-31M	CAPCD .01UF M Z5P 50V
C5219	145405	1490305-141	CAP LYTC 10UF R 25V
C5220	141868	1490304-161	CAP LYTC 1UF R 50V
C5221	142772	1490305-151	CAP LYTC 10UF R 35V
C5222	141868	1490304-161	CAP LYTC 1UF R 50V
C5223	132443	1472442-021	CAP POLY .047UF M 100V
C5224	141868	1490304-163	CAP LYTC 1UF M 50V
C5225	154327	2870697-213	★ CAPCD 1100PF M Z5U 1400V
C5226	141868	1490304-161	CAP LYTC 1UF R 50V
C5227	143882	1491409-31M	CAPCD .01UF M Z5P 50V
C5228	146259	1490306-143	CAP LYTC 100UF M 25V
C5229	143879	1491407-92M	CAPCD 1000PF K Z5P 50V
C5230	148057	2841253-92M	CAPCD 1000PF K Z5P 50V

CR5201	159649	1476171-043	DIODE
CR5202	141873	99202-218	DIODE ZENER 12V
CR5206	141873	99202-218	DIODE ZENER 12V

L5201	139482	1478734-001	COIL 47UH
L5202	159648	1478734-009	COIL 100UH

Q5201	143793	1417306-011	TRANSISTOR VIDEO AMP
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SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
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Q5202	143793	1417306-011	TRANSISTOR VIDEO AMP
Q5203	142711	1417306-008	TRANSISTOR AUDIO AMP
Q5204	142711	1417306-008	TRANSISTOR LOGIC SWITCH
Q5205	143802	1417330-010	TRANSISTOR AUDIO AMP
Q5206	142711	1417306-008	TRANSISTOR LOGIC SWITCH
Q5207	143793	1417306-011	TRANSISTOR
Q5208	143793	1417306-011	TRANSISTOR CLAMP
Q5209	142711	1417306-008	TRANSISTOR LOGIC SWITCH
Q5210	142711	1417306-008	TRANSISTOR LOGIC SWITCH
Q5211	143793	1417306-011	TRANSISTOR FILTER
Q5212	143802	1417330-010	TRANSISTOR VIDEO AMP
Q5213	143793	1417306-011	TRANSISTOR CLAMP
Q5214	143802	1417330-010	TRANSISTOR VIDEO BUFFER
Q5215	143802	1417330-010	TRANSISTOR VIDEO BUFFER
Q5216	143793	1417306-011	TRANSISTOR VIDEO AMP
Q5217	143793	1417306-011	TRANSISTOR REGULATOR
Q5218	146847	1417306-013	TRANSISTOR R-F AGC DEFEAT

R5222	154343	2813549-003	★ RES CC 1/2W 10% 2.2M
R5223	154343	2813549-003	★ RES CC 1/2W 10% 2.2M
R5259	830027	993210-359	★ RES CF 1/2W 5% 27R

T5201	154221	1497044-001	★ TRANSFORMER
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U5201	154027	1421710-001	IC CMOS SWITCH
U5202	154224	2815480-004	★ IC OPTO ISOLATOR
U5203	145585	1421508-001	★ IC OPTO ISOLATOR
U5204	154027	1421710-001	IC CMOS SWITCH
U5205	142718	1465617-004	IC AUDIO PROCESSOR

TUNING SYSTEM ASSEMBLIES

TUNER ASSEMBLY

MST007RA

MST007RA SAME AS MST007RF AS PREVIOUSLY ISSUED IN 1983 CTC120 EXCEPT AS LISTED.

MST 007RA	149798	2841828-501	MODULE COMPLETE
	150720	2841853-501	BLOCK, ANTENNA COMPLETE

MST013RB

MST013RB SAME AS MST007 PREVIOUSLY ISSUED IN 1983 CTC120 EXCEPT AS LISTED.

MST 013RB	156335	2841828-504	MODULE COMPLETE
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REPLACEMENT PARTS

Replacement Parts Continued (See Product Safety Note on first page of this parts list)

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
	157139	2841828-504	CABLE, COAXIAL
	157951	2830509-002	COVER, OUTER
	157830	2841830-004	SPRING, BOTTOM COVER
	157828	2841830-005	SRPING, BOTTOM COVER
	157829	2841829-002	SRPING, LARGE 'V'
	157831	2871399-002	SPRING, TOP COVER

TUNER CONTROL ASSEMBLY

MSC011B

MSC011B SAME AS MSC011A PREVIOUSLY ISSUED IN 1983 CTC120 EXCEPT AS LISTED.

MSC 011B	153285	2841954-502	MODULE COMPLETE
C2591	146764	1491407-30M	CAPCD 330PF Z Z5P 50V
C2592	146764	1491407-30M	CAPCD 330PF Z Z5P 50V
CR2544	119597	1471872-010	DIODE
CR2545	119597	1471872-010	DIODE
P5207	159647	2861604-304	CONNECTOR 4 PIN
Q2511	146847	1417306-013	TRANSISTOR SWITCH
Q2515	146847	1417306-013	TRANSISTOR MUTE DEFEAT
Q2516	146847	1417306-013	TRANSISTOR MUTE DEFEAT

INSTRUMENT ASSEMBLIES

JJR980W

JJR990P

C1	147918	2870697-210	★ CAPCD 600PF M Z5U 1.4KV
C2	147918	2870697-210	★ CAPCD 600PF M Z5U 1.4KV
C424	156249	2843149-502	CAP WIDTH ASSEMBLY
F101	154521	2813593-001	★ FUSE 5A
F5201	154521	2813593-001	★ FUSE 5A
J1	150722	2871835-002	★ CONNECTOR
J5201	156256	1510013-182	CONNECTOR
J5202	156256	1510013-182	CONNECTOR
J5203	156257	2871936-001	CONNECTOR
J5204	156257	2871936-001	CONNECTOR
L101	154301	1496553-504	★ COIL
L102	148491	1463890-507	★ COIL DEGAUSSING JJR980W
L102	148493	1463890-509	★ COIL DEGAUSSING JJR990P
P2MSC	158237	2861607-305	CONNECTOR
P101	157149	2861681-009	CONNECTOR
P104	158677	2861681-008	CONNECTOR
P201	157814	2861602-300	CONNECTOR
P202	157354	2861604-303	CONNECTOR
P302	158237	2861607-305	CONNECTOR
P401	153788	2831216-001	★ CONNECTOR QUAD YOKE
P501	158678	2861681-001	★ CONNECTOR DUAL YOKE
P701	158238	2861607-306	CONNECTOR
P5206	157814	2861602-300	CONNECTOR
P5208	157354	2861604-303	CONNECTOR
P5209	148319	1467768-208	CONNECTOR
P5210	159638	2861603-200	CONNECTOR
R1	502527	82283-101	★ RES CC 1/2W 10% 1.8M
R2	502527	82283-101	★ RES CC 1/2W 10% 1.8M
R4201	149907	1473326-036	★ RES CONTROL VOL JJR980W

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
R4201	143924	1472207-104	★ RES CONTROL VOL JJR990P
R4202	147612	1473369-002	★ RES CONTROL BRIGHTNESS
R4203	147613	1473369-004	★ RES CONTROL COLOR
R4204	147613	1473369-004	★ RES CONTROL TINT
R4207	149925	1473369-005	★ RES CONTROL CONTRAST
R5275	155635	1473370-001	RES CONTROL

S10B	152794	2842238-503	SWITCH KEYBOARD
S4201	150184	2842218-501	SWITCH ON/OFF JJR980W
S4201			PART OF R4201 JJR990P
S5201	159754	1467712-027	SWITCH

V101		2814626-001	★ PICTURE TUBE 19VLNP22
V101		2814627-001	★ PICTURE TUBE 25VGD22

155647	2830357-003	★ BACK, CABINET JJR980W
157490	2831304-028	★ BACK, COVER JJR990P
156432	2843306-507	BLOCK, ANTENNA COUPLING JJR980W
153435	1467652-001	BRACKET, CHASSIS MTG JJR980W
150186	1468912-001	★ BUTTON, ON/OFF JJR980W
155653	2840554-511	CABLE, AC POWER JJR980W

154300	280554-506	CABLE, AC POWER JJR990P
156270	1439369-007	CAP, KINE COVER
128573	1446199-001	CASTER
150471	1458752-502	CIRCUIT, AUX CONTROL
143659	1491017-001	CLAMP, BEAM BENDER
149902	1491071-002	CLAMP, YOKE
158671	2844180-001	CLIP, INDICATOR MTG
149438	2841265-001	COVER, SETUP CONTROLS
149903	2870908-001	CUSHION, WEDGE YOKE ADJ
150189	2830503-001	DOOR, AUX CONTROL JJR980W
157893	1467638-023	DOOR, AUX CONTROL JJR990P
153781	1467748-005	FRAME, CHASSIS MTG JJR990P
143459	1496207-001	GROMMET, MST MTG
138785	1447321-006	GROMMET, FOR KINE SHIELD
150190	1468938-001	HINGE, DOOR
147685	1466408-002	INDICATOR, READ OUT
	SP3148-001	INSTRUCTIONS JJR980W
	2817908-001	INSTRUCTIONS JJR990P
	2860711-001	INSULATOR, SERVICE CONTROLS
153782		INSULATOR, SERVICE CONTROLS
153895		KNOB, DECORATIVE JJR990P
143735	1495121-514	★ KNOB, ON/VOL JJR990P
150188	1468145-503	★ KNOB, VOL JJR980W
145381	1463762-502	MAGNET, BEAM BENDER
158286	1438352-079	★ MASK, BASIC JJR990P
155641	2830356-015	★ MASK, CABINET FRONT JJR980W
114918	990327-128	NUT, CONTROL MTG
124338	1403390-405	NUT, SPEAKER MTG
152520	2840515-002	OVERLAY, LOGO JJR990P
153896		PULL, DECORATIVE JJR990P
151414	2841836-505	RES LIGHT DETECTING
139301	1420183-004	RETAINER, BEAD CHAIN
117360	1442576-006	RETAINER, INDICATOR
113348	990300-012	RETAINER, SPRING J TYPE
154435	1479290-011	RETAINER, WIRE TIE
149552	2871314-002	★ SCREW, KINE MTG
150474	2841923-501	★ SHIELD, KINE HOOD JJR980W
151424	2841874-501	★ SHIELD, KINE HOOD JJR990P
148073	1467914-001	SOCKET, CASTER
156280	1468975-005	SPEAKER, 3 X 5 INCH 32 OHM JJR980W
		SPEAKER, 4 X 6 INCH 32 OHM JJR990P
142947	1468977-005	SPRING, DOOR LATCH
151670	2871319-001	STOP, DOOR
141648	1449759-003	TERMINAL, ANTENNA
157160	2870558-003	TERMINAL, P101,P104,P501
153791	2870572-002	TERMINAL, P401
153789	2860025-001	TERMINAL, P401
155656	2830531-002	WINDOW, READOUT JJR980W
147985	2870602-001	WINDOW, READOUT JJR990P
153294	2842008-503	★ YOKE JJR980W
153243	1463773-506	★ YOKE JJR990P

Continued on next page



Color Television Supplement Service Data

CTC 120 Series

RCA Corporation Consumer Electronics

Technical Publications
P.O. Box 1976 | Indianapolis, Indiana 46206

RCA Inc.

Technical Publications
5575 Royalmount Avenue | Town of Mount-Royal | Quebec, Canada H4P 1J8

Canada Stock Numbers:
Add prefix **64** to **Module** stock numbers.
Add prefix **70** to **Tuner** stock numbers.
Add prefix **62** to **all other** stock numbers.

SAFETY NOTICE

USE ISOLATION TRANSFORMER WHEN SERVICING

Components having special safety characteristics are identified by shading on schematics and by ★ stars on the parts list in this Service Data and its supplements and bulletins. Before servicing this chassis, it is important that the service technician read and follow the "Safety Precautions" and "Product Safety Notices" in the Basic Service Data.

★ For continued x-radiation protection, replace picture tube with original type or RCA-approved equivalent type. If field replacement of picture tube is required, an ADJUSTABLE TYPE BEAM BENDER must be ordered and installed on the neck of the replacement picture tube. Consult parts list for correct stock number.

Model-To-Major Assembly Cross Reference

MODEL	CHASSIS	TUNER CONTROL	TUNER VHF/UHF MULTIBAND	PICTURE TUBE
FJR 528P	CTC 120A	MSC011A	MST007RA	★25VGDP22

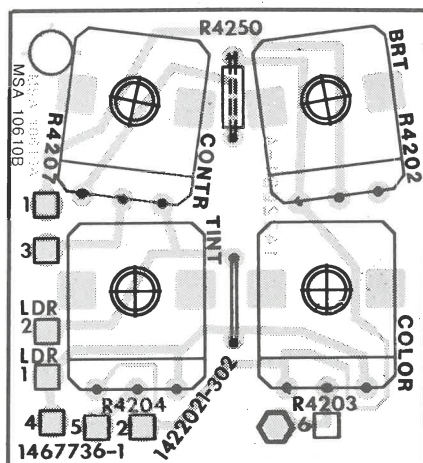


Fig. 1 — Auxiliary Control Circuit Board

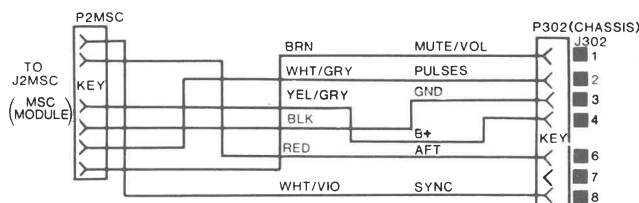


Fig. 2 — Interconnect Diagram

This is a Supplement Service Data. It covers model-related information and any exceptions to the Basic Service Data 1983 CTC 120

See Basic Service Data for additional disassembly instructions.

Auxiliary Control Assembly Removal

Remove one 1/4" hex head screw. Pull assembly straight back and out of instrument (remove P701 from chassis).

Frequency Synthesis Tuner and Control Assembly Removal

Remove interconnect plug and cable assemblies.

P2MSC from J2MSC (on MSC module).
P1BCD from Channel Switch Assembly.
P2BCD from Channel Switch Assembly.
P1MPS (remote version) from keyboard assembly.
P1LED from LED Channel Display Assembly.
P2LED from LED Channel Display Assembly.
I-F Cable Assembly from J24001 (on MST Tuner Module).
Remove VHF antenna (leads or cable) from antenna block.

Remove UHF antenna leads from UHF terminals.

Remove one (1) 1/4" hex head screw at rear of tuning assembly and remove one (1) 1/4" hex head screw at front of assembly (below P2MSC connector). Pull assembly back slightly and lift out of instrument.

LED Display Removal

Using needle nose pliers grasp spring mounting clip by leaf tab and pull spring clip off plastic mounting stud. Removal of one spring clip is sufficient. An alternate method is to use a thin pointed object and slip under the edge of the spring clip and pry loose from plastic mounting stud. Disconnect P1LED and P2LED connectors from LED Board.

Note: Care is required in removal of the spring clip so as to not break off plastic mounting stud.

Keyboard Assembly Removal

Remove the manual keyboard (manual versions) and remote tuning switch keyboard (remote versions) by first removing four (4) 1/4" screws. Disconnect P1BCD, P2BCD connectors. The assembly can then be removed from rear of the cabinet front.

REPLACEMENT PARTS

BEFORE REPLACING PARTS, READ THE FOLLOWING:

RCA-Approved Substitute Stock Numbers—Before ordering stock numbers in this parts list, look for an RCA-approved substitute stock number in the current *RCA Distributor & Special Products Price Schedule*. This will minimize your service time and avoid ordering parts you already have in stock.

See your RCA Distributor for Replacement Parts and Accessories.

Warranty Status of Assemblies and Parts—The warranty status of some assemblies and parts are indicated by one of the following Warranty Status Codes:

- Complete assembly not eligible for warranty exchange or replacement.
- † Eligible for warranty exchange for new or rebuilt unit.
- ‡ Complete assembly eligible for warranty replacement with new or rebuilt unit.

All parts listed without a Warranty Status Code symbol are eligible for warranty replacement as discrete components.

Warranty replacement of cabinet parts requires prior approval of RCA.

Warranty Status and Specifications of assemblies and parts are subject to change without notice.

PRODUCT SAFETY NOTE—Components marked with a (★) have special characteristics important to safety. Before replacing any of these components, read carefully the **PRODUCT SAFETY NOTICE** in the Basic Service Data. Do not degrade the safety of the set through improper servicing. Although assemblies as a whole may not be marked with a (★), replacement of RCA assemblies with other assemblies not RCA approved may result in a safety hazard.

Canada Stock Numbers:

Add prefix **64** to **Module** stock numbers.

Add prefix **70** to **Tuner** stock numbers.

Add prefix **62** to **all other** stock numbers.

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
INSTRUMENT ASSMSEMBLY			
FJR528P			
C424	156249	2843149-502	CAP WIDTH ASSEMBLY
F101	154521	2813593-001	★ FUSE 5A
L101	154301	1496553-504	★ COIL
L102	148493	1463890-509	★ COIL DEGAUSSING
P2MSC	158237	2861607-305	CONNECTOR
P101	157149	2861681-009	CONNECTOR
P104	158677	2861681-008	★ CONNECTOR DEGAUSSING
P201	157814	2861602-300	CONNECTOR
P202	157354	2861604-303	CONNECTOR
P302	158237	2861607-305	CONNECTOR
P401	153788	2831216-001	★ CONNECTOR QUAD YOKE
P501	158678	2861681-001	★ CONNECTOR DUAL YOKE
P701	158238	2861607-306	CONNECTOR
R4201	143924	1472207-104	★ RES CONTROL VOL
R4202	147612	1473369-002	★ RES CONTROL BRIGHTNESS
R4203	147613	1473369-004	★ RES CONTROL COLOR
R4204	147613	1473369-004	★ RES CONTROL TINT
R4207	149925	1473369-005	★ RES CONTROL CONTRAST
S4201	143924	1472207-104	★ SWITCH ON/OFF
V101		2814627-001	★ PICTURE TUBE 25VGP22

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
	159351	2831304-048	★ BACK, COVER
		2817966-001	BOOK, INSTRUCTION
	154300	2840554-506	CABLE, AC POWER
	156270	1439369-007	CAP, KINE COVER
	150471	1458752-502	CIRCUIT, AUX CONTROL
	158671	2844180-001	CLIP, INDICATOR MTG
	152519	1467638-010	DOOR, AUX CONTROL
	103480	1442221-001	FLANGE, LEG MTG
	138738	1472656-001	FOOT, CABINET
	160080	1467748-006	FRAME, CHASSIS MTG
	143459	1496207-001	GROMMET, MST/MSC MTG
	147685	1466408-002	INDICATOR, READ OUT
	153782	2860711-001	INSULATOR, SERVICE CONTROLS
	143735	1495121-514	★ KNOB, ON/VOL
	160079	1438352-204	★ MASK, BASIC
	114918	990327-128	NUT, CONTROL MTG
	124338	1403390-405	NUT, SPEAKER MTG
	157515	2840515-004	OVERLAY, LOGO
	139301	1420183-004	RETAINER, BEAD CHAIN
	154435	1479290-011	RETAINER, WIRE TIE
	149552	2871314-001	★ SCREW, KINE MTG
	151424	2841874-501	SHIELD, KINE HOOD
	142947	1468977-005	SPEAKER, 4 X 6 INCH 32 OHM
	141648	1449759-003	STOP, DOOR
	152794	2842238-503	SWITCH, KEYBOARD
	153791	2870572-002	TERMINAL, P101,P104,P501
	153789	2860025-001	TERMINAL, P401
	147985	2870602-001	WINDOW, READOUT
	153243	1463773-506	★ YOKE



FILE
1983
CTC 120 — S5 (I)
RCASCO

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Model-To-Major Assembly Cross Reference

MODEL	CHASSIS	TUNER CONTROL	TUNER VHF/UHF	PICTURE TUBE	REMOTE
JJR 988BR	CTC 120A	MSC013RA	MST007RA	★19VLNP22	MCR016RA/CRK28G
JJR 962WR	CTC 120A	MSC015RA	MST015RA	★19VLNP22	MCR018RA/WIRED

General Information

Model JJR988-R is designed primarily for Hotel/Motel use and Model JJR962-R is designed primarily for Hotel/Motel/Hospital use. Both models employ tamper-proof screws for the cabinet back. In addition, a cover plate is used to discourage unauthorized service adjustments of the rear panel controls and a security plate covers the auxiliary controls: Brightness, Color, Contrast, Tint, Program Select/Lock switch, Add and Erase buttons.

Door Lock

Note: To gain access to auxiliary controls, a knife blade or thin screwdriver must be inserted and moved from right to left at the top and bottom of the control door to release the latches holding the hinged door in place.

Model JJR962-R is equipped with a volume limiter control, R2002, internal-external speaker switch, S2001, and J2006 which provides for connection of a wired remote control system. These features are located on a bracket attached to the rear rail of the chassis.

The remote system features remote volume On/Channel Change/Off—all under the control of one "Function" button.

MSC015RA Frequency Synthesis Control Model is similar to MSC012RA. Servicing techniques are the same except for the addition of a connector cable (P1KLS) connecting the key lock switch assembly to provide for additional switching control for Model JGR962-R.

MST015RA is the same as MST007RA except for differences in the antenna isolation circuit. See Figure 5 and Replacement Parts.

Important Notice JJR962-R (Only)

To operate receiver, key lock located on the bottom, right, front of the cabinet must be in either the Rent, Information, or All channel position. The master on-off switch on the back of the cabinet must be on.

This is a Supplement Service Data. It covers model related information and any exceptions to the Basic Service Data 1983 CTC 120

A. Channel UP/DOWN and Power ON/OFF (Manual) Operation

1. To turn the television set on, depress the CHANNEL UP ON/OFF button.
 - a. By pushing this button, the set will advance through the programmed channel numbers. The set will automatically turn off on the transition between the highest and the lowest programmed channel. This is the normal method of turning the set off.
2. The channel down button can be used to select a lower programmed channel or to turn the set off.

B. Programming Channels**1. Key Lock Switch—JJR 962-R (Only)**

The key lock switch has four positions: Information, Rent, Off, and All Channel. Program desired channels in each position using the procedure in B.2.

a. Information

The information position allows programming of channels that are to be available with no rental charge, such as Information channels. One or more channels in the range 2 to 39 may be programmed.

If the receiver is on, the lowest channel previously programmed in the Information position will be automatically selected when the key is moved from the Rent to the Information position. The attendant will normally leave the key in the Information position if the receiver is not being rented.

b. Rent

The Rent position allows programming of channels that are to be available when the receiver is rented. Any channels in the range 2 to 39 may be programmed. If an Information channel is also desired in Rent Position, it must be programmed in Rent position. The attendant will turn the key to Rent when the receiver is rented.

b. Off

The Off position prevents the receiver from being operated. The attendant will turn the key to Off when the receiver is not rented, and no Information channel is available.

c. All

The All Channel position permits channels 2 to 83 to be programmed. All Channel is also used in special cases, where channels above 39 must be received.

Warning: Do not make program changes in the All Channel position if the Rent and Information positions are to be used.

NOTE: Channels 2 thru 39 programmed in the Information position will appear programmed between Channels 42 and 79 in the All Channel position. Channels programmed in All Channel position between 42 and 79 will appear as channels 2 thru 39 in the Information position.

2. Adding or Erasing Channels:

- a. Switch Channel Program Select/Lock switch to the "Select" position. (In this position no channel will be bypassed when channel selector is pressed.)
- b. Press the "Up" or "Down" Channel Selector Button until the desired channel is reached. When pressed, the channel will change once and then rapidly scan. Set volume control at mid-position. If the sound is off, the channel is deleted. If the sound is on, the channel is active.
- c. To add a channel, press the "Add" button. The sound will come on when channel is active.

d. To erase a channel, press the "Erase" button. The sound will go off.

e. Proceed to the next channel to be added or erased.

f. When programming is completed, return the Channel Program Select/Lock Switch to the "Lock" position. The channel "Up" and "Down" buttons will now switch the channels in numerical order and stop only at those channels programmed into the memory. Sound will be off during channels changes.

C. Operation of Receiver Electronic Volume, UP and DOWN Buttons

1. DO NOT USE the Volume UP or Volume DOWN buttons if the receiver is to be remote volume controlled via a pendant unit or an external volume potentiometer.
2. If receiver is to be used in a non-remote volume installation, control volume via the UP and DOWN volume buttons.
3. When power is first connected or after a powerline outage exceeding five (5) seconds:
 - a. JGR 962-R—The volume level will initiate to the volume limiter setting in the RENT, INFORMATION and OFF keylock positions, and will initiate to a normal listening level in the ALL keylock position.

D. Volume Limiter Control Without Remote (Located on TV Backcover)

1. Turn volume limiter fully counterclockwise and make sure speaker switch on rear of receiver is in the internal position.
2. Turn receiver on and push the Volume UP button for five (5) seconds.
3. Advance the volume limiter to the desired maximum loudness below the level where sound is distorted.

E. Volume Limiter Control-Remote Volume

1. If a remote control pendant or remote volume control is used, set the speaker switch on rear of receiver to the external position. Otherwise, set the speaker switch to internal position.
2. Turn volume limiter fully counterclockwise.
3. Turn receiver on and push the Volume UP button for five (5) seconds.
4. Advance pendant or other remote volume control to maximum volume.
5. Advance the volume limiter to the desired maximum loudness below the level where sound is distorted.
6. Volume should now be adjusted via remote control.
7. If the receiver volume DOWN button is used, the maximum available pendant volume will be equally reduced.

F. Operation of Remote Control Pendant

One button provides for on-off and channel change operation.

1. If receiver is off, depress TV button to turn receiver on.
2. Push TV button to advance channel to next higher programmed channel. Hold button to advance automatically twice a second.
3. Turn off will occur on change from highest programmed channel to lowest programmed channel.



All integrated circuits and many other semiconductors are electrostatically sensitive and therefore require the special handling techniques described under "Electrostatically Sensitive (ES) Devices" in the *Servicing Precautions* section of this service data.

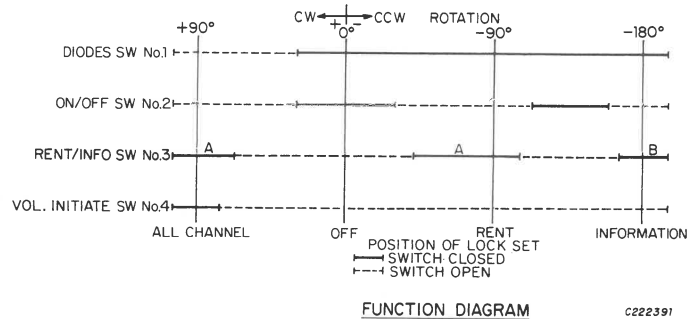
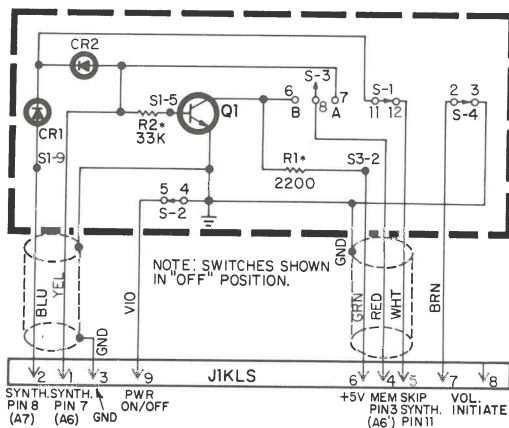
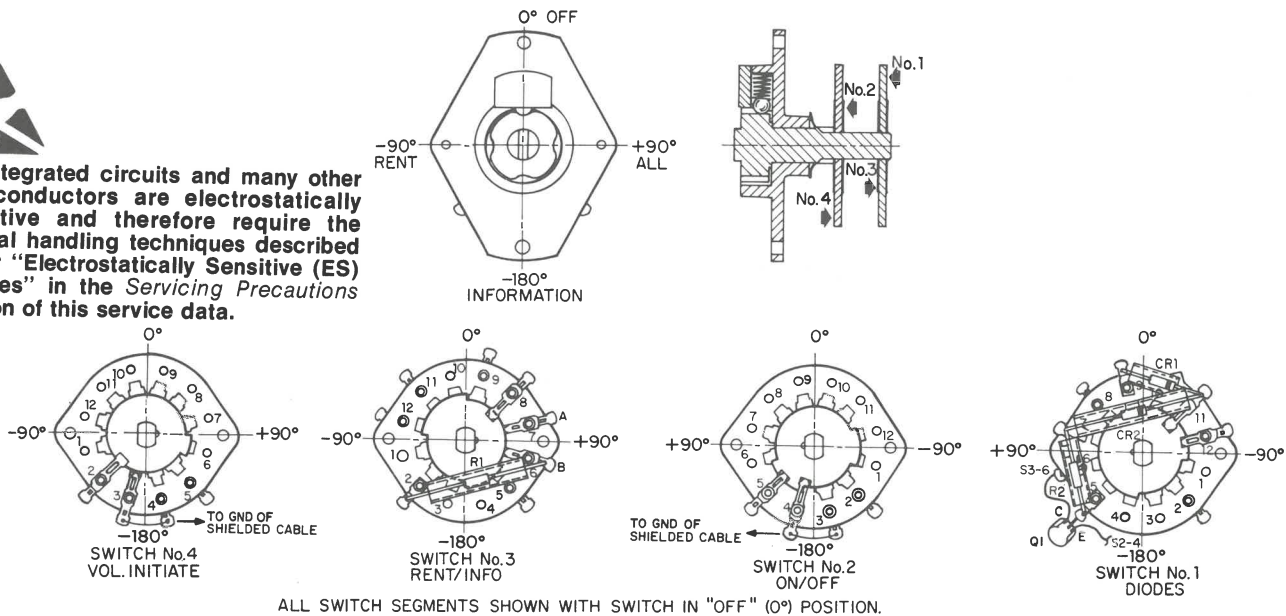


Fig. 1 — Key Lock Switch Assembly, Schematic and Sequence Diagram — JJR 962-R

DISASSEMBLY INSTRUCTIONS

Refer to Basic Service Data for additional disassembly instructions.

Cabinet Back Removal

Before removing the cabinet back, read "Safety Precautions" on page 2 of Basic Service Data.

1. Disconnect power cord from AC outlet.
2. Disconnect antenna leads from antenna block assembly.
3. Remove seven (7) 1/4" hex head screws: Two (2) from top edge of cabinet back, two (2) from rear auxiliary control bracket area, one (1) to right of Sharpness Control and two (2) at bottom edge of cabinet back.

Auxiliary Control Assembly Removal

Remove one (1) screw and pull assembly straight back and out of instrument (remove P107 from chassis). Note: LDR leads are attached to PW 4200 board.

LDR Assembly Removal

This assembly is held in place by one (1) 1/4" screw. The screw and assembly must be removed from the rear. Note: LDR leads are attached to PW 4200 circuit board.

Frequency Synthesis Tuner and Control Assembly Removal

Remove interconnect plug and cable assemblies.

P1KLS from J1KLS (Key lock switch).
 P3MSC from MSD module (JJR988).
 P1101 from MCR module (JJR988).
 P1104 from MCR module.
 P1MPS from keyboard assembly.
 P2BCD from keyboard assembly.
 P1LED from LED Channel Display Assembly.
 P2LED from LED Channel Display Assembly.
 I-F Cable Assembly from J24001 (on MST Tuner Module).

Remove VHF antenna (leads or cable) from antenna block.
Remove UHF antenna leads from UHF terminals.
Remove one (1) $\frac{1}{4}$ " hex head screw at rear of tuning assembly and remove one (1) $\frac{1}{4}$ " hex head screw at front of assembly (below P2MSC connector). Pull assembly back slightly and lift out of instrument.

LED Display Removal

Using needle nose pliers grasp spring mounting clip by leaf tab and pull spring clip off plastic mounting stud. Removal of one spring clip is sufficient. An alternate method is to use a thin pointed object and slip under the edge of the spring clip and pry loose from plastic mounting stud. Disconnect P1LED and P2LED connectors from LED Board.

Note: Care is required in removal of the spring clip so as to not break off plastic mounting stud.

Keyboard Assembly (S4B) Removal

Disconnect P1101 from J1101. Remove two $\frac{1}{4}$ " hex head screws; one from the top and one from the bottom. Withdraw assembly from cabinet.

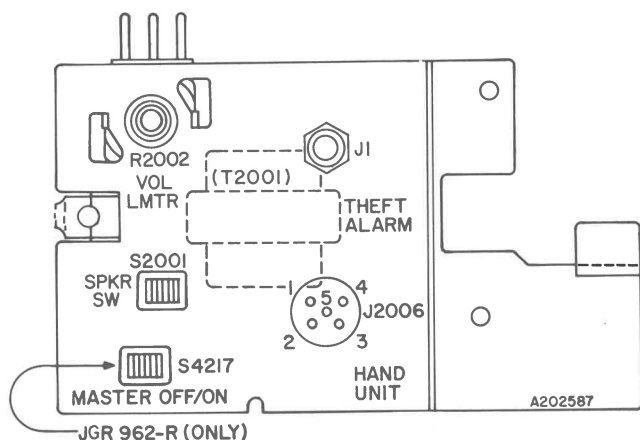


Fig. 2 — Remote Control Bracket

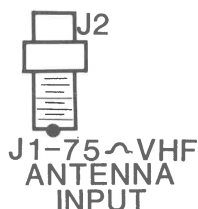


Fig. 4 — Antenna Connections

MCR Removal

Remove three $\frac{1}{4}$ " hex head screws; two from rear foot and one from front foot (closest to front of cabinet).

Disconnect cable/connector: J3MCR from P3MCR (jumper JCR960-R, to master On/Off switch JGR962-R)

P1MCR from J1MCR (chassis power) (MCR018, 016)

J2MCR from P2MCR (AC power)

P1101 from J1101 (S4B) keyboard (MCR018) (from MSC-MCR016)

P1102 from J1102 (audio output transformer - J2006 external hand unit MCR018) (From MCY004-MCR016).

P1103 from J1103 (speaker-audio MCR018) From S8B keyboard MCR016).

P1104 from J1104 (MSC)

The module can now be moved up and out the rear of the cabinet.

Key Lock & Switch Assembly Removal

Remove two $\frac{1}{4}$ " hex head screws holding wafer switch assembly to key lock assembly. Remove switch from rear. Remove $\frac{3}{4}$ " hex nut from key lock housing. Key lock can now be removed from front of cabinet.

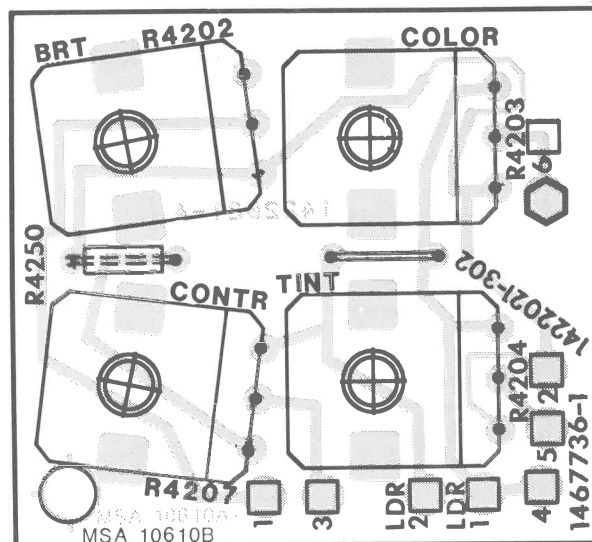
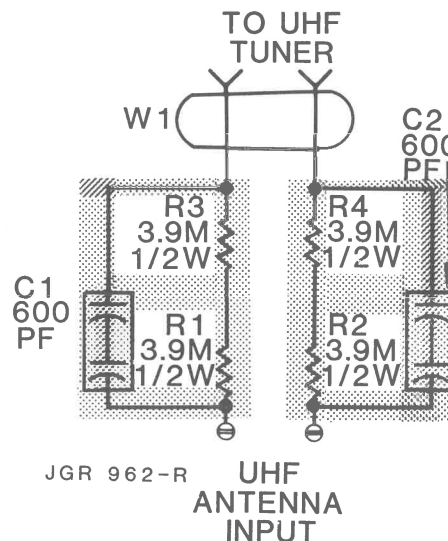


Fig. 3 — Auxiliary Control Circuit Board



STAR or SHADING (*)
See PRODUCT SAFETY NOTICE
on page 2 of Basic Service Data.

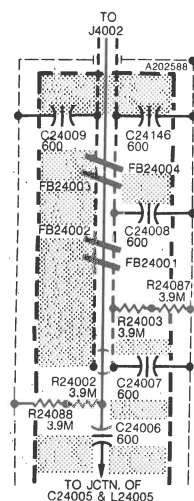
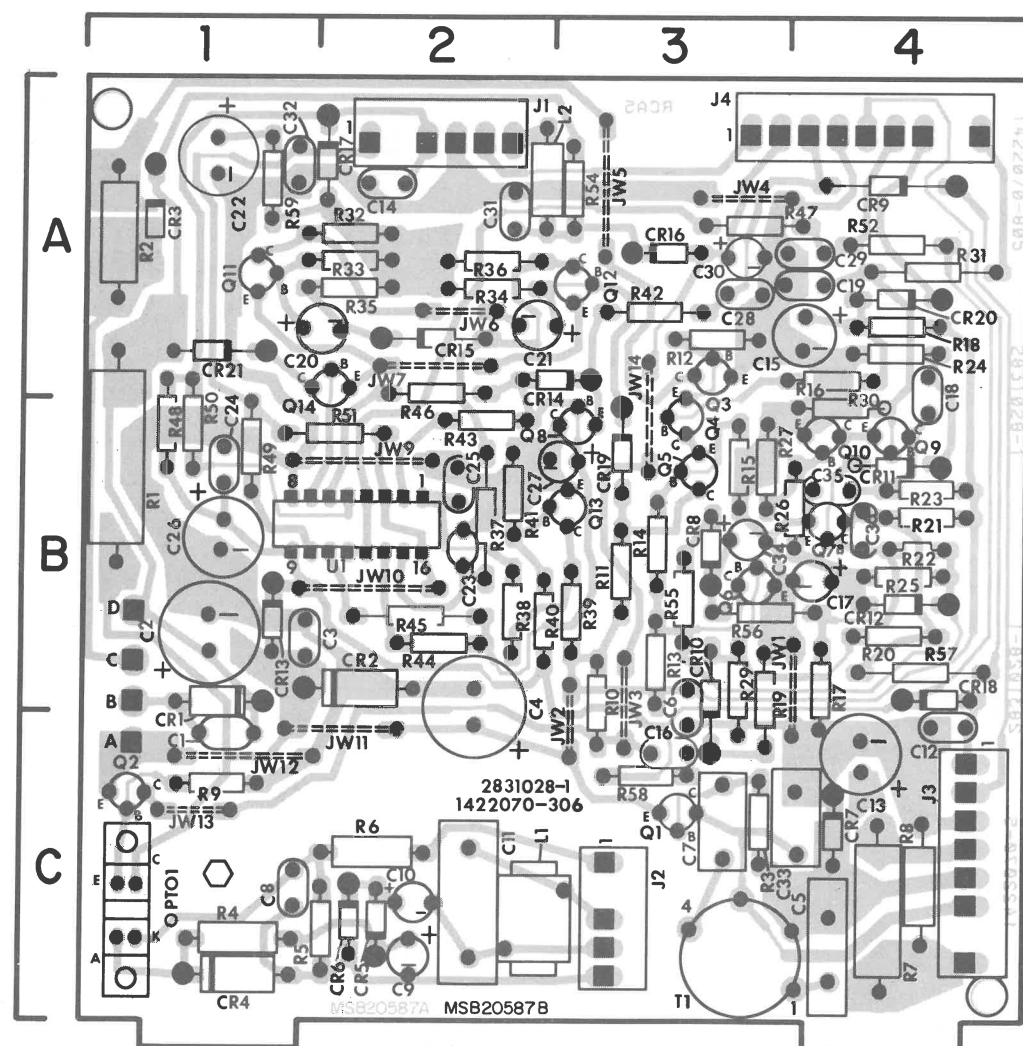


Fig. 5 - Antenna Isolation Circuit (Partial), MST015RA



ADD 1100 SERIES PREFIX TO COMPONENT NUMBERS
Fig. 6 - MCR018RA (PW 1100) Remote Receiver Circuit Board

STAR or SHADING (*)
See PRODUCT SAFETY NOTICE
on page 2 of Basic Service Data.

NOTES

1. ALL CAPACITORS ARE 50V. EXCEPT WHERE INDICATED.
2. ALL RESISTORS ARE 1/4W. 5% EXCEPT WHERE INDICATED.
3. CAPACITANCE VALUES ARE IN UFD. EXCEPT WHERE INDICATED.
4. RESISTANCE VALUES ARE IN OHMS K=X1000.
5. **INDICATES 2% TOLERANCE.
6. WITH P102/J102 CONNECTED, ATTACH OSCILLOSCOPE ACROSS J102 PINS 3 AND 5. ADJUST T101 FOR (22 KHz) NULL.



All integrated circuits and many other semiconductors are electrostatically sensitive and therefore require the special handling techniques described under "Electrostatically Sensitive (ES) Devices" in the Servicing Precautions section of this service data.

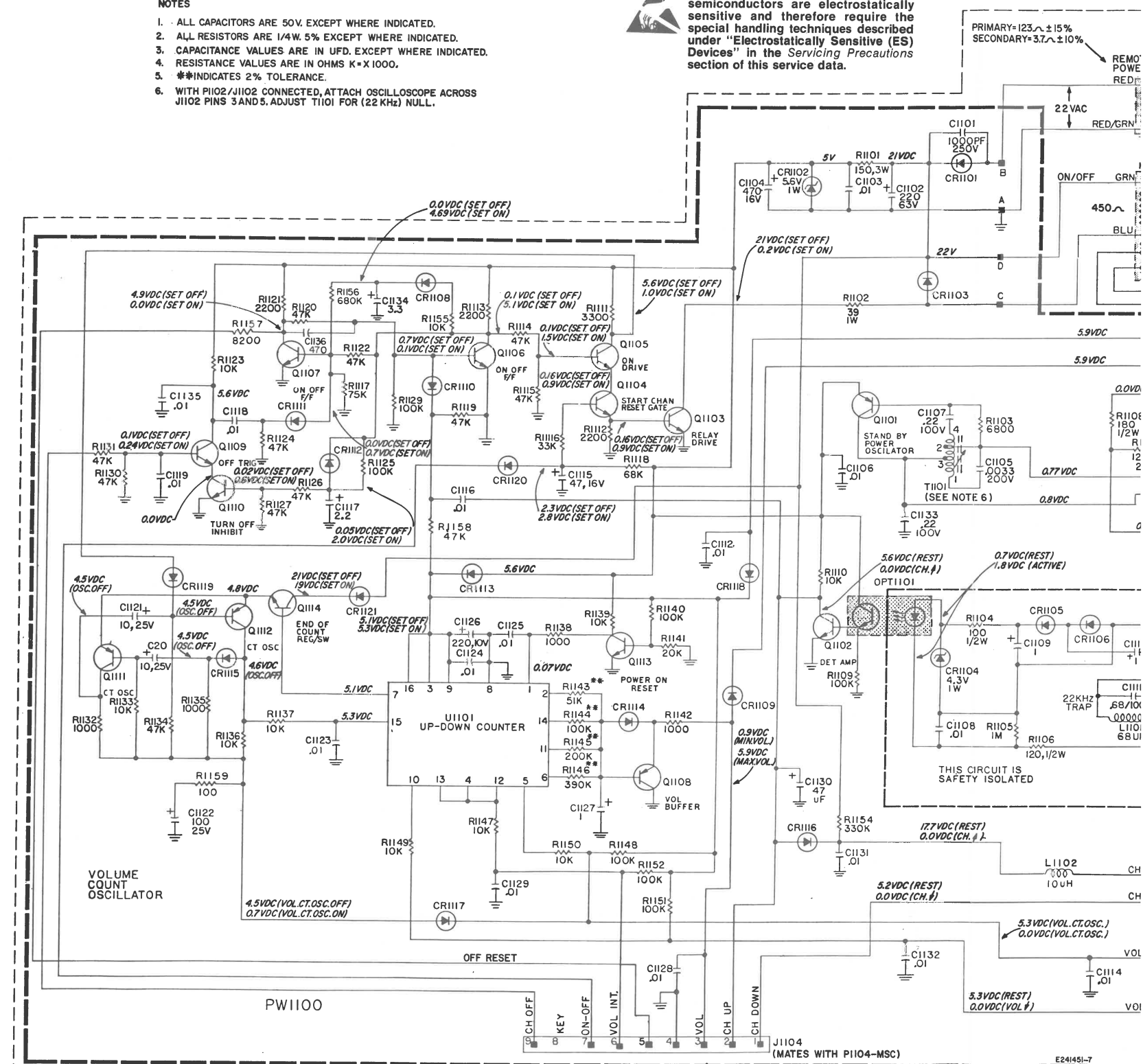


Fig. 7 - MCR018RA Remote Receiver and Chassis Inter

STAR or SHADING (★)
See PRODUCT SAFETY NOTICE
on page 2 of Basic Service Data.

NOTES

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2. ALL RESISTORS ARE 1/4W. 5% EXCEPT WHERE INDICATED.
3. CAPACITANCE VALUES ARE IN UFD. EXCEPT WHERE INDICATED.
4. RESISTANCE VALUES ARE IN OHMS $X = K \ 1000$,
5. **INDICATES 2% TOLERANCE.
6. WITH P102/J102 CONNECTED, ATTACH OSCILLOSCOPE ACROSS J102 PINS 3 AND 5. ADJUST T101 FOR (22 KHz) NULL.

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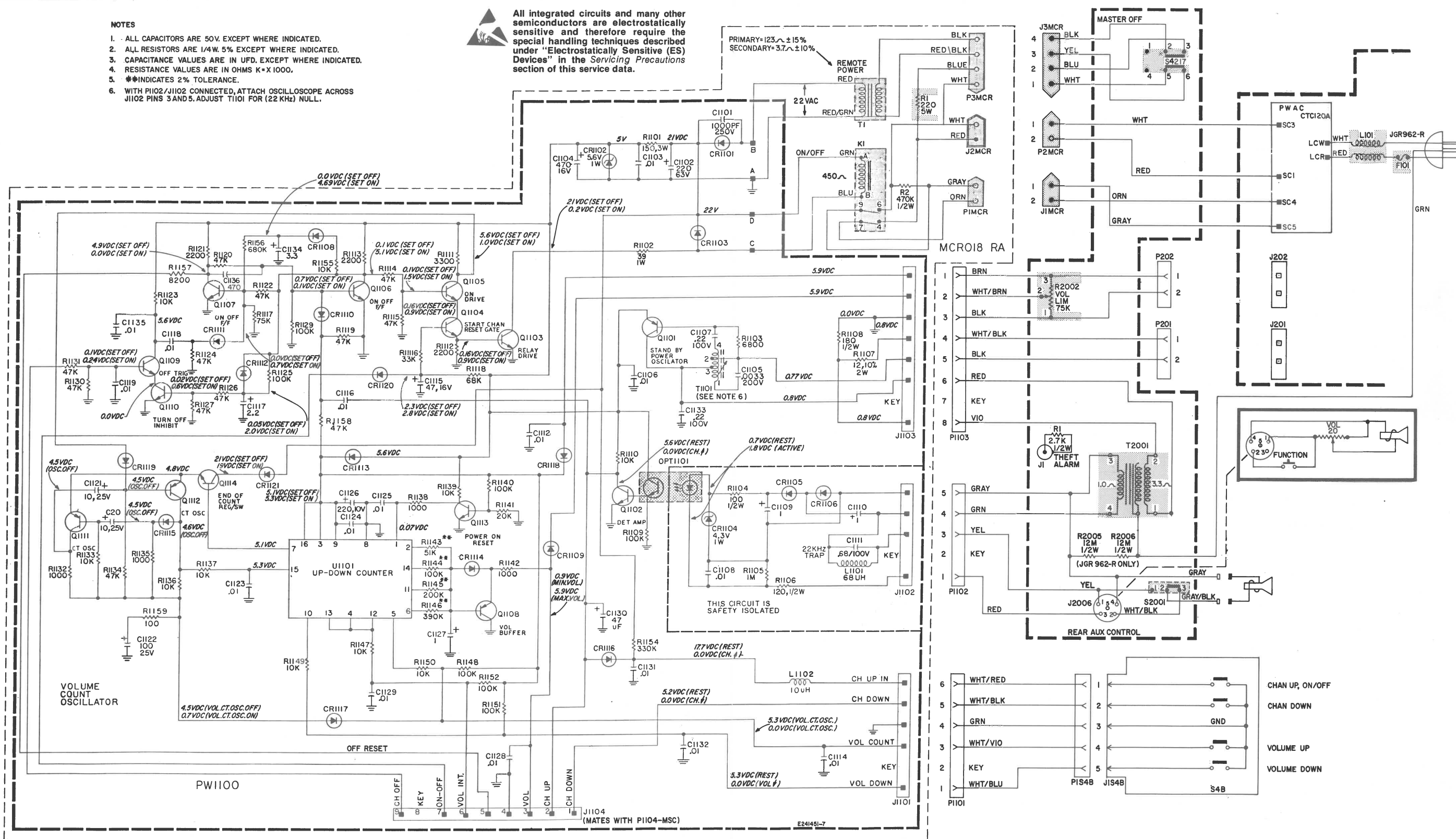
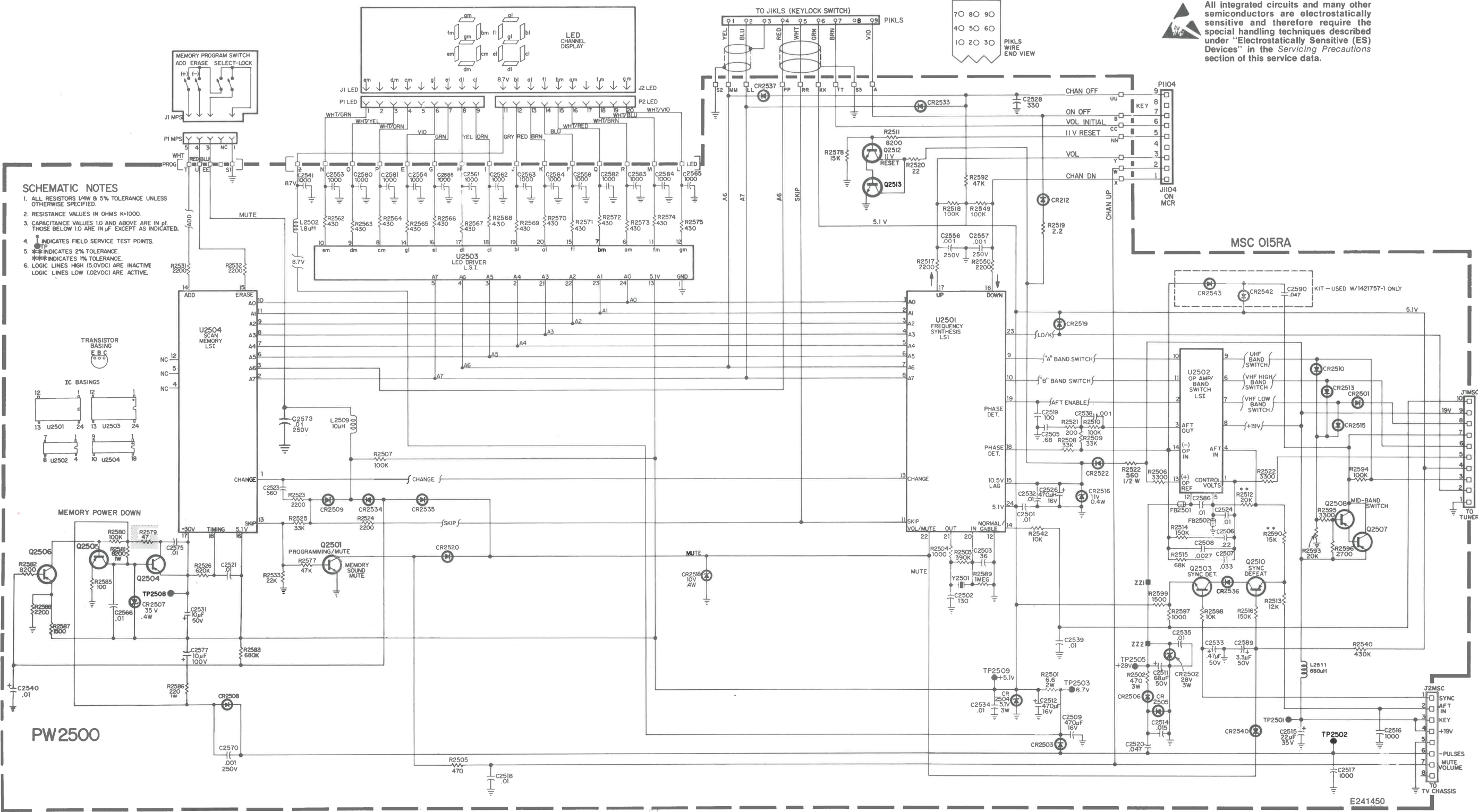


Fig. 7 — MCR018RA Remote Receiver and Chassis Interconnect Diagram

STAR or SHADING (*)
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- J2MSC
- 8 ☐
 - 7 ☐
 - 6 ☐
 - 5 ☐
 - 4 ☐
 - 3 ☐
 - 2 ☐
 - 1 ☐

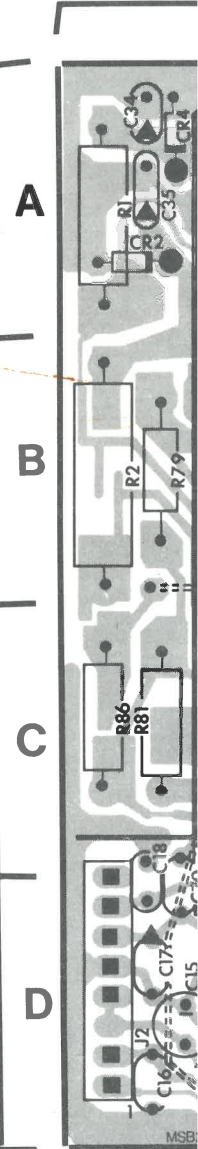
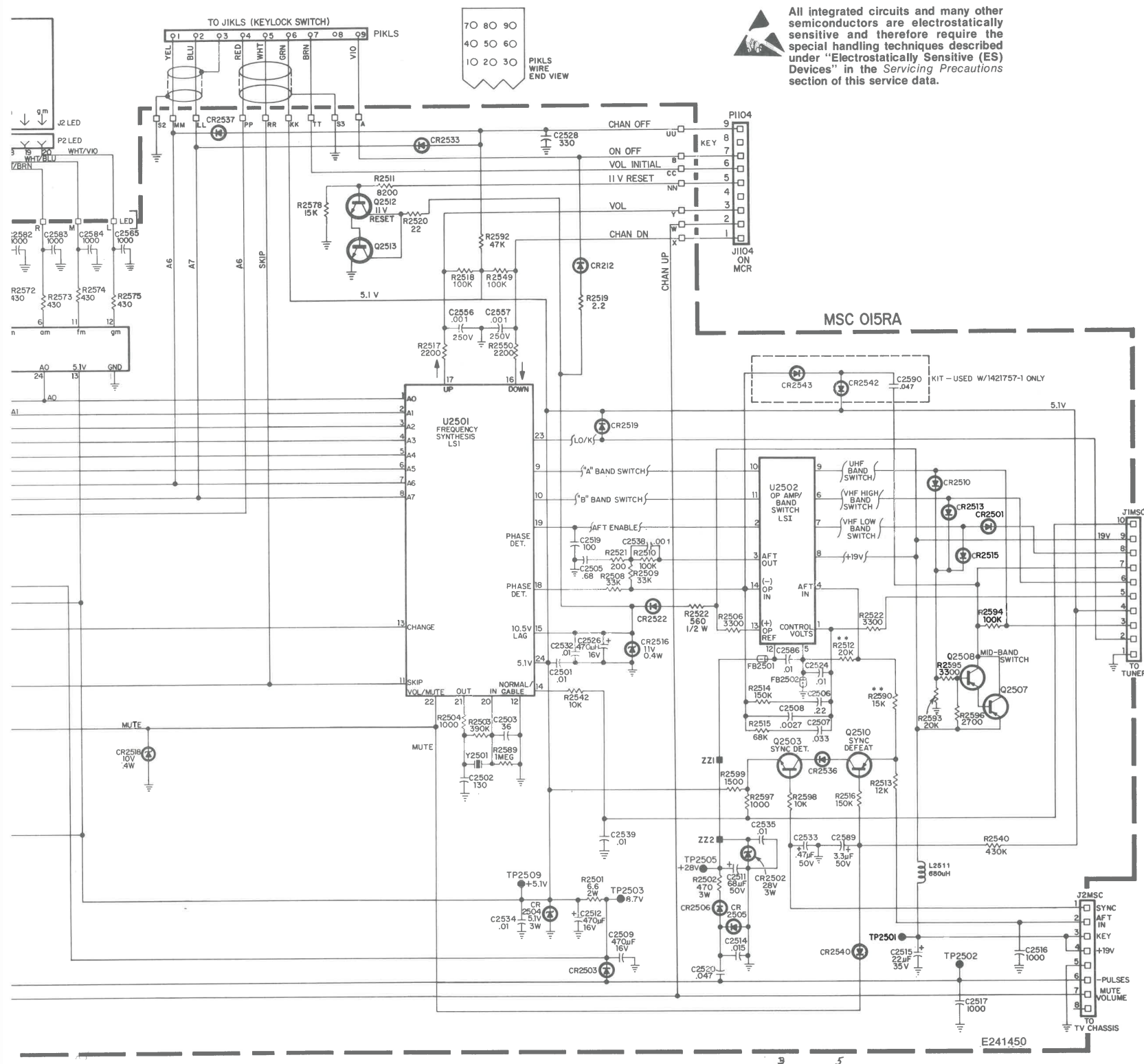


Fig. 8 — MSC015RA F.S. Tuner Control Module Schematic

SAFETY NOTICE
Basic Service Data.



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J2MSC

8	□
7	□
6	□
5	□
4	□
3	□
2	□
1	□

P2MSC

1	BRN
2	WHT
3	BLK
4	YEL/GRAY
5	KEY
6	RED
7	WHT

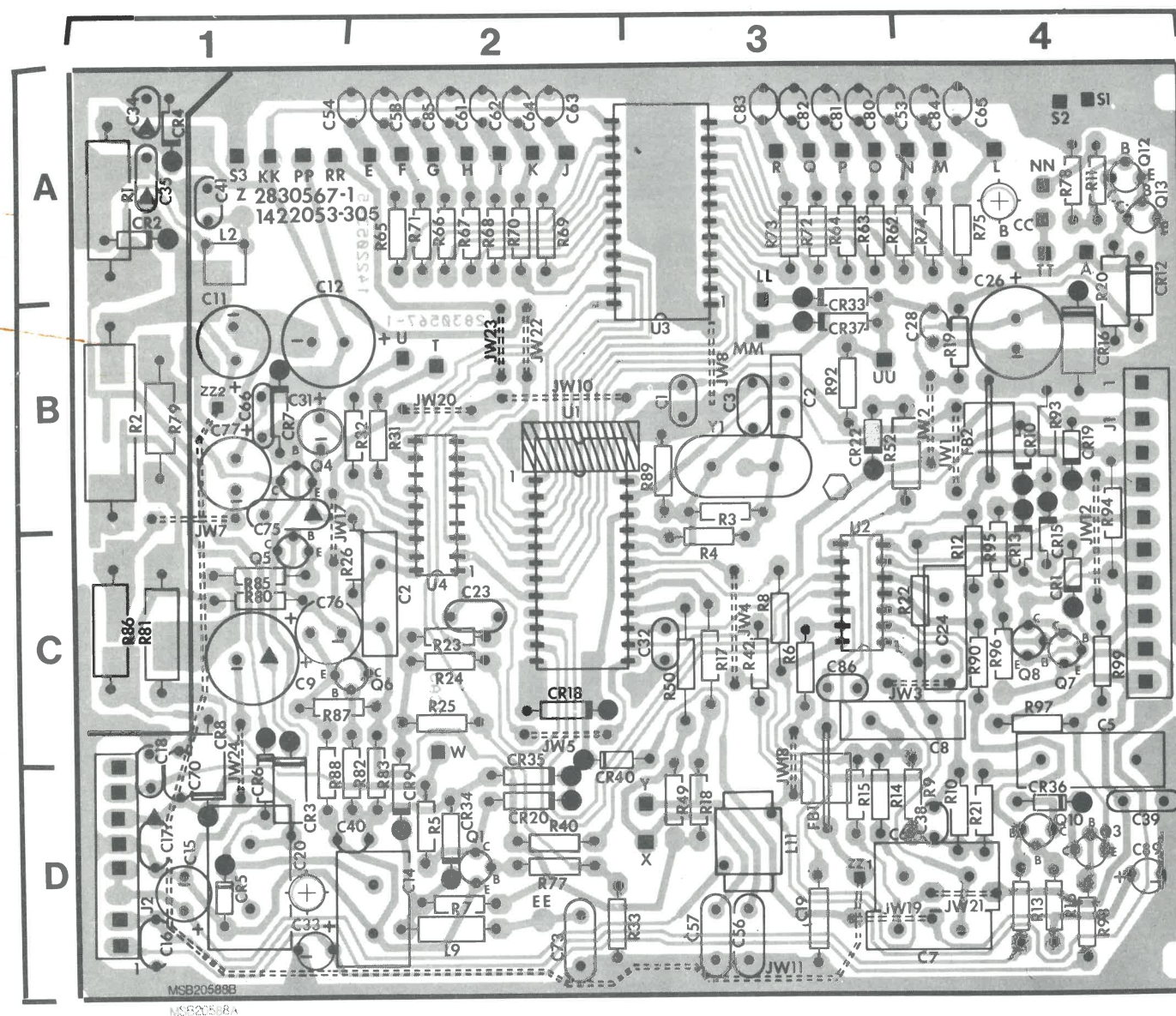
P302

7	MV
6	PULSE
5	KEY
4	SYNC
3	B+
2	AFT
1	GND

J302 CHASSIS

1	■
2	■
3	■
4	■
5	■
6	■
7	■

Fig. 9 — Chassis Interconnect Diagram



ADD 2500 SERIES PREFIX TO COMPONENT NUMBERS

Fig. 10 — MSC015RA (PW 2500) Tuner Control Module Circuit Board

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Add prefix **70** to **Tuner** stock numbers.
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- **Basic Service Data**—Chassis and tuning systems and most related parts and assemblies that do not differ from one model or model group to another.
- **Service Data Supplements**—Cabinet, auxiliary, and other parts and assemblies that differ from one model group to another.
- **Service Data Addendum**—Any parts additions, deletions, or other changes made after initial production.
Do not replace or order parts without first consulting any Addendum(s) that may have been issued since publication of this service data.

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
TUNING SYSTEM ASSEMBLIES			
TUNING ASSEMBLIES			
MST007RA			
MST007RA SAME AS PREVIOUSLY ISSUED IN 1983 CTC120 EXCEPT AS LISTED.			
MST 007RA	149798	2841828-501	MODULE COMPLETE
C24007	150724	2870613-214	★ CAPCD 1200PF Z5U 1.4KV
C24008	150724	2870613-214	★ CAPCD 1200PF Z5U 1.4KV
C24009	150724	2870613-214	★ CAPCD 1200PF Z5U 1.4KV
R24002	157308	2812886-007	★ RES CC 1/2W 10% 3.9M
	150720	2841853-501	★ BLOCK, ANTENNA COMPLETE
MST015RA			
MST 015RA	150479	2841828-508	MODULE COMPLETE
C156	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24001	143027	1491123-001	CAPCD 82PF J N1500 250V
C24002	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24003	134426	1442717-135	CAPCD 20PF K N750 100V
C24004	134426	1442717-135	CAPCD 20PF K N750 100V
C24005	143027	1491123-001	CAPCD 82PF J N1500 250V
C24006	147918	2870697-210	★ CAPCD 600PF M Z5U 1.4KV
C24007	147918	2870697-210	★ CAPCD 600PF M Z5U 1.4KV
C24008	147918	2870697-210	★ CAPCD 600PF M Z5U 1.4KV
C24009	147918	2870697-210	★ CAPCD 600PF M Z5U 1.4KV
C24011	119404	1442717-133	CAPCD 10PF J N470 100V
C24012	134430	1442718-001	CAPCD 1000PF GMV Z5U 100V
C24013	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24014	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24015	159663	1442718-009	CAPCD 150PF J Z5P 100V
C24016	151542	1442717-152	CAPCD 6.8PF J N150 100V
C24017	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24018	143027	1491123-001	CAPCD 82PF J N1500 250V
C24019	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24020	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24021	129972	1442717-110	CAPCD 2.2PF C NPO 100V
C24023	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24024	134426	1442717-135	CAPCD 20PF K N750 100V
C24025	125032	1442717-016	CAPCD 27PF J N750 100V
C24026	143853	1442717-163	CAPCD 6.8PF C NPO 100V
C24027	120832	945354-019	CAPCD 1000PF K Z5P 100V
C24028	120832	945354-019	CAPCD 1000PF K Z5P 100V
C24029	119402	1442717-001	CAPCD 3.3PF C NPO 100V
C24030	159757	1442717-161	CAPCD 3.3PF C N470 100V
C24031	120832	945354-019	CAPCD 1000PF K Z5P 100V
C24032	139181	1442717-065	CAPCD 5.6PF J N470 100V
C24033	103968	942454-127	CAPHL 82PF J Z5C 500V
C24034	249233	1442717-136	CAPCD 22PF J N750 100V
C24035	145676	2841241-483	CAPCD 68PF J NPO 50V
C24036	120832	945354-019	CAPCD 1000PF K Z5P 100V
C24037	129977	1442718-008	CAPCD 470PF M Z5P 100V

Replacement Parts Continued (See Product Safety Note on first page of this parts list)

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
C24115	120832	945354-019	CAPCD 1000PF K Z5P 100V
C24116	142887	1490529-002	CAP POLY .27UF K 100V
C24118	129977	1442718-008	CAPCD 470PF M Z5P 100V
C24119	159756	1442717-131	CAPCD 5.6PF J N150 100V
C24120	143689	1490529-009	CAP POLY .082UF K 100V
C24121	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24122	125032	1442717-116	CAPCD 27PF J N750 100V
C24123	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24124	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24125	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24126	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24127	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24128	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24129	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24130	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24131	143688	1490001-010	CAP LYTC 33UF R 25V
C24133	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24134	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24135	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24136	134437	1442717-140	CAPCD 1PF C NPO 100V
C24137	134437	1442717-140	CAPCD 1PF C NPO 100V
C24138	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24146	147918	2870697-210	★ CAPCD 600PF M Z5U 1.4KV
C24147	159757	1442717-101	CAPCD 3.3PF C NPO 100V
C24148	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24149	139181	1442717-027	CAPCD 5.6PF C NPO 100V
C24150	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24151	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24152	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24153	134437	1442717-140	CAPCD 1PF C NPO 100V
C24154	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
CR24001	119662	1471922-001	DIODE
CR24002	129095	1477022-002	DIODE
CR24005			THRU
CR24008	159588	2815555-002	DIODE MATCHED SET
CR24009	119662	1471922-001	DIODE
CR24010	119597	1471872-006	DIODE
CR24011	119597	1471872-006	DIODE
CR24012	129095	1477022-002	DIODE
CR24013			THRU
CR24016	137780	1477949-004	DIODE MATCHED SET
CR24017	129095	1477022-002	DIODE
CR24018			THRU
CR24021	147943	2812833-001	DIODE MATCHED SET
CR24022	129095	1477022-002	DIODE
CR24023	147943	2812833-001	DIODE
CR24024	129095	1477022-002	DIODE
CR24025	129095	1477022-002	DIODE
CR24026	129095	1477022-002	DIODE
CR24027	129095	1477022-002	DIODE
CR24028	129095	1477022-002	DIODE
CR24029	119597	1471872-006	DIODE
CR24030	129095	1477022-002	DIODE
CR24031	129095	1477022-002	DIODE
CR24032	129095	1477022-002	DIODE
CR24033	129095	1477022-002	DIODE
CR24034	143690	1477046-014	DIODE ZENER 19V
FB24001	150725	1443391-019	BEAD
FB24002	150725	1443391-019	BEAD
FB24003	150725	1443391-019	BEAD
FB24004	150725	1443391-019	BEAD
FB24005	152124	2843117-003	BEAD
FB24006	152103	2843117-002	BEAD
FB24008	152103	2843117-002	BEAD
FB24009	152103	2843117-002	BEAD
FB24011	152102	2843117-001	BEAD
FB24012	152103	2843117-002	BEAD
FB24013	152103	2843117-002	BEAD
FB24014	152103	2843117-002	BEAD
FB24015	152103	2843117-002	BEAD
FB24016	152102	2843117-001	BEAD
FB24017	152124	2843117-003	BEAD
FB24019	152103	2843117-002	BEAD
FB24020	152103	2843117-002	BEAD
FB24023	152103	2843117-002	BEAD
FB24024	152102	2843117-001	BEAD
FB24025	152103	2843117-002	BEAD
FB24026	152102	2843117-001	BEAD
FB24028	152102	2843117-001	BEAD
FB24030	152103	2843117-002	BEAD
FB24031	152103	2843117-002	BEAD
FB24032	152103	2843117-002	BEAD
FB24034	152124	2843117-003	BEAD
FB24035	152124	2843117-003	BEAD
FB24039	152124	2843117-003	BEAD
FB24040	152124	2843117-003	BEAD
FB24044	152102	2843117-001	BEAD
FB24045	152102	2843117-001	BEAD
FB24046	152124	2843117-003	BEAD

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
J24001	131222	1496154-001	CONNECTOR 1 PIN
L24015	119412	1442642-022	COIL 10UH
L24016	153393	2843295-001	COIL 12UH
L24017	153393	2843295-001	COIL 12UH
L24021	119412	1442642-022	COIL 10UH
L24052	150715	973969-033	COIL 1.8UH
L24053	150714	973969-032	COIL .97UH
L24055	153393	2843295-001	COIL 12UH
L24058	153393	2843295-001	COIL 12UH
P24001	150716	1466476-010	CONNECTOR
Q24001	146521	2811975-001	TRANSISTOR SUPERBAND RF AMP
Q24002	141370	1417377-003	TRANSISTOR SUPERBAND OSC
Q24003	141370	1417377-003	TRANSISTOR BAND 1,2,3 OSC
Q24004	148085	2814681-001	TRANSISTOR BAND 1,2,3 RF AMP
Q24005	146521	2811975-001	TRANSISTOR UHF RF AMP
Q24006	151693	1417392-001	TRANSISTOR 1ST UHF IF AMP
Q24007	151326	1417360-001	TRANSISTOR VHF OSC
Q24008	148085	2814681-001	TRANSISTOR ISOLATION AMP
Q24009	152500	2815513-001	TRANSISTOR BAND 1,2,3 MIXER AND 2ND UHF POST AMP
R24002	159662	2812886-007	★ RESCC 1/2W 10% 3.9M
R24003	159662	2812886-007	★ RESCC 1/2W 10% 3.9M
R24008	829522	993218-177	RES CF 1/4W 10% 2.2M
R24009	829412	993230-747	RES CF 1/4W 2% 120K
R24010	829416	993218-750	RES CF 1/4W 2% 160K
R24011	829139	993218-687	RES CF 1/4W 2% 390R
R24012	829215	993218-701	RES CF 1/4W 2% 1.5K
R24031	829412	993218-747	RES CF 1/4W 2% 120K
R24032	829416	993218-750	RES CF 1/4W 2% 160K
R24033	829139	993230-687	RES CF 1/4W 2% 390R
R24034	829215	993230-701	RES CF 1/4W 2% 1.5K
R24039	829522	993218-177	RES CF 1/4W 10% 2.2M
R24043	829139	993218-687	RES CF 1/4W 2% 390R
R24044	829139	993218-687	RES CF 1/4W 2% 390R
R24051	829215	993218-701	RES CF 1/4W 2% 1.5K
R24053	829522	993218-177	RES CF 1/4W 10% 2.2M
R24054	829412	993218-747	RES CF 1/4W 2% 120K
R24055	829416	993230-750	RES CF 1/4W 2% 160K
R24057	829215	993230-701	RES CF 1/4W 2% 1.5K
R24058	829139	993218-687	RES CF 1/4W 2% 390R
R24065	829362	993218-740	RES CF 1/4W 2% 62K
R24066	829410	993218-745	RES CF 1/4W 2% 100K
R24067	829139	993218-687	RES CF 1/4W 2% 390R
R24068	829123	993218-681	RES CF 1/4W 2% 220R
R24070	829143	993230-688	RES CF 1/4W 2% 430R
R24078	829333	993218-733	RES CF 1/4W 2% 33K
R24081	829433	993230-757	RES CF 1/4W 2% 330K
R24081	157949	2812886-010	★ RES CC 1/2W 10% 100K
R24087	159662	2812886-007	★ RESCC 1/2W 10% 3.9M
R24088	159662	2812886-007	★ RESCC 1/2W 10% 3.9M
S24002	157950	2870945-502	SWITCH ASSEMBLY
T24001	151544	2871391-001	TRANSFORMER
U24001	143696	2811550-001	IC PRESCALER
	159759	1477018-535	★ CABLE, COAXIAL COVER, OUTER
	157951	2830509-002	SPRING, BOTTOM COVER
	157147	2841830-004	SPRING, BOTTOM 'Z'
	157145	2841830-005	SPRING, BOTTOM 'Z'
	157146	2841829-002	SPRING, LARGE 'V'
	157148	2871399-002	SPRING, TOP COVER
TUNER CONTROL ASSEMBLY			
MSC015RA			
MSC 015RA	149704	2841954-510	MODULE COMPLETE
C2501	143884	1491409-30R	CAPCD .01UF Z Z5V

1983 CTC 120-S5 (I) REPLACEMENT PARTS

Replacement Parts Continued (See Product Safety Note on first page of this parts list)

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
C2528	146764	1491407-30M	CAPCD 330PF Z Z5P 50V
C2531	142772	2840362-163	CAP LYTC 10UF M 50V
C2532	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
C2533	146439	2841288-363	CAP LYTC .47UF M 50V
C2534	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
C2535	142768	1441023-121	CAPCD .01UF M Z5V 100V
C2538	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2539	142768	1441023-121	CAPCD .01UF M Z5V 100V
C2540	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
C2541	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2553	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2554	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2556	142768	1490136-41R	CAPCD .01UF M Z5V 250V
C2557	142768	1490136-41R	CAPCD .01UF M Z5V 250V
C2558	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2561	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2562	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2563	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2564	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2565	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2566	142768	1441023-121	CAPCD .01UF M Z5V 100V
C2570	143759	1490135-11N	CAPCD 1000PF M Z5U 250V
C2573	142768	1490136-41R	CAPCD .01UF M Z5V 250V
C2575	142768	1490136-41R	CAPCD .01UF M Z5V 250V
C2577	148873	2840362-181	CAP LYTC 10UF R 100V
C2580	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2581	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2582	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2583	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2584	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2585	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C2586	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
C2589	152830	2840361-463	CAP LYTC 3.3UF M 50V
CR2501	139706	1471872-008	DIODE
CR2502	156313	2870486-002	DIODE ZENER 30V
CR2503	142569	1476171-031	DIODE
CR2504	149797	1477046-028	DIODE ZENER 5.1V
CR2505	139706	1471872-008	DIODE
CR2506	139706	1471872-008	DIODE
CR2507	152869	1471898-017	DIODE ZENER 35V
CR2508	142569	1476171-031	DIODE
CR2509	119597	1471872-006	DIODE
CR2510	119597	1471872-006	DIODE
CR2512	137652	99203-002	DIODE
CR2513	119597	1471872-006	DIODE
CR2515	119597	1471872-006	DIODE
CR2516	145817	99202-217	DIODE ZENER 11V
CR2518	130047	99201-116	DIODE ZENER 10V
CR2519	119597	1471872-006	DIODE
CR2520	119597	1471872-006	DIODE
CR2522	119597	1471872-006	DIODE
CR2533	119597	1471872-006	DIODE
CR2534	119597	1471872-006	DIODE
CR2535	119597	1471872-006	DIODE
CR2536	119597	1471872-010	DIODE
CR2537	119597	1471872-006	DIODE
CR2540	119597	1471872-010	DIODE
FB2501	153328	2843165-004	BEAD
FB2502	153328	2843165-004	BEAD
J2501	151980	2860051-019	CONNECTOR 10 PIN
J2502	150700	2860056-301	CONNECTOR 8 PIN
L2502	153411	1447018-012	COIL 1.8UH
L2509	156370	2872884-042	COIL 10UH
L2511	146157	1447117-015	COIL 68UH
P1104	160073	2861609-304	CONNECTOR 9 PIN
P1KLS	136677	1466605-319	CONNECTOR 9 PIN
P1LED	147605	1467740-081	CONNECTOR 9 PIN
P1MPS	154364	2860742-004	CONNECTOR 5 PIN
P2BCD	157825	1474632-004	CONNECTOR 1 PIN
P2LED	147606	1467740-091	CONNECTOR 10 PIN
Q2501	146301	1417309-004	TRANSISTOR PROGRAMMING/MUTE
Q2503	153399	1417306-015	TRANSISTOR SYNC DETECT
Q2504	151974	1417303-005	TRANSISTOR MEMORY POWER DOWN
Q2505	142190	1417330-001	TRANSISTOR MEMORY POWER DOWN
Q2506	145410	1417330-015	TRANSISTOR MEMORY POWER DOWN
Q2507	153325	1417347-002	TRANSISTOR MID-BAND SWITCH
Q2508	142190	1417330-001	TRANSISTOR MID-BAND SWITCH
Q2510	145410	1417330-015	TRANSISTOR SYNC DEFEAT
Q2512	143793	1417306-011	TRANSISTOR 11V RESET
Q2513	148996	1417318-003	TRANSISTOR
R2501	145042	1447144-020	RES WW 2W 5% 6.6R
R2502	141244	1420347-141	RES WW 3W 5% 470R
R2512	829320	993218-728	RES CF 1/4W 2% 20K
R2513	829312	993218-723	RES CF 1/4W 2% 12K
R2519	152829	993284-333	RES MFFP 1/4W 5% 2.2R
R2579	830047	993290-193	* RES CFFP 1/2W 5% 47R

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
R2581	831282	993115-247	RES MFFP 1W 5% 8200R
R2586	831122	993115-209	RES MFFP 1W 5% 220R
R2589	829510	993218-469	RES CF 1/4W 5% 1M
R2590	829315	993218-725	RES CF 1/4W 2% 15K
U2501	157309	1421757-005	IC SYNTHESIZER
U2502	149870	1421716-002	IC OP AMP/BAND SWITCH
U2503	143766	1421719-001	IC LED DRIVER
U2504	148446	2843187-001	IC SCAN MEMORY
Y2501	158618	2816766-001	CRYSTAL
	110501	938321-006	CONTACT, P2BCD
	150698	2830548-002	COVER, BOTTOM
	150697	2830548-001	COVER, TOP
	139301	1479290-001	RETAINER, BEAD CHAIN
	123895	1442877-104	TERMINAL, FEMALE P1KLS

REMOTE CONTROL ASSEMBLY
MCR018A

MCR 018RA	151899	2842230-501	MODULE COMPLETE
C1101	143759	1490135-11N	CAPCD 1000PF M Z5U 250V
C1102	147037	2840363-351	CAP LYTC 220UF PF 35V
C1103	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
C1104	143752	2840363-531	CAP LYTC 470UF R 16V
C1105	138144	1472442-107	CAP POLY .0033UJ 200V
C1106	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
C1107	146042	2871335-079	CAP POLY .22UF K 100V
C1108	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
C1109	141868	2840361-163	CAP LYTC 1UF M 50V
C1110	141868	2840361-163	CAP LYTC 1UF M 50V
C1111	152853	2871335-169	CAP POLY .68UF J 100V
C1112	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
C1114	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
C1115	149923	2840362-533	CAP LYTC 47UF M 16V
C1116	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
C1117	154328	2840361-362	CAP LYTC 2.2UF N 50V
C1118	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
C1119	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
C1120	146256	2840362-143	CAP LYTC 10UF M 25V
C1121	146256	2840362-143	CAP LYTC 10UF M 25V
C1122	146259	2840363-141	CAP LYTC 100UF R 25V
C1123	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
C1124	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
C1125	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
C1126	127477	2840363-321	CAP LYTC 220UF PF 10V
C1127	141868	2840361-163	CAP LYTC 1UF M 50V
C1128	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
C1129	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
C1130	146439	2841288-363	CAP LYTC .47UF M 50V
C1131	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
C1132	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
C1133	146042	2871335-079	CAP POLY .22UF K 100V
C1134	152830	2840361-463	CAP LYTC 3.3UF M 50V
C1135	143884	1491409-30R	CAPCD .01UF Z Z5V 50V
C1136	148067	1491407-52M	CAPCD 470PF K Z5P 50V
CL3	139301	1479290-001	RETAINER BEAD CHAIN

CR1101	137652	99203-002	DIODE
CR1102	146273	99202-210	DIODE ZENER 5.6V
CR1103	139706	1471872-008	DIODE
CR1104	152854	99202-107	DIODE ZENER 4.3V
CR1105	139706	1471872-008	DIODE
CR1106	139706	1471872-008	DIODE
CR1108	139706	1471872-008	DIODE
CR1109	139706	1471872-008	DIODE
CR1110	139706	1471872-008	DIODE
CR1111	139706	1471872-008	DIODE
CR1112	139706	1471872-008	DIODE
CR1113	139706	1471872-008	DIODE
CR1114	139706	1471872-008	DIODE
CR1115	139706	1471872-008	DIODE
CR1116	143595	1476179-005	DIODE
CR1117	139706	1471872-008	DIODE
CR1118	139706	1471872-008	DIODE
CR1119	139706	1471872-008	DIODE
CR1120	139706	1471872-008	DIODE
CR1121	139706	1471872-008	DIODE
K1	145591	1466660-007	* RELAY
L1101	146157	1447117-015	COIL 68UH
L1102	156370	1496280-042	COIL 10UH
OPT1101	152855	2860041-001	* CIRCUIT OPTO COUPLER
P1MCR	119391	1461635-012	CONNECTOR 2 PIN
P2MCR	122675	1461635-022	CONNECTOR
Q1101	143806	1417347-004	TRANSISTOR STANDBY POWER OSC
Q1102	146847	1417306-013	TRANSISTOR DET AMP
Q1103	146847	1417306-013	TRANSISTOR RELAY DRIVER
Q1104	146847	1417306-013	TRANSISTOR START CHAN RESET GATE

Continued on next page

1983 CTC 120-S5 (I) REPLACEMENT PARTS

Replacement Parts Continued (See Product Safety Note on first page of this parts list)

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
Q1105	146847	1417306-013	TRANSISTOR ON DRIVE
Q1106	146847	1417306-013	TRANSISTOR ON/OFF FF
Q1107	146847	1417306-013	TRANSISTOR ON/OFF FF
Q1108	143802	1417330-010	TRANSISTOR VOL BUFFER
Q1109	146847	1417306-013	TRANSISTOR OFF TRIG
Q1110	146847	1417306-013	TRANSISTOR TURN OFF INHIBIT
Q1111	143802	1417330-010	TRANSISTOR CT OSC
Q1112	143802	1417330-010	TRANSISTOR CT OSC
Q1113	146847	1417306-013	TRANSISTOR POWER ON RESET
Q1114	146847	1417306-013	TRANSISTOR END OF COUNT REG/SW

R1	160074	2812886-005	* RES WW 5% 5W 220R
R1101	141226	1447144-016	RES WW 3W 5% 150R
R1105	829510	993218-469	RES CF 1/4W 5% 1M
R1107	139776	946023-003	RES WW 2W 10% 12R
R1143	829351	993218-738	RES CF 1/4W 2% 51K
R1144	829410	993218-745	RES CF 1/4W 2% 100K
R1145	829420	993218-752	RES CF 1/4W 2% 200K
R1146	829439	993218-759	RES CF 1/4W 2% 390K

T1	152852	1466469-007	* TRANSFORMER & P3MCR
T1101	152856	1462277-008	COIL

U1101	152857	1465635-002	IC UP-DOWN COUNTER
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	118414	1442877-201	TERMINAL MALE P2MCR
	123895	1442877-101	TERMINAL, FEMALE P1MCR,P2MCR

INSTRUMENT ASSEMBLIES

JJR962WR			
C1	147918	2870697-210	* CAPCD 600PF M Z5U 1.4KV
C2	147918	2870697-210	* CAPCD 600PF M Z5U 1.4KV
C424	156249	2843149-502	CAP WIDTH ASSEMBLY
CR1	119597	1471872-006	DIODE
CR2	119597	1471872-006	DIODE
F101	154521	2813593-001	* FUSE 5A
J1	150722	2871835-002	* CONNECTOR
J1KLS	148903	1466605-029	CONNECTOR
J1MCR	122675	1461635-022	CONNECTOR
J3MCR	130252	1461635-024	CONNECTOR
J2006	112653	1440476-001	CONNECTOR
L101	154301	1496553-504	* COIL
L102	148491	1463890-507	* COIL DEGAUSSING
P1S4B	154364	2860742-004	CONNECTOR
P2MCR	119391	1461635-012	CONNECTOR
P2MSC	158237	2861607-305	CONNECTOR
P104	158677	2861681-008	CONNECTOR DEGAUSSING
P201	158236	2861603-300	CONNECTOR
P202	157354	2861604-303	CONNECTOR
P302	158237	2861607-305	CONNECTOR
P401	153788	2831216-001	* CONNECTOR QUAD YOKE
P501	158678	2861681-001	* CONNECTOR DUAL YOKE
P701	158238	2861607-306	CONNECTOR
P1102	158604	2861605-102	CONNECTOR

Q1	142711	1417306-001	TRANSISTOR
R1	502539	82283-105	* RES CC 1/2W 5% 3.9M
R2	502539	82283-105	* RES CC 1/2W 5% 3.9M
R3	502539	82283-105	* RES CC 1/2W 5% 3.9M
R4	502539	82283-105	* RES CC 1/2W 5% 3.9M
R2002	145304	1472268-041	* RES CONTROL VOL LIMITER
R4202	147612	1473369-002	* RES CONTROL BRIGHTNESS
R4203	147613	1473369-004	* RES CONTROL COLOR
R4204	147613	1473369-004	* RES CONTROL TINT
R4207	149925	1473369-005	* RES CONTROL CONTRAST



FILE
1983
CTC 120 — S6

Color Television Supplement Service Data

CTC 120 Series

RCA Corporation Consumer Electronics

Technical Publications
P.O. Box 1976 | Indianapolis, Indiana 46206

RCA Inc.

Technical Publications
5575 Royalmount Avenue | Town of Mount-Royal | Quebec, Canada H4P 1J8

Canada Stock Numbers:

Add prefix **64** to **Module** stock numbers.
Add prefix **70** to **Tuner** stock numbers.
Add prefix **62** to **all other** stock numbers.

SAFETY NOTICE USE ISOLATION TRANSFORMER WHEN SERVICING

Components having special safety characteristics are identified by shading on schematics and by ★ stars on the parts list in this Service Data and its supplements and bulletins. Before servicing this chassis, it is important that the service technician read and follow the "Safety Precautions" and "Product Safety Notices" in this Service Data.

★ For continued x-radiation protection, replace picture tube with original type or RCA-approved equivalent type. If field replacement of picture tube is required, an ADJUSTABLE TYPE BEAM BENDER must be ordered and installed on the neck of the replacement picture tube. Consult parts list for correct stock number.

Model-To-Major Assembly Cross Reference

MODEL	CHASSIS	TUNER CONTROL	TUNER VHF/UHF MULTIBAND	PICTURE TUBE	REMOTE
GJC 650T	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJC 654H	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJC 654L	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJC 658P	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJR 639PR	CTC 120A	MSC012RA	MST007RA	★25VGDP22	MCR016RA/CRK28G
GJR 751TR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR017AREV.1/CRK33H
GJR 756HR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR017AREV.1/CRK33H
GJR 759PR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR017AREV.1/CRK33H

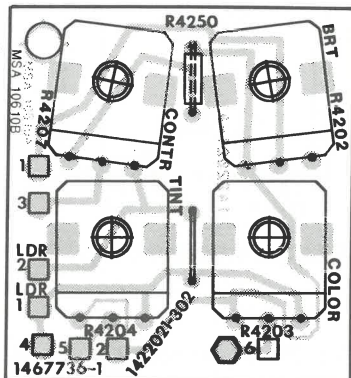


Fig. 1 — Auxiliary Control Circuit Board

This is a Supplement Service Data. It covers model-related information and any exceptions to the Basic Service Data 1983 CTC 120

See Basic Service Data for additional disassembly instructions.

Auxiliary Control Assembly Removal

Remove one 1/4" hex head screw. Pull assembly straight back and out of instrument (remove P701 from chassis).

Note: LDR leads are attached to PW 4200 board.

Frequency Synthesis Tuner and Control Assembly Removal

Remove interconnect plug and cable assemblies.

P2MSC from J2MSC (on MSC module).
P1BCD from Channel Switch Assembly.
P2BCD (remote version) from Channel Switch Assembly.
P1MCR (remote version) from MCR module.
P1MPS (remote version) from keyboard assembly.
P1LED from LED Channel Display Assembly.
P2LED from LED Channel Display Assembly.
P3MSC From MSC assembly
I-F Cable Assembly from J24001 (on MST Tuner Module).
P1101 From MCR016A

Remove VHF antenna (leads or cable) from antenna block.
Remove UHF antenna leads from UHF terminals.
Remove one (1) 1/4" hex head screw at rear of tuning assembly and remove one (1) 1/4" hex head screw at front of assembly (below P2MSC connector). Pull assembly back slightly and lift out of instrument.

LED Display Removal

Using needle nose pliers grasp spring mounting clip by leaf tab and pull spring clip off plastic mounting stud. Removal of one

spring clip is sufficient. An alternate method is to use a thin pointed object and slip under the edge of the spring clip and pry loose from plastic mounting stud. Disconnect P1LED and P2LED connectors from LED Board.

Note: Care is required in removal of the spring clip so as to not break off plastic mounting stud.

MCR 015/017 Removal

Push spring clips (detented in notches on sides of MCR circuit board and withdraw board to the rear. Disconnect P106 (from J106 on chassis, P3MCR (from keyboard) and P1MCR (from MSC module).

MCR016 Removal

Disconnect P1101, P1102, P1103 and P1MCR. Remove one screw at front of assembly. Slide assembly forward and lift up.

LDR Assembly Removal

This assembly is held in place by one (1) 1/4" screw. The screw and assembly must be removed from the rear.

Keyboard Assembly Removal

Remove the manual keyboard (manual versions) and remote tuning switch keyboard (remote versions) by first removing four (4) 1/4" screws. Disconnect P1MPS, P1BCD, P2BCD connectors. The assembly can then be removed from rear of the cabinet front.

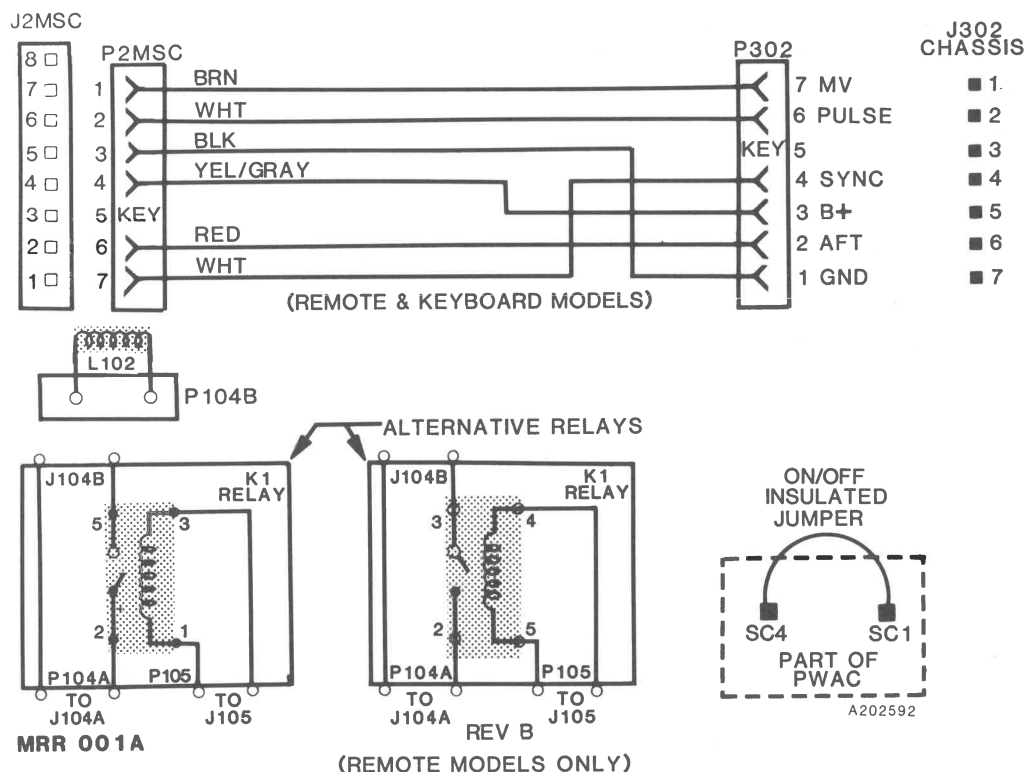


Fig. 2 — Interconnect Diagram

REPLACEMENT PARTS

BEFORE REPLACING PARTS, READ THE FOLLOWING:

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Warranty replacement of cabinet parts requires prior approval of RCA.

Warranty Status and Specifications of assemblies and parts are subject to change without notice.

PRODUCT SAFETY NOTE—Components marked with a (★) have special characteristics important to safety. Before replacing any of these components, read carefully the **PRODUCT SAFETY NOTICE** in the Basic Service Data. Do not degrade the safety of the set through improper servicing. Although assemblies as a whole may not be marked with a (★), replacement of RCA assemblies with other assemblies not RCA approved may result in a safety hazard.

Canada Stock Numbers:

Add prefix **64** to **Module** stock numbers.

Add prefix **70** to **Tuner** stock numbers.

Add prefix **62** to **all other** stock numbers.

.....AVOID REPLACEMENT PART ERRORS.....

File supplements and addendums immediately upon receipt, and consult the parts lists in them before ordering parts.

NOTE: For complete coverage of all parts and assemblies used in instruments equipped with the chassis series to which this service data relates, consult the following publications:

● **Basic Service Data**—Chassis and tuning systems and most related parts and assemblies that do not differ from one model or model group to another.

● **Service Data Supplements**—Cabinet, auxiliary, and other parts and assemblies that differ from one model group to another.

● **Service Data Addendum**—Any parts additions, deletions, or other changes made after initial production.

Do not replace or order parts without first consulting any Addendum(s) that may have been issued since publication of this service data.

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
INSTRUMENT ASSEMBLIES			
		GJR639PR	
		GJC650T	
		GJC654H	
		GJC654L	
		GJC658P	
		GJR751TR	
		GJR756HR	
		GJR759PR	
C424	156249	2843149-502	CAP WIDTH ASSEMBLY
F101	154521	2813593-001	★ FUSE 5A
J1MCR	118750	1461635-013	CONNECTOR
K1	147696	1458751-502	RELAY
L101	154301	1496553-504	★ COIL
L102	148493	1463890-509	★ COIL DEGAUSSING
P1SVS	157824	2860742-005	CONNECTOR
P2MSC	158237	2861607-305	CONNECTOR
P101	159276	2860026-009	CONNECTOR
P104	158677	2861681-008	CONNECTOR DEGAUSSING
P201	157814	2861602-300	CONNECTOR
P202	157354	2861604-303	CONNECTOR
P302	158237	2861607-305	CONNECTOR
P401	153788	2831216-001	★ CONNECTOR QUAD YOKE
P501	158678	2861681-001	★ CONNECTOR DUAL YOKE
P701	158238	2861607-306	CONNECTOR
P1103	158679	2861623-208	CONNECTOR
R118	147872	945313-160	RES REMOTE POWER
R4201	143294	1472207-104	★ RES CONTROL VOL W/S4201
R4202	147612	1473369-002	★ RES CONTROL BRIGHTNESS
R4203	147613	1473369-004	★ RES CONTROL COLOR
R4204	147613	1473369-004	★ RES CONTROL TINT
R4207	149925	1473369-005	★ RES CONTROL CONTRAST
S4201			PART OF R4201
V101	2814627-001		★ PICTURE TUBE 25VGDP22

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
	158682	2831304-039	★ BACK, COVER GJR639PR 24.14IN. HIGH
	159389	2831304-50	★ BACK, COVER GJR639PR 25.14IN. HIGH
	157498	2831304-027	★ BACK, COVER GJC650T
	157490	2831304-028	★ BACK, COVER GJC654H, GJC654L, GJC658P
	159867	2831304-049	★ BACK, COVER GJR751TR
	158288	2831304-041	★ BACK, COVER GJR756HR, GJR759PR
		2817304-002	BOOK, INSTRUCTION GJR639PR
		2817966-001	BOOK, INSTRUCTION GJC650T, GJC654H, GJC654L, GJC658P
		2817322-001	BOOK, INSTRUCTION GJR751TR, GJR756HR, GJR759PR
	154300	2840554-506	CABLE, AC POWER
	156270	1439369-007	CAP, KINE COVER
	128573	1446199-001	CASTER
	150471	1458752-502	CIRCUIT, AUX CONTROL
	143659	1491017-001	CLAMP, BEAM BENDER/YOKE
	158671	2844180-001	CLIP, INDICATOR MTG
	141701	1448623-003	CLIP, MYC MTG
	147821	2870635-001	CLIP, REMOTE RECEIVER MTG
	157894	1467638-022	DOOR, AUX CONTROL GJR639PR
	152524	1467638-009	DOOR, AUX CONTROL GJC650T
	154393	1467638-019	DOOR, AUX CONTROL GJC654H
	152531	1467638-012	DOOR, AUX CONTROL GJC654L
	157893	1467638-023	DOOR, AUX CONTROL GJC658P
	153887	2860092-001	DOOR, AUX CONTROL GJR751TR
	157618	2860092-006	DOOR, AUX CONTROL GJR756HR
	157622	2860092-007	DOOR, AUX CONTROL GJR759PR
	153781	1467748-005	FRAME, CHASSIS MTG
	134554	1442093-004	GLIDE
	138785	1447321-006	GROMMET, FOR KINE SHIELD
	143459	1496207-001	GROMMET, MST/MSC MTG
	147685	1466408-002	INDICATOR, READ OUT
	153782	2860711-001	INSULATOR, SERVICE CONTROLS
	143735	1495121-514	★ KNOB, ON/VOL
	159882	1438352-202	★ MASK, BASIC GJR639PR *USE WITH BACK 2831304-39
			★ MASK, BASIC GJR639PR *USE WITH BACK 2831304-50
	157895	1438352-099	MAGNET, BEAM BENDER
	145381	1463762-502	★ MASK, BASIC GJC650T
	158277	1438352-062	★ MASK, BASIC GJC654H
	158278	1438352-063	★ MASK, BASIC GJC654L
	158279	1438352-064	★ MASK, BASIC GJC658P
	157516	1438352-098	★ MASK, BASIC GJR751TR
	159868	1438352-203	★ MASK, BASIC GJR756HR
	159869	1438352-201	★ MASK, BASIC GJR759PR
	158607	1438352-095	NUT, CONTROL MTG
	114918	990327-128	NUT, SPEAKER MTG
	124338	1403390-405	OVERLAY, CHAN/VOL GJR639PR
	148028	2870627-001	OVERLAY, LOGO
	157515	2840515-004	
	156336		PULL DECORATIVE GJR639PR, GJR759PR

Continued on next page

REPLACEMENT PARTS

Replacement Parts Continued (See Product Safety Note on first page of this parts list)

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION	SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
	142415		PULL, DECORATIVE GJC654H,GJC654L		153837	2842234-504	GJC654L,GJC658P SWITCH, PROGRAM GJR639PR
	153804		PULL, DECORATIVE GJC658P		153892	2841813-505	SWITCH, TUNING GJR751TR,GJR756HR,GJR759PR
	156341		PULL, DECORATIVE GJR756HR		160295	2843301-003	TRIM GJR751TR
	151414	2841836-505	RES LIGHT DETECTING		157500	1468918-007	WINDOW, READOUT GJR639PR
	139301	1420183-004	RETAINER, BEAD CHAIN		147985	2870602-001	WINDOW, READOUT GJC650T,GJC654H, GJC654L,GJC658P
	154435	1479290-011	RETAINER, WIRE TIE		153893	2871987-001	WINDOW, READOUT GJR751TR, GJR756HR, GJR759PR
	149552	2871314-001	★ SCREW, KINE MTG		153243	1463773-506	★ YOKE
	151424	2841874-501	SHIELD, KINE HOOD				
	134635	1408772-001	SOCKET, CASTER GJR639PR				
	148073	1467914-001	SOCKET, CASTER GJC650T,GJC654L,GJC658P, GJR756HR,GJR759PR				
	145134	1491493-002	SPRING, MCY RETAINER				
	141648	1449759-003	STOP, DOOR				
	151425	2842237-504	SWITCH, CHAN/VOL GJR639PR				
	152794	2842238-503	SWITCH, KEYBOARD GJC650T,GJC654H,				

*NOTE: BACK DRAWING NUMBER AT LOWER LEFT CORNER



FILE
1983
CTC 120 — S6
Addendum 1

Color Television Supplement Service Data

CTC 120 Series

RCA Corporation Consumer Electronics

Technical Publications
P.O. Box 1976 | Indianapolis, Indiana 46206

RCA Inc.

Technical Publications
5575 Royalmount Avenue | Town of Mount-Royal | Quebec, Canada H4P 1J8

Canada Stock Numbers:

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Add prefix **70** to **Tuner** stock numbers.
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★ For continued x-radiation protection, replace picture tube with original type or RCA-approved equivalent type. If field replacement of picture tube is required, an ADJUSTABLE TYPE BEAM BENDER must be ordered and installed on the neck of the replacement picture tube. Consult parts list for correct stock number.

Model-To-Major Assembly Cross Reference

MODEL	CHASSIS	TUNER CONTROL	TUNER VHF/UHF MULTIBAND	PICTURE TUBE	REMOTE
GJC 650T	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJC 654H	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJC 654L	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJC 658P	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJR 639PR	CTC 120A	MSC012RA	MST007RA	★25VGDP22	MCR017AREV.1/CRK33H
GJR 641PR	CTC 120A	MSC012RA	MST007RA	★25VGDP22	MCR017AREV.1/CRK33H
GJR 649PR	CTC 120A	MSC012RA	MST007RA	★25VGDP22	MCR017AREV.1/CRK33H
GJR 683T	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJR 684TR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR016RA/CRK28G
GJR 750T	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJR 751TR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR016RA/CRK28G
GJR 755H	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJR 756HR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR016RA/CRK28G
GJR 758P	CTC 120A	MSC011A	MST007RA	★25VGDP22	
GJR 759PR	CTC 120A	MSC013RA	MST007RA	★25VGDP22	MCR016RA/CRK28G

This is a Supplement Service Data. It covers model-related information and any exceptions to the Basic Service Data 1983 CTC 120

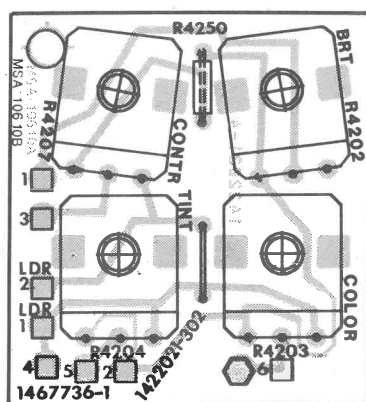


Fig. 1 — Auxiliary Control Circuit Board

See Basic Service Data for additional disassembly instructions.

Auxiliary Control Assembly Removal

Remove one 1/4" hex head screw. Pull assembly straight back and out of instrument (remove P701 from chassis).

Note: LDR leads are attached to PW 4200 board.

Frequency Synthesis Tuner and Control Assembly Removal

Remove interconnect plug and cable assemblies.

P2MSC from J2MSC (on MSC module).
 P1BCD from Channel Switch Assembly.
 P2BCD (remote version) from Channel Switch Assembly.
 P1MCR (remote version) from MCR module.
 P1MPS (remote version) from keyboard assembly.
 P1LED from LED Channel Display Assembly.
 P2LED from LED Channel Display Assembly.
 P3MSC From MSC assembly
 I-F Cable Assembly from J24001 (on MST Tuner Module).
 P1101 From MCR016A

Remove VHF antenna (leads or cable) from antenna block.

Remove UHF antenna leads from UHF terminals.

Remove one (1) 1/4" hex head screw at rear of tuning assembly and remove one (1) 1/4" hex head screw at front of assembly (below P2MSC connector). Pull assembly back slightly and lift out of instrument.

LED Display Removal

Using needle nose pliers grasp spring mounting clip by leaf tab and pull spring clip off plastic mounting stud. Removal of one spring clip is sufficient. An alternate method is to use a thin pointed object and slip under the edge of the spring clip and pry loose from plastic mounting stud. Disconnect P1LED and P2LED connectors from LED Board.

Note: Care is required in removal of the spring clip so as to not break off plastic mounting stud.

MCR 015/017 Removal

Push spring clips (detented in notches on sides of MCR circuit board and withdraw board to the rear. Disconnect P106 (from J106 on chassis, P3MCR (from keyboard) and P1MCR (from MSC module).

MCR016 Removal

Disconnect P1101, P1102, P1103 and P1MCR.

Remove one screw at front of assembly. Slide assembly forward and lift up.

LDR Assembly Removal

This assembly is held in place by one (1) 1/4" screw. The screw and assembly must be removed from the rear.

Keyboard Assembly Removal

Remove the manual keyboard (manual versions) and remote tuning switch keyboard (remote versions) by first removing four (4) 1/4" screws. Disconnect P1MPS, P1BCD, P2BCD connectors. The assembly can then be removed from rear of the cabinet front.

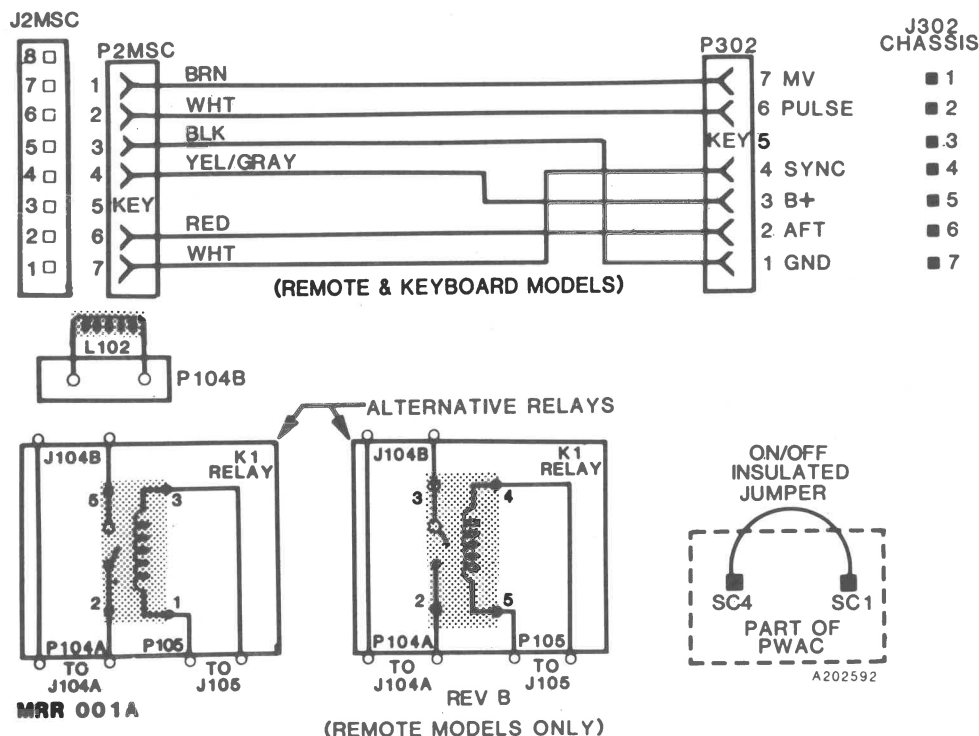


Fig. 2 — Interconnect Diagram

REPLACEMENT PARTS

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Canada Stock Numbers:

Add prefix **64** to **Module** stock numbers.

Add prefix **70** to **Tuner** stock numbers.

Add prefix **62** to **all other** stock numbers.

.....AVOID REPLACEMENT PART ERRORS.....

File supplements and addendums immediately upon receipt, and consult the parts lists in them before ordering parts.

NOTE: For complete coverage of all parts and assemblies used in instruments equipped with the chassis series to which this service data relates, consult the following publications:

● **Basic Service Data**—Chassis and tuning systems and most related parts and assemblies that do not differ from one model or model group to another.

● **Service Data Supplements**—Cabinet, auxiliary, and other parts and assemblies that differ from one model group to another.

● **Service Data Addendum**—Any parts additions, deletions, or other changes made after initial production.

Do not replace or order parts without first consulting any Addendum(s) that may have been issued since publication of this service data.

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION	SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
INSTRUMENT ASSEMBLIES				P302	158237	2861607-305	CONNECTOR
				P401	153788	2831216-001	★ CONNECTOR QUAD YOKE
				P501	158678	2861681-001	★ CONNECTOR DUAL YOKE
				P701	158238	2861607-306	CONNECTOR
				P1103	161280	2844608-302	CONNECTOR
				R118	147872	945313-160	RES REMOTE POWER
				R4201	143924	1472207-104	★ RES CONTROL VOL W/S4201
				R4202	147612	1473369-002	★ RES CONTROL BRIGHTNESS
				R4203	147613	1473369-004	★ RES CONTROL COLOR
				R4204	147613	1473369-004	★ RES CONTROL TINT
				R4207	149925	1473369-005	★ RES CONTROL CONTRAST
				S4201			PART OF R4201
				V101		2814627-001	★ PICTURE TUBE 25VGD22
					158682	2831304-039	★ BACK, COVER GJR639PR 24.14 IN. HIGH
					159389	2831304-50	★ BACK, COVER GJR639PR 25.14 IN. HIGH
					157495	2831304-036	BACK, COVER GJR641PR
					157498	2831304-027	★ BACK, COVER GJC650T, GJR683T, GJR684TR
					157490	2831304-028	★ BACK, COVER GJC654H, GJC654L, GJC658P, GJR649PR
					159867	2831304-049	★ BACK, COVER GJR750T, GJR751TR
					158288	2831304-041	★ BACK, COVER GJR755H, GJR756HR, GJR758P, GJR759PR
						2817304-002	BOOK, INSTRUCTION GJR639PR, GJR641PR, GJR649PR
						2817966-001	BOOK, INSTRUCTION GJC650T, GJC654H, GJC654L, GJC658P
						2817321-001	BOOK, INSTRUCTION GJR683T, GJR750T, GJR755H, GJR758P
						2817322-001	BOOK, INSTRUCTION GJR684TR, GJR751TR, GJR756HR, GJR759PR
					154300	2840554-506	CABLE, AC POWER
					156270	1439369-007	CAP, KINE COVER
					128573	1446199-001	CASTER
					150471	1458752-502	CIRCUIT, AUX CONTROL
					143659	1491017-001	CLAMP, BEAM BENDER/YOKE
					158671	2844180-001	CLIP, INDICATOR MTG
					141701	1448623-003	CLIP, MCY MTG
					147821	2870635-001	CLIP, REMOTE RECEIVER MTG
					157894	1467638-022	DOOR, AUX CONTROL GJR639PR
					152524	1467638-009	DOOR, AUX CONTROL GJC650T, GJR683T, GJR750T
					154393	1467638-019	DOOR, AUX CONTROL GJC654H, GJR755H
					152531	1467638-012	DOOR, AUX CONTROL GJC654L
					157893	1467638-023	DOOR, AUX CONTROL GJC658P, GJR758P
					153887	2860092-001	DOOR, AUX CONTROL GJR751TR
					157618	2860092-006	DOOR, AUX CONTROL GJR756HR
					157622	2860092-007	DOOR, AUX CONTROL GJR759PR
					153781	1467748-005	FRAME, CHASSIS MTG
C424	156249	2843149-502	CAP WIDTH ASSEMBLY				
F101	154521	2813593-001	★ FUSE 5A				
J1MCR	118750	1461635-013	CONNECTOR				
K1	147696	1458751-502	RELAY				
L101	154301	1496553-504	★ COIL				
L102	148493	1463890-509	★ COIL DEGAUSSING				
P1SVS	157824	2860742-005	CONNECTOR				
P2MSC	158237	2861607-305	CONNECTOR				
P101	157149	2861681-009	CONNECTOR				
P104	158677	2861681-008	CONNECTOR DEGAUSSING				
P201	157814	2861602-300	CONNECTOR				
P202	157354	2861604-303	CONNECTOR				

Continued on next page

REPLACEMENT PARTS

Replacement Parts Continued (See Product Safety Note on first page of this parts list)

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION	SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
134554	1442093-004		GLIDE	153804			PULL DECORATIVE GJC658P
138785	1447321-006		GROMMET, FOR KINE SHIELD	156341			PULL DECORATIVE GJR755H,
143459	1496207-001		GROMMET, MST/MSG MTG				GJR756HR
147685	1466408-002		INDICATOR, READ OUT	151414	2841836-505		RES LIGHT DETECTING
153782	2860711-001		INSULATOR, SERVICE CONTROLS	139301	1420183-004		RETAINER, BEAD CHAIN
143735	1495121-514	*	* KNOB, ON/VOL	154435	1479290-011		RETAINER, WIRE TIE
153895			KNOB DECORATIVE GJR649PR	149552	2871314-001	*	* SCREW, KINE MTG
159882	1438352-202	*	* MASK, BASIC GJR639PR	151424	2841874-501		SHIELD, KINE HOOD
		*	*	134635	1408772-001		SOCKET, CASTER GJR639PR
157895	1438352-099	*	* MASK, BASIC GJR639PR	148073	1467914-001		SOCKET, CASTER GJC650T,
		*	*				GJC654L, GJC658P, GJR756HR,
145381	1463762-502		MAGNET, BEAM BENDER				GJR759PR
158277	1438352-062	*	* MASK, BASIC GJC650T, GJR641PR	145134	1491493-002		SPRING, MCY RETAINER
158278	1438352-063	*	* MASK, BASIC GJC654H	141648	1449759-003		STOP, DOOR
158279	1438352-064	*	* MASK, BASIC GJC654L	151425	2842237-504		SWITCH, CHAN/VOL GJR639PR
MK0026	1438352-212	*	* MASK, BASIC GJR750T	152794	2842238-503		SWITCH, KEYBOARD GJC650T,
158284	1438352-073	*	* MASK, BASIC GJR758P				GJC654H, GJR683T, GJC654L,
158287	1438352-074	*	* MASK, BASIC GJR755H				GJC658P
157516	1438352-098	*	* MASK, BASIC GJC658P	153837	2842234-504		SWITCH, PROGRAM GJR639PR
159868	1438352-203	*	* MASK, BASIC GJR751TR,	153892	2841813-505		SWITCH, TUNING GJR751TR,
			GJR684TR				GJR756HR, GJR759PR
159869	1438352-201	*	* MASK, BASIC GJR756HR	160295	2843301-003		TRIM GJR750T, GJR751TR
MK0079	1438352-214	*	* MASK, BASIC GJR641PR	157500	1468918-007		WINDOW, READOUT GJR639PR
157895	1438352-099	*	* MASK, BASIC GJR649PR	147985	2870602-001		WINDOW, READOUT GJC650T,
158613	1438352-088	*	* MASK, BASIC GJR683T				GJC654H, GJC654L, GJC658P,
158607	1438352-095	*	* MASK, BASIC GJR759PR				GJR683T
114918	990327-128		NUT, CONTROL MTG	153893	2871987-001		WINDOW, READOUT GJR751TR,
124338	1403390-405		NUT, SPEAKER MTG				GJR756HR, GJR759PR
148028	2870627-001		OVERLAY, CHAN/VOL GJR639PR	160304	1468918-009		WINDOW, READOUT GJR641PR,
157515	2840515-004		OVERLAY, LOGO GJC650T,				GJR649PR
			GJC654L, H, GJC658P	153243	1463773-506	*	* YOKE
158281	2840515-005		OVERLAY, LOGO GJR683T				
156336			PULL DECORATIVE GJR639PR,				
			GJR758P, GJR759PR				
155592			PULL DECORATIVE GJR649PR				
142415			PULL DECORATIVE GJC654H,				
			GJC658P				

*NOTE: BACK DRAWING NUMBER AT LOWER LEFT CORNER



FILE
1983
CTC 120
Addendum—1

Color Television Addendum Service Data

CTC 120 Series

RCA Corporation Consumer Electronics

Technical Publications

P.O. Box 1976 | Indianapolis, Indiana 46206

RCA Inc.

Technical Publications

5575 Royalmount Avenue | Town of Mount-Royal | Quebec, Canada H4P 1J8

Canada Stock Numbers:

Add prefix **64** to **Module** stock numbers.

Add prefix **70** to **Tuner** stock numbers.

Add prefix **62** to **all other** stock numbers.

Purpose of This Addendum: Additional information and updating of 1983 CTC 120 Basic Service Data to cover latest product design.

Filing Instructions: File this addendum immediately in front of 1983 CTC 120 Basic Service Data.

SUMMARY OF ADDITIONS/CHANGES COVERED BY THIS ADDENDUM

Original Service Data Contents	Page(s)	Additions/Changes In This Addendum	Page(s)
1. Alignment-Contrast Preset	58	Text Change	2
2. MSC 013 Schematic	39, 40	Value Changes and component changes applicable to late production	3
3. MSC 013 Circuit Board	41	Copper pattern and component changes applicable to late production	3
4. CRK 28 Circuit Board	55	Overlay and copper pattern was reversed	2
5. MCR 016 Circuit Board	53	Copper pattern and component changes applicable to late production	4
6. MCR 016 Circuit Board	53	Copper pattern and component change applicable to late production	4
7. Replacement Parts	75, 77	Parts list change applicable to late production	2

CHANGE IN CHASSIS ALIGNMENT

Contrast Preset (R704)

Preliminary—Connect Color generator to antenna input, set Contrast (Pix) control to maximum and pull kine socket to assure set is not in beam limiting. Connect oscilloscope to TP703 and short across LDR terminals.

Adjust Contrast Preset Control R704 to produce 3.3V Black to White signal (does not include blanking) at U700, pin 21 (TP703) with 100 IRE luminance input signal.

Remove short across LDR terminals.

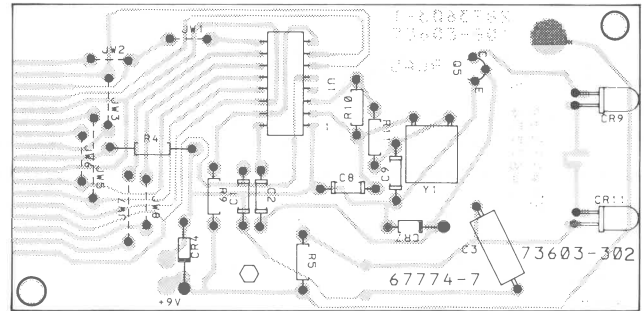


Fig. 1 — CRK28 PW1000 Circuit Board

BEFORE REPLACING PARTS, READ THE FOLLOWING:

RCA-Approved Substitute Stock Numbers—Before ordering stock numbers in this parts list, look for an RCA-approved substitute stock number in the current *RCA Distributor & Special Products Price Schedule*. This will minimize your service time and avoid ordering parts you already have in stock.

See your RCA Distributor for Replacement Parts and Accessories.

Warranty Status of Assemblies and Parts—The warranty status of some assemblies and parts are indicated by one of the following Warranty Status Codes:

- Complete assembly not eligible for warranty exchange or replacement.
- † Eligible for warranty exchange for new or rebuilt unit.
- ‡ Complete assembly eligible for warranty replacement with new or rebuilt unit.

All parts listed without a Warranty Status Code symbol are eligible for warranty replacement as discrete components.

Warranty replacement of cabinet parts requires prior approval of RCA.

Warranty Status and Specifications of assemblies and parts are subject to change without notice.

PRODUCT SAFETY NOTE—Components marked with a (★) have special characteristics important to safety. Before replacing any of these components, read carefully the **PRODUCT SAFETY NOTICE** in the Basic Service Data. Do not degrade the safety of the set through improper servicing. Although assemblies as a whole may not be marked with a (★), replacement of RCA assemblies with other assemblies not RCA approved may result in a safety hazard.

Canada Stock Numbers:

Add prefix **64** to **Module** stock numbers.
Add prefix **70** to **Tuner** stock numbers.
Add prefix **62** to **all other** stock numbers.

.....AVOID REPLACEMENT PART ERRORS.....

File supplements and addendums immediately upon receipt, and consult the parts lists in them before ordering parts.

NOTE: For complete coverage of all parts and assemblies used in instruments equipped with the chassis series to which this service data relates, consult the following publications:

● **Basic Service Data**—Chassis and tuning systems and most related parts and assemblies that do not differ from one model or model group to another.

● **Service Data Supplements**—Cabinet, auxiliary, and other parts and assemblies that differ from one model group to another.

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Do not replace or order parts without first consulting any Addendum(s) that may have been issued since publication of this service data.

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
------------	-----------	-------------	-------------

Under TUNER CONTROL ASSEMBLIES**MSC013RA**

MSC 013RA	149703	2841954-507	‡ MODULE COMPLETE
C2593	143897	1491407-90R	CAPCD 10002 25V 50V
C2594	143897	1491407-90R	CAPCD 10002 Z25V 50V
C2995	143897	1491407-90R	CAPCD 10002 Z25V 50V
C2596	143897	1401407-90R	CAPCD 10002 Z25V 50V

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
------------	-----------	-------------	-------------

Under REMOTE CONTROL ASSEMBLIES**MCR016RA**

MSC 016RA	149693	2840812-507	‡ MODULE COMPLETE
CR1141	141429	99201-218	DIODE ZENER 12V
Q1111	146847	1417306-013	TRANSISTOR-REGULATOR
Q1112	146847	1417306-013	TRANSISTOR-REGULATOR
Q1113	146847	1417306-013	TRANSISTOR-REGULATOR
R1152	831A68	2816777-345	RES MFPP 1W 5% 6.8R

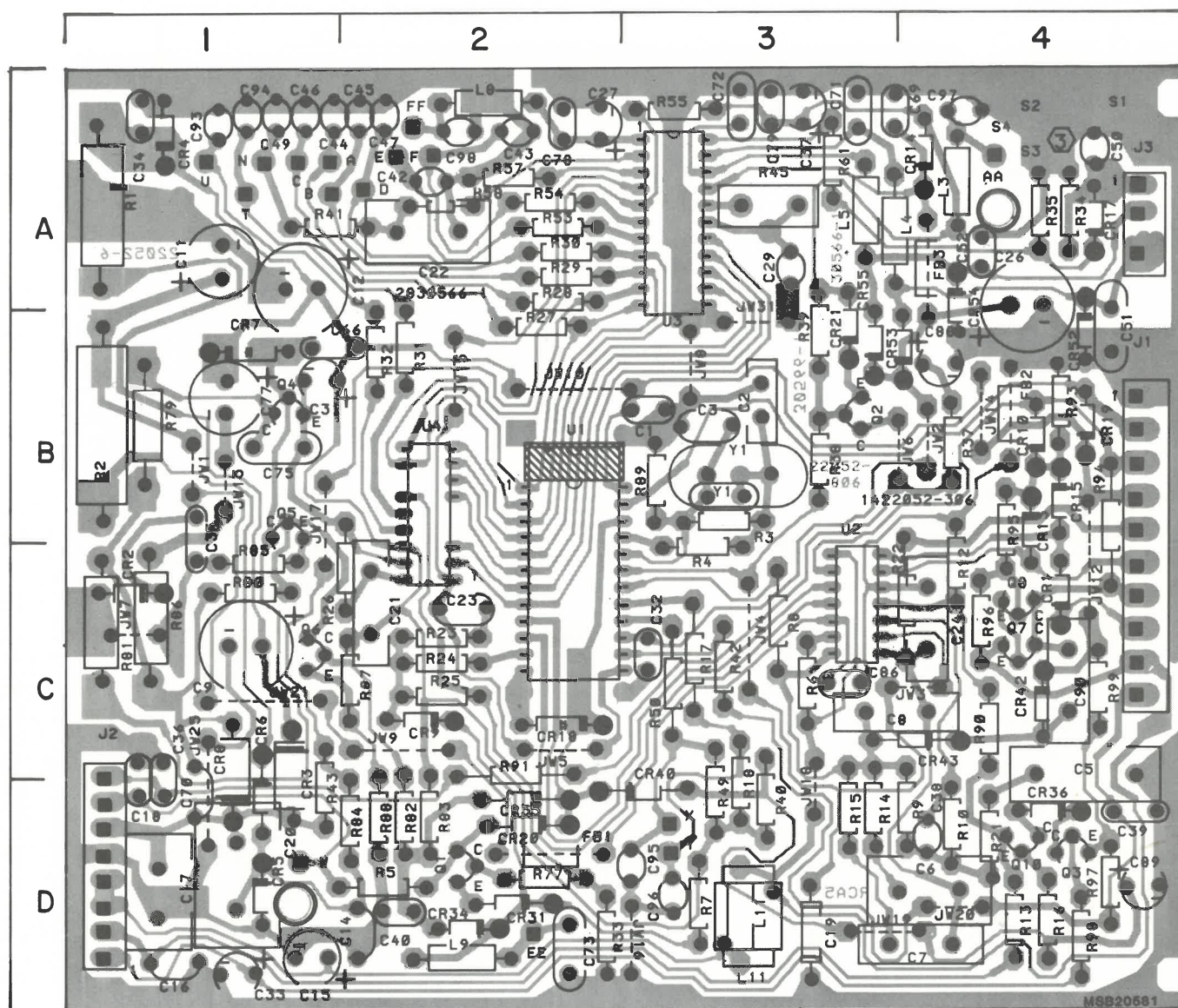
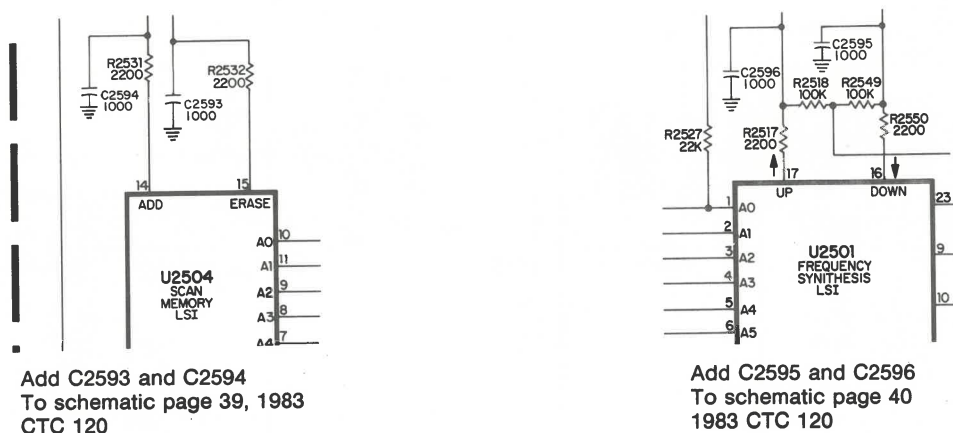


Fig. 2 - MSC 013RA Tuner Control Circuit Board Assembly (Late Production)



Change L2511 value on schematic (page 40) to read - 68 μ h - CTC 120

Change C2589 value on schematic (page 39) to read - 33 μ F - CTC 120

Fig. 3 - MSC 013RA Tuner Control Partial Schematic - Late Production

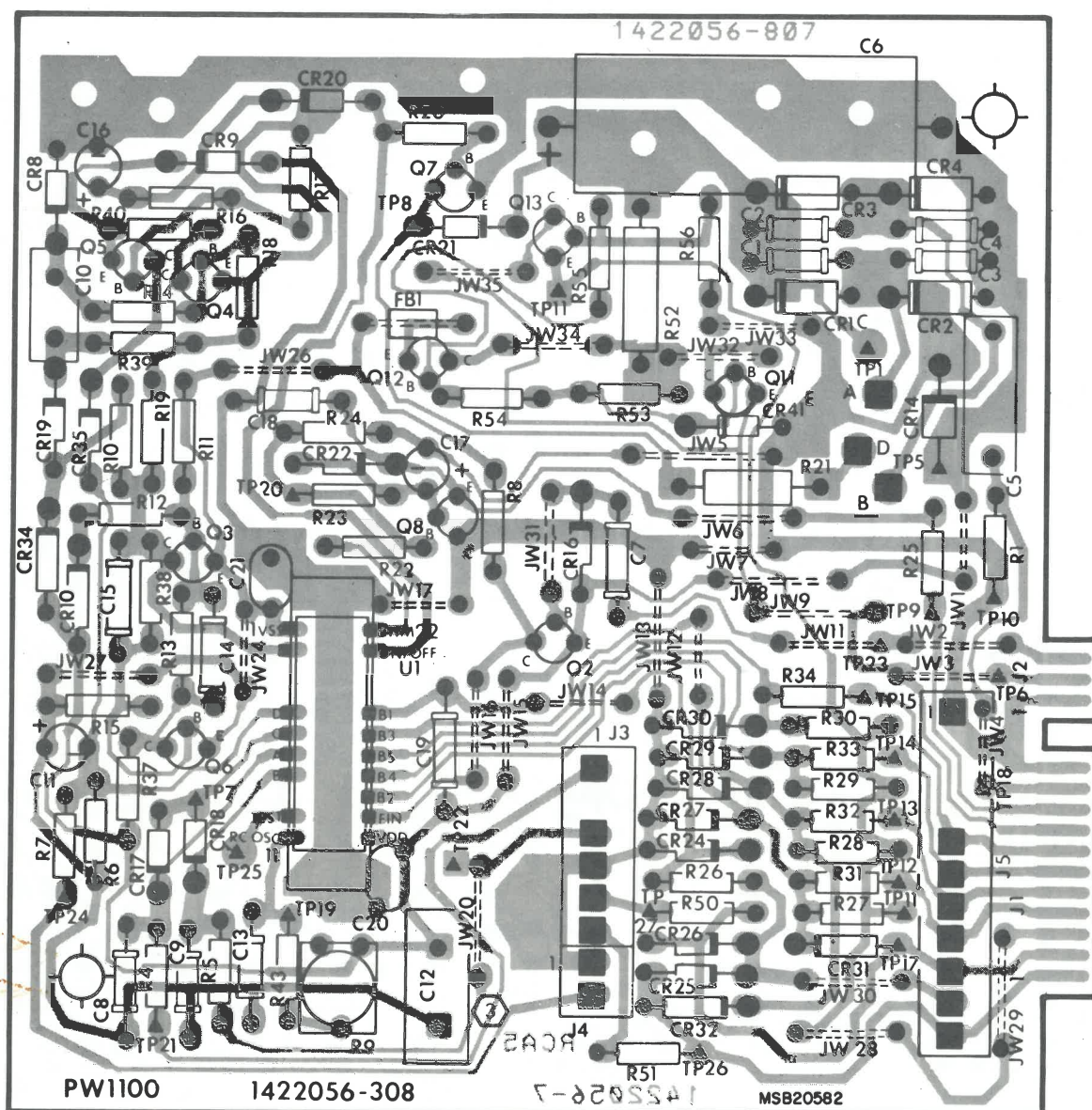


Fig. 4 — MCR016 Remote Circuit Board (Late Production)

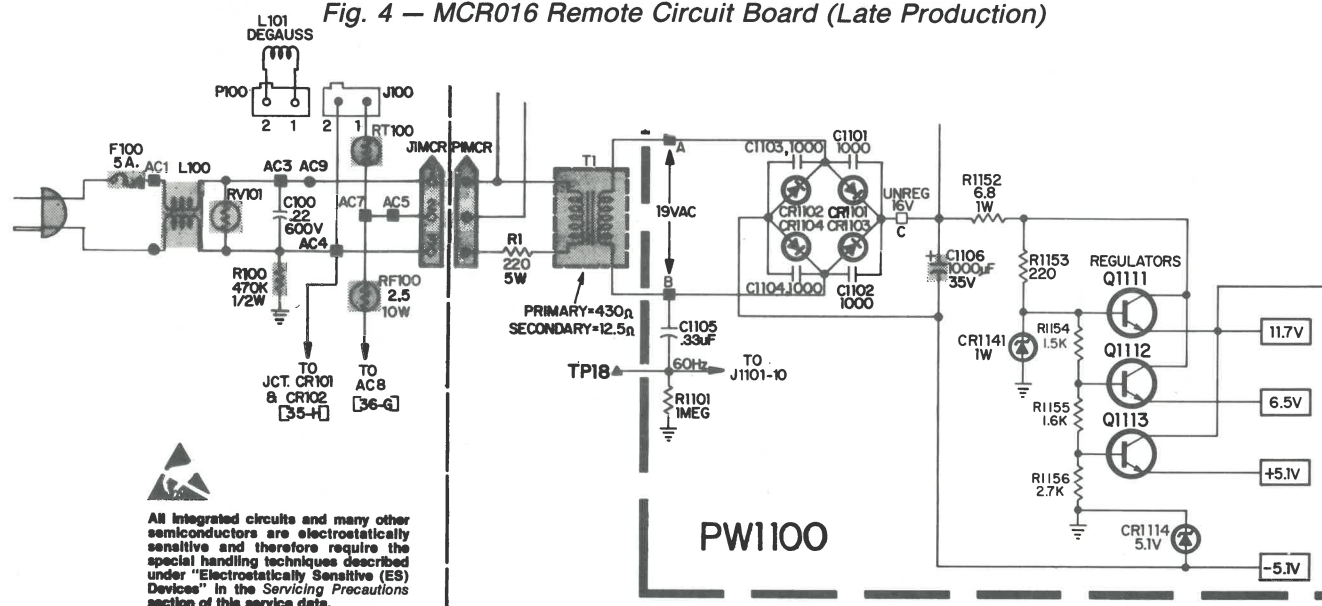


Fig. 5 — MCR016 Partial Remote Schematic (Late Production)



FILE
1983
CTC 120 — S1 (I)
RCASCO Addendum—1

Color Television Addendum Service Data

CTC 120 Series

RCA Corporation Consumer Electronics

Technical Publications
P.O. Box 1976 | Indianapolis, Indiana 46206

RCA Inc.

Technical Publications

5575 Royalmount Avenue | Town of Mount-Royal | Quebec, Canada H4P 1J8

Canada Stock Numbers:

Add prefix 64 to **Module** stock numbers.

Add prefix 70 to **Tuner** stock numbers.

Add prefix 62 to **all other** stock numbers.

Purpose of This Addendum: To add models and update file 1983 CTC 120—S1 (I).

Filing Instructions: File this addendum immediately in front of Service Data file 1983 CTC 120—S1 (I).

Model-To-Major Assembly Cross Reference

MODEL	CHASSIS	TUNER CONTROL	TUNERS UHF/VHF	RADIO	PICTURE TUBE
JJR 950E	CTC 120A	VTCA-7A	MST 010RA		★19VLNP22
JJR 955M	CTC 120A	VTCA-7A	MST 010RA	RC 3042	★19VLNP22

SUMMARY OF ADDITIONS/CHANGES COVERED BY THIS ADDENDUM

Original Service Data Contents	Page(s)	Additions/Changes In This Addendum	Page(s)
Model-to-Major Assembly Cross Reference	1	Model-to-Major Assembly Cross Reference	1
Replacement Parts	10,11,12	Replacement Parts	2

This is an **Addendum Service Data**. It covers model related information and any exceptions to the Basic and/or Supplement Service Data 1983 CTC 120 and 1983 CTC 120 — S1 (I)

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CTC 120 Series

REPLACEMENT PARTS

BEFORE REPLACING PARTS, READ THE FOLLOWING:

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Canada Stock Numbers:

Add prefix **64** to **Module** stock numbers.

Add prefix **70** to **Tuner** stock numbers.

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.....AVOID REPLACEMENT PART ERRORS.....

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Do not replace or order parts without first consulting any Addendum(s) that may have been issued since publication of this service data.

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
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CHASSIS ASSEMBLY

CTC120A

SAME AS CTC1120A PREVIOUSLY ISSUED IN 1983 CTC120

BASIC EXCEPT AS LISTED.

C118	161100	1449706-022	CAP POLY .033UF M 600V
C209	143555	2841262-011	CAPCD 2.5PF M NPO 250V
C213	146538	2841251-66A	CAPCD 18PF F NPO 50V
C318	146538	2841251-66A	CAPCD 18PF F NPO 50V
C321	146208	2840361-462	CAP LYTC 3.3UF N 50V
C403	143967	2841254-82M	CAPCD 4700PF R Z5P 50V
C406	160132	1447121-010	CAP PROP 8200PF K 200V
C413	150737	2841253-22M	CAPCD 270PF K Z5P 50V
C416	143881	2841253-42M	CAPCD 2200PF K Z5P 50V
C421	148057	2841253-92M	CAPCD 1000PF K Z5P 50V
C507	139440	1472442-059	CAP POLY 4700PF K 200V
L401	160969	2871333-009	COIL HORIZ FREQ
L701	159258	2872884-023	COIL 18UH
L702	159258	2872884-023	COIL 18UH
R314	829118	993218-679	RES CF 1/4W 2% 180R
R503	829530	993218-481	RES CF 1/4W 5% 3.3M
R518	830A10	2817720-325	★ RES CFFP 1/2W 5% 100R
T101	159346	2870941-007	TRANSFORMER REGULATOR
U701	152051	1465638-010	IC LUMA/CHROMA
	161101	2873812-001	CLIP, C105

CIRCUIT BOARDS

CHANNEL DISPLAY

C3	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C4	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
P3MSC	157354	2861604-303	CONNECTOR 4 PIN
P703	157612	2861659-001	★ CONNECTOR

KINE SOCKET ASSEMBLY

PW 5000	154444	1458854-510	‡ CIRCUIT COMPLETE
R5015	149818	1458853-509	★ RES FOCUS/SCREEN W/HOUSING

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
---------------	--------------	----------------	-------------

TUNING SYSTEM ASSEMBLY

TUNER ASSEMBLIES

MST010A

C46	142881	1479267-003	CAPCTRAP 82PF K 100V
C52	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C58	129977	1442718-008	CAPCD 470PF M Z5P 100V
C63	141868	1490304-162	CAP LYTC 1UF M 50V
C83	134430	1442718-007	CAPCD 1000PF G5V Z5U 100V
C84	125032	1442717-116	CAPCD 27PF GMV Z5U 100V
P4002	161060	2861608-006	CONNECTOR 8 PIN
Q6	154522	2816731-001	TRANSISTOR UHF IF BUFFER
R6	143788	993218-177	RES CF 1/4W 10% 2.2M
R8	151942	993218-750	RES CF 1/4W 2% 160K
R9	151944	993218-701	RES CF 1/4W 2% 1.5K
R10	151943	993218-687	RES CF 1/4W 2% 390K
R14	829447	1491384-761	RES CF 1/4W 2% 470K
R31	151941	993218-747	RES CF 1/4W 2% 120K
R32	151942	993218-750	RES CF 1/4W 2% 160K
R39	143788	993218-177	RES CF 1/4W 2% 2.2M
R24002	159622	2812886-007	★ RES CC 1/2W 10% 3.9M
R24003	159622	2812886-007	★ RES CC 1/2W 10% 3.9M
	159759	1477018-535	★ CABLE, COAXIAL
	158501	2843342-002	SPRING, BOTTOM COVER
	157459	1491192-002	SPRING, TOP COVER

TUNER CONTROL ASSEMBLY

VTCA7A

P302	157135	2861606-300	CONNECTOR 6 PIN
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INSTRUMENT ASSEMBLIES

JJR950E

JJR955M

SAME AS JJR950W & JJR955W PREVIOUSLY ISSUED FILE
1983 CTC120-S1 (I) EXCEPT AS LISTED

MK0115	2830356-040	★ MASK, CABINET FRONT JJR950E
MK0082	2830356-039	★ MASK, CABINET FRONT JJR955M



FILE
1983
CTC 120 — S2 (I)
Addendum 1
RCASCO

Color Television Supplement Service Data

CTC 120 Series

RCA Corporation Consumer Electronics

Technical Publications
P.O. Box 1976 | Indianapolis, Indiana 46206

RCA Inc.

Technical Publications
5575 Royalmount Avenue | Town of Mount-Royal | Quebec, Canada H4P 1J8

Canada Stock Numbers:
Add prefix **64** to **Module** stock numbers.
Add prefix **70** to **Tuner** stock numbers.
Add prefix **62** to **all other** stock numbers.

SAFETY NOTICE USE ISOLATION TRANSFORMER WHEN SERVICING

Components having special safety characteristics are identified by shading on schematics and by ★ stars on the parts list in this Service Data and its supplements and bulletins. Before servicing this chassis, it is important that the service technician read and follow the "Safety Precautions" and "Product Safety Notices" in this Service Data.

★ For continued x-radiation protection, replace picture tube with original type or RCA-approved equivalent type. If field replacement of picture tube is required, an ADJUSTABLE TYPE BEAM BENDER must be ordered and installed on the neck of the replacement picture tube. Consult parts list for correct stock number.

Model-To-Major Assembly Cross Reference

MODEL	CHASSIS	TUNER CONTROL	TUNER VHF/UHF	PICTURE TUBE	REMOTE
JJR 960TR	CTC 120A	MSC012RA	MST013RB	★19VLNP22	MCR021A/CRK33C

REPLACEMENT PARTS

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
---------------	--------------	----------------	-------------

INSTRUMENT ASSEMBLY

JJR960TR

JJR960TR SAME AS JJR960WR PREVIOUSLY ISSUED IN 1983
CTC120-S2 I EXCEPT AS LISTED.

MK0141 2830356-041 ★ MASK, CABINET FRONT

This is a Supplement Service Data. It covers model-related information and any exceptions to the Basic Service Data 1983 CTC 120

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CTC 120 Series



FILE
1983
CTC 120 — S3(I)
RCASCO Addendum — 2

Color Television Supplement Service Data

CTC 120 Series

RCA Corporation Consumer Electronics

Technical Publications
P.O. Box 1976 | Indianapolis, Indiana 46206

RCA Inc.

Technical Publications
5575 Royalmount Avenue | Town of Mount-Royal | Quebec, Canada H4P 1J8

Canada Stock Numbers:
Add prefix **64** to **Module** stock numbers.
Add prefix **70** to **Tuner** stock numbers.
Add prefix **62** to **all other** stock numbers.

Purpose of This Addendum: To add a model and update file 1983 CTC 120-S3(I).

Filing Instructions: File this addendum immediately in front of RCA Service Data 1983 CTC 120-S3(I).

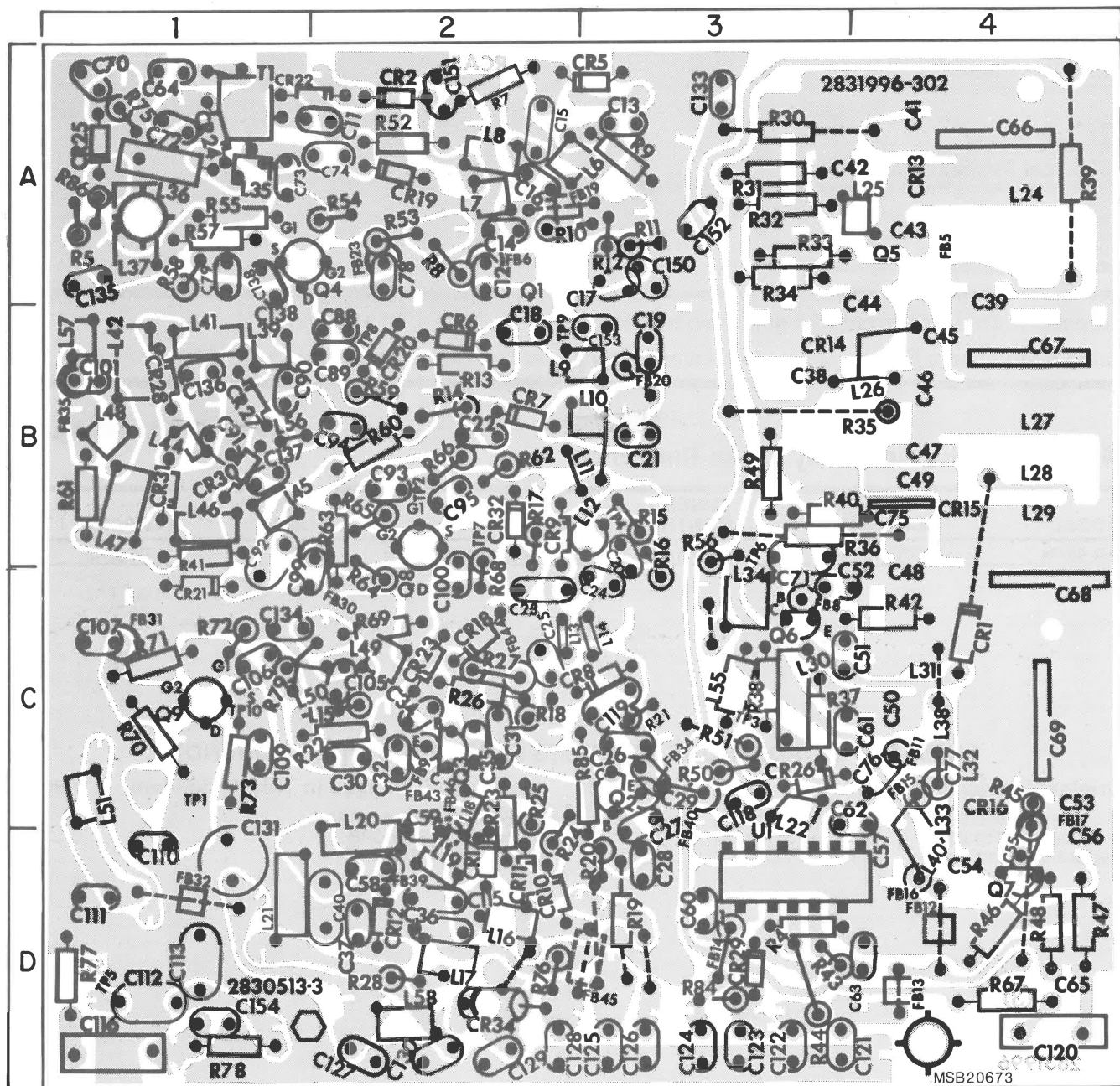
Model-To-Major Assembly Cross Reference

MODEL	CHASSIS	TUNER CONTROL	TUNER VHF/UHF	PICTURE TUBE	RADIO
JJR 967M	CTC 120A	MSC016RA	MST013RB	★19VLNP22	RC3042

SUMMARY OF ADDITIONS/CHANGES COVERED BY THIS ADDENDUM

Original Service Data Contents	Page(s)	Additions/Changes In This Addendum	Page(s)
Circuit Board MST013RB	—	Circuit Board MSC013RB	2
Schematic MST013RB	—	Schematic MSC013RB	3, 4, 5
Replacement Parts	10, 11, 12	Replacement Parts	6, 7

This is an Addendum Service Data. It covers model related information and any exceptions to the Basic and/or Supplement Service Data 1983 CTC 120 and 1983 CTC 120—S3(I)



Note: Add 24000 Series Prefix to Item Numbers

Fig. 1—MST 013RB Circuit Board Assembly (Late Production)

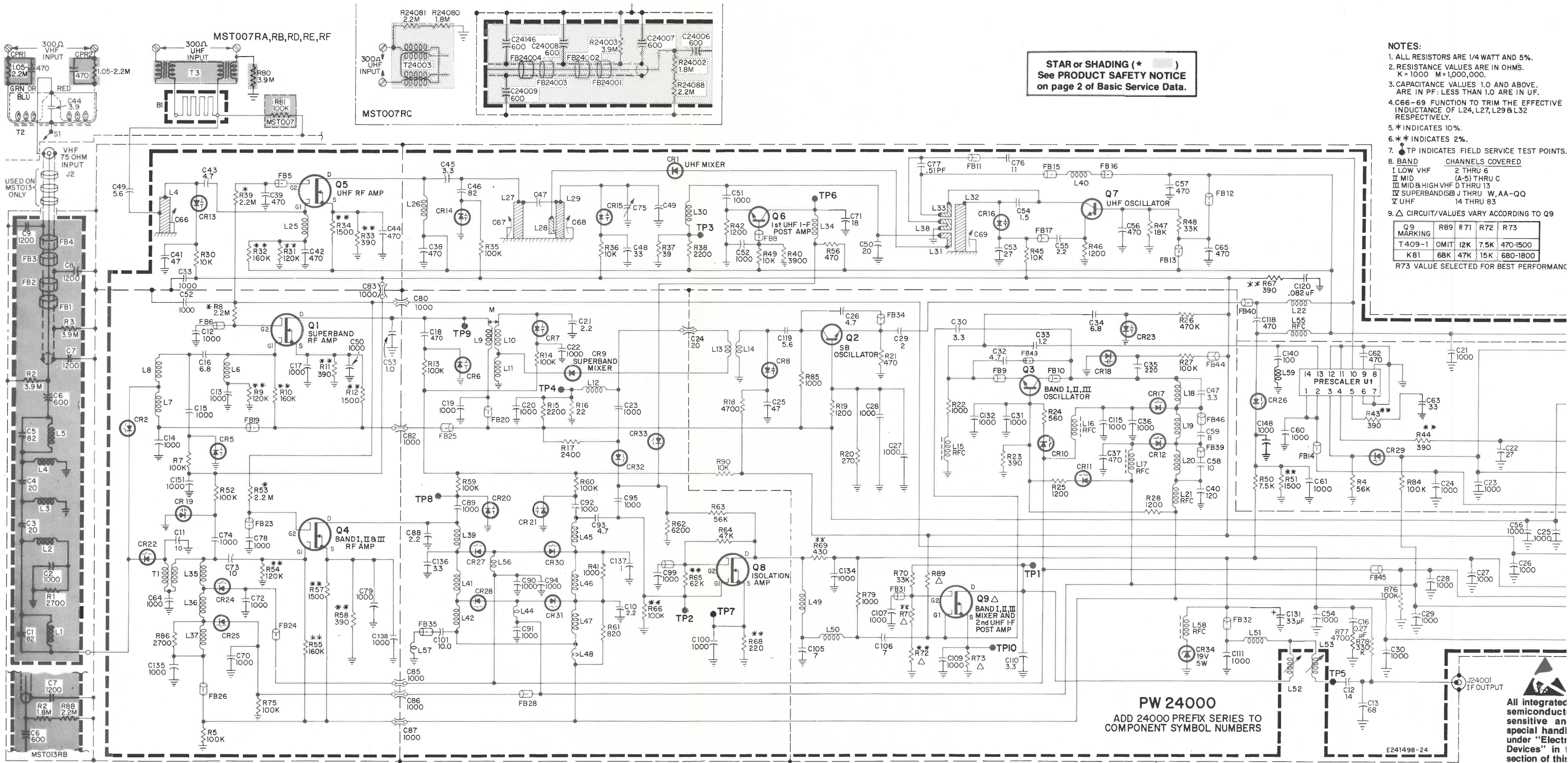



Fig. 2-MST 013RB Schematic Diagram (Late Production)

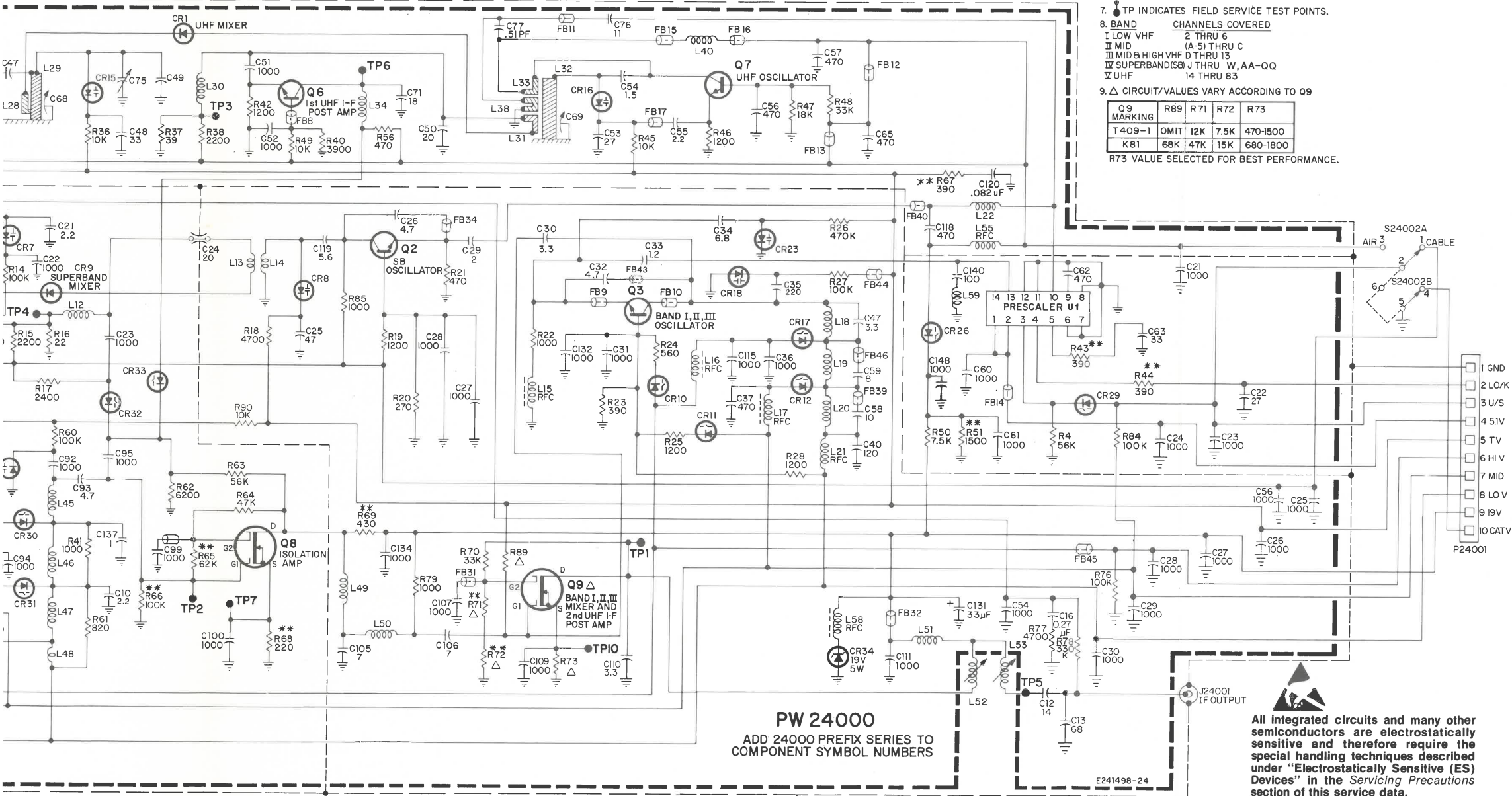


NOTES:

- 1. ALL RESISTORS ARE 1/4 WATT AND 5%.
- 2. RESISTANCE VALUES ARE IN OHMS.
K=1000 M=1,000,000.
- 3. CAPACITANCE VALUES 1.0 AND ABOVE.
ARE IN PF. LESS THAN 1.0 ARE IN UF.
- 4. C66-69 FUNCTION TO TRIM THE EFFECTIVE
INDUCTANCE OF L24, L27, L29 & L32
RESPECTIVELY.
- 5. * INDICATES 10%.
- 6. ** INDICATES 2%.
- 7.  TP INDICATES FIELD SERVICE TEST POINTS.
- 8. **BAND** **CHANNELS COVERED**
I LOW VHF 2 THRU 6
II MID (A-5) THRU C
III MID & HIGH VHF THRU 13
IV SUPERBAND(SB) J THRU U, W, AA-QQ
V UHF 14 THRU 83
- 9. **D CIRCUT/VALUES VARY ACCORDING TO Q9**

Q9 MARKING	R89	R71	R72	R73
T409-1	OMIT	12K	7.5K	470-1500
K81	68K	47K	15K	680-1800

R73 VALUE SELECTED FOR BEST PERFORMANCE



STAGE	ELEMENT	I	II	III	IV	V
Q1	D	—	—	—	18.5	—
	G2	10.3	10.3	10.3	10.3	10.3
	G1	—	—	—	7.8	—
	S	—	—	—	7.8	—
Q2	C	—	—	—	12.5	—
	B	—	—	—	3.3	—
	E	—	—	—	3.0	—
Q3	C	18.7	17.8	17.7	—	—
	B	4.4	6.7	8.8	—	—
	E	5.6	7.7	8.8	—	—
Q4	D	18.6	17.7	17.7	—	—
	G2	10.3	10.3	10.3	10.3	10.3
	G1	7.9	7.5	7.5	—	—
	S	8.0	7.7	7.7	—	—
Q5	D	—	—	—	—	18.6
	G2	10.3	10.3	10.3	10.3	10.3
	G1	—	—	—	—	7.9
	S	—	—	—	—	7.9
Q6	C	—	—	—	—	15.8
	B	—	—	—	—	5.1
	E	—	—	—	—	4.4
Q7	C	—	—	—	—	18.6
	B	—	—	—	—	5.2
	E	—	—	—	—	5.8
Q8	D	11.3	11.3	11.3	11.3	11.3
	G2	9.0	9.0	9.0	9.0	9.0
	G1	5.9	5.9	5.9	5.9	5.9
	S	5.3	5.3	5.3	5.3	5.3
Q9	D	18.6	18.5	18.5	18.6	18.5
	G2	13.9	13.9	13.8	13.8	13.9
	G1	6.6	6.7	6.6	6.6	6.6
	S	7.7	7.8	7.5	7.1	7.1
CR1	A	—	—	—	—	0.3
	K	—	—	—	—	—
CR9	A	—	—	—	0.2	—
	K	—	—	—	—	—

*All voltages are + DC.

Fig. 2—MST 013RB Schematic Diagram (Late Production)

REPLACEMENT PARTS

BEFORE REPLACING PARTS, READ THE FOLLOWING:

RCA-Approved Substitute Stock Numbers—Before ordering stock numbers in this parts list, look for an RCA-approved substitute stock number in the current *RCA Distributor & Special Products Price Schedule*. This will minimize your service time and avoid ordering parts you already have in stock.

See your RCA Distributor for Replacement Parts and Accessories.

Warranty Status of Assemblies and Parts—The warranty status of some assemblies and parts are indicated by one of the following Warranty Status Codes:

- Complete assembly not eligible for warranty exchange or replacement.
- † Eligible for warranty exchange for new or rebuilt unit.
- ‡ Complete assembly eligible for warranty replacement with new or rebuilt unit.

All parts listed without a Warranty Status Code symbol are eligible for warranty replacement as discrete components.

Warranty replacement of cabinet parts requires prior approval of RCA.

Warranty Status and Specifications of assemblies and parts are subject to change without notice.

PRODUCT SAFETY NOTE—Components marked with a (★) have special characteristics important to safety. Before replacing any of these components, read carefully the **PRODUCT SAFETY NOTICE** in the Basic Service Data. Do not degrade the safety of the set through improper servicing. Although assemblies as a whole may not be marked with a (★), replacement of RCA assemblies with other assemblies not RCA approved may result in a safety hazard.

Canada Stock Numbers:

Add prefix **64** to **Module** stock numbers.

Add prefix **70** to **Tuner** stock numbers.

Add prefix **62** to **all other** stock numbers.

● **Basic Service Data**—Chassis and tuning systems and most related parts and assemblies that do not differ from one model or model group to another.

● **Service Data Supplements**—Cabinet, auxiliary, and other parts and assemblies that differ from one model group to another.

● **Service Data Addendum**—Any parts additions, deletions, or other changes made after initial production.
Do not replace or order parts without first consulting any Addendum(s) that may have been issued since publication of this service data.

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
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CHASSIS ASSEMBLY

CTC120A

SAME AS CTC120 AS PREVIOUSLY ISSUED IN 1983 CTC120 BASIC EXCEPT AS LISTED.

C118	161100	1449706-022	CAP POLY .033UF M 600V
C209	143555	2841262-011	CAPCD 7.5PF M NPO 250V
C213	146538	2841251-66A	CAPCD 18PF F NPO 50V
C318	146538	2841251-66A	CAPCD 18PF F NPO 50V
C321	146208	2840361-462	CAP LYTC 3.3UF N 50V
C403	143967	2841254-82M	CAPCD 4700PF R Z5P 50V
C406	160132	1447121-010	CAP PROP 8200PF K 200V
C413	150737	2841253-22M	CAPCD 270PF K Z5P 50V
C416	143881	2841253-42M	CAPCD 2200PF K Z5P 50V
C421	148057	2841253-92M	CAPCD 1000PF K Z5P 50V
C507	139440	1472442-059	CAP POLY 4700PF K 200V

L401	160969	2871333-009	COIL HORIZ FREQ
L701	159258	2872884-023	COIL 18UH
L702	159258	2872884-023	COIL 18UH

R314	829118	993218-679	RES CF 1/4W 2% 180R
R503	829530	993218-481	RES CF 1/4W 5% 3.3M
R518	830A10	2817720-325	★ RES CFFP 1/2W 5% 100R

T101	159346	2870941-007	TRANSFORMER REGULATOR
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U701	152051	1465638-010	IC LUMA/CHROMA
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	161101	2873812-001	CLIP, C105
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CIRCUIT BOARDS

CHANNEL DISPLAY

C3	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V
C4	143879	1491407-90R	CAPCD 1000PF Z Z5V 50V

P3MSC	157354	2861604-303	CONNECTOR 4 PIN
P703	157612	2861659-001	★ CONNECTOR

KINE SOCKET ASSEMBLY

5000	154444	1458854-510	‡ CIRCUIT COMPLETE
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R5015	149818	1458853-509	★ RES FOCUS/SCREEN W/HOUSING
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REPLACEMENT PARTS

Replacement Parts Continued (See Product Safety Note on first page of this parts list)

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
C24051	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24052	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24053	142883	1479267-007	CAPCTRAP 20PF J N750 100V
C24054	142885	1479267-005	CAPCTRAP 1.5PF D 100V
C24055	129972	1442717-124	CAPCD 2.2PF C NPO 100V
C24056	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V
C24057	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V
C24058	119404	1442717-033	CAPCD 10PF J N470 100V
C24059	160072	1442717-171	CAPCD 8PF J NPO 100V
C24060	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24061	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24062	129977	1442718-008	CAPCD 470PF M Z5P 100V
C24063	133556	1442717-112	CAPCD 33PF K N750 100V
C24064	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24065	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V
C24070	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24071	103133	1490132-73A	CAPCD 18PF J NPO 250V
C24072	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24073	119404	1442717-133	CAPCD 10PF J N470 100V
C24074	161335	1442718-009	CAPCD 150PF K Z5P 100V
C24076	125034	1442717-018	CAPCD 11PF J N470 100V
C24077	119584	942454-068	CAPHL .51PF K Z5C 500V
C24078	134430	1442718-001	CAPCD 1000PF GMV Z5U 100V
C24079	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24080	116896	1442616-002	CAPCFT 1000PF P Z5U 300V
C24082	116896	1442616-002	CAPCFT 1000PF P Z5U 300V
C24083	116896	1442616-002	CAPCFT 1000PF P Z5U 300V
C24085	116896	1442616-002	CAPCFT 1000PF P Z5U 300V
C24086	116896	1442616-002	CAPCFT 1000PF P Z5U 300V
C24087	116896	1442616-002	CAPCFT 1000PF P Z5U 300V
C24088	129972	1442717-110	CAPCD 2.2PF C NPO 100V
C24089	161335	1442718-009	CAPCD 150PF K Z5P 100V
C24090	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24091	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24092	143027	1491123-001	CAPCD 82PF J N1500 250V
C24093	119406	1442717-106	CAPCD 4.7PF C NPO 100V
C24094	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24095	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24099	134430	1442718-001	CAPCD 1000PF GMV Z5U 100V
C24100	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24101	119404	1442717-133	CAPCD 10PF J N470 100V
C24105	103523	1442717-159	CAPCD 7PF J N330 100V
C24106	103523	1442717-159	CAPCD 7PF J N330 100V
C24107	134430	1442718-001	CAPCD 1000PF GMV Z5U 100V
C24109	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24110	159757	1442717-101	CAPCD 3.3PF C NPO 100V
C24111	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24112	133853	942965-240	CAPCD 14PF D NPO 500V
C24113	145676	1491406-43A	CAPCD 68PF J NPO 50V
C24115	120832	945354-019	CAPCD 1000PF K Z5P 100V
C24116	142887	1490529-002	CAP POLY .27UF K 100V
C24118	129977	1442718-008	CAPCD 470PF M Z5P 100V
C24119	159756	1442717-131	CAPCD 5.6PF C N150 100V
C24120	143689	1490529-009	CAP POLY .082UF K 100V
C24121	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24122	125032	1442717-116	CAPCD 27PF J N750 100V
C24123	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24124	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24125	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24126	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24127	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24128	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24129	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24130	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24131	143688	1490001-010	CAP LYTC 33UF R 25V
C24133	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24134	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24135	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24136	134437	1442717-140	CAPCD 1PF C NPO 100V
C24137	134437	1442717-140	CAPCD 1PF C NPO 100V
C24138	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24147	159757	1442717-101	CAPCD 3.3PF C NPO 100V
C24148	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24149	139181	1442717-027	CAPCD 5.6PF C NPO 100V
C24150	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24151	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24152	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24153	134437	1442717-140	CAPCD 1PF C NPO 100V
C24154	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V

CR24001	119662	1471922-001	DIODE
CR24002	129095	1477022-002	DIODE

THRU			
CR24005			
CR24008	159588	2815555-002	DIODE MATCHED SET
CR24009	119662	1471922-001	DIODE
CR24010	119597	1471872-006	DIODE
CR24011	119597	1471872-006	DIODE
CR24012	129095	1477022-002	DIODE
CR24013			
THRU			

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
CR24016	137780	1477949-004	DIODE MATCHED SET
CR24017	129095	1477022-002	DIODE
CR24018			
THRU			
CR24021	147943	2812833-001	DIODE MATCHED SET
CR24022	129095	1477022-002	DIODE
CR24023	147943	2812833-001	DIODE
CR24024	129095	1477022-002	DIODE
CR24025	129095	1477022-002	DIODE
CR24026	129095	1477022-002	DIODE
CR24027	129095	1477022-002	DIODE
CR24028	129095	1477022-002	DIODE
CR24029	119597	1471872-006	DIODE
CR24030	129095	1477022-002	DIODE
CR24031	129095	1477022-002	DIODE
CR24032	129095	1477022-002	DIODE
CR24033	129095	1477022-002	DIODE
CR24034	143690	1477046-014	DIODE ZENER 19V
FB24001	150725	1443391-019	BEAD
FB24002	150725	1443391-019	BEAD
FB24003	150725	1443391-019	BEAD
FB24004	150725	1443391-019	BEAD
FB24005	152124	2843117-003	BEAD
FB24006	152103	2843117-002	BEAD
FB24008	152103	2843117-002	BEAD
FB24009	152103	2843117-002	BEAD
FB24011	152102	2843117-001	BEAD
FB24012	152103	2843117-002	BEAD
FB24013	152103	2843117-002	BEAD
FB24014	152103	2843117-002	BEAD
FB24015	152103	2843117-002	BEAD
FB24016	152102	2843117-001	BEAD
FB24017	152124	2843117-003	BEAD
FB24019	152103	2843117-002	BEAD
FB24020	152103	2843117-002	BEAD
FB24023	152103	2843117-002	BEAD
FB24024	152102	2843117-001	BEAD
FB24025	152103	2843117-002	BEAD
FB24026	152102	2843117-001	BEAD
FB24028	152102	2843117-001	BEAD
FB24030	152103	2843117-002	BEAD
FB24031	152103	2843117-002	BEAD
FB24032	152103	2843117-002	BEAD
FB24034	152124	2843117-003	BEAD
FB24035	152124	2843117-003	BEAD
FB24039	152124	2843117-003	BEAD
FB24040	152124	2843117-003	BEAD
FB24044	152102	2843117-001	BEAD
FB24045	152102	2843117-001	BEAD
FB24046	152124	2843117-003	BEAD

J24001	131222	1496154-001	CONNECTOR 1 PIN
L24015	119412	1442642-022	COIL 10UH
L24016	153393	2843295-001	COIL 12UH
L24017	153393	2843295-001	COIL 12UH
L24021	119412	1442642-022	COIL 10UH
L24052	150715	973969-033	COIL 1.8UH
L24053	150714	973969-032	COIL .97UH
L24055	153393	2843295-001	COIL 12UH
L24058	153393	2843295-001	COIL 12UH

Q24001	146521	2811975-001	TRANSISTOR SUPERBAND IF AMP
Q24002	141370	1417377-003	TRANSISTOR SUPERBAND OSCILLATOR
Q24003	141370	1417377-003	TRANSISTOR OSCILLATOR
Q24004	148085	2814681-001	TRANSISTOR RF AMP
Q24005	146521	2811975-001	TRANSISTOR UHF RF AMP
Q24006	151693	1417392-001	TRANSISTOR 1ST UHF RF AMP
Q24007	151326	1417360-001	TRANSISTOR UHF OSCILLATOR
Q24008	148085	2814681-001	TRANSISTOR ISOLATION AM
Q24009	152500	2815513-001	TRANSISTOR MIXER/UHF AMP

bl are eligible for war-
approval of RCA.
d parts are subject to

th a (★) have special
any of these compo-
in the Basic Service
improper servicing.
th a (★), replacement
proved may result in a

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model group to

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other.
ations, or other

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of this service

RIPTION

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LETE

GMV Z5U 100V
V1500 250V
GMV Z5U 100V
N750 100V
N750 100V
V1500 250V
I Z5U 1.4KV
Z5U 1.4KV
Z5U 1.4KV
Z5U 1.4KV
V470 100V
GMV Z5U 100V
GMV Z5U 100V
GMV Z5U 100V
Z5P 100V
N150 100V
GMV Z5U 100V
V1500 250V
GMV Z5U 100V
GMV Z5U 100V
NPO 100V
GMV Z5U 100V
N750 100V
V750 100V
NPO 100V
K Z5P 100V
K Z5P 100V
NPO 100V
N470 100V
K Z5P 100V
N470 100V
Z5C 500V
V750 100V
NPO 50V
K Z5P 100V
I Z5P 100V
P N Z5P 100V
P N Z5P 100V
N750 250V
= J N750 100V
P N Z5P 100V
F D NPO 100V
P N Z5P 100V
F D P100 100V
= K N4000 100V
= J N750 100V
= J N750 100V

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1983 CTC 120—S3(I) Add. 2 REPLACEMENT PARTS

REPLACEMENT PARTS

Replacement Parts Continued (See Product Safety Note on first page of this parts list)

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
C24051	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24052	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24053	142883	1479267-007	CAPCTRAP 20PF J N750 100V
C24054	142885	1479267-005	CAPCTRAP 1.5PF D 100V
C24055	129972	1442717-124	CAPCD 2.2PF C NPO 100V
C24056	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V
C24057	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V
C24058	119404	1442717-033	CAPCD 10PF J N470 100V
C24059	160072	1442717-171	CAPCD 8PF J NPO 100V
C24060	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24061	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24062	129977	1442718-008	CAPCD 470PF M Z5P 100V
C24063	133556	1442717-112	CAPCD 33PF K N750 100V
C24064	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24065	142877	1479267-001	CAPCTRAP 470PF N Z5P 100V
C24070	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24071	103133	1490132-73A	CAPCD 18PF J NPO 250V
C24072	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24073	119404	1442717-133	CAPCD 10PF J N470 100V
C24074	161335	1442718-009	CAPCD 150PF K Z5P 100V
C24076	125034	1442717-018	CAPCD 11PF J N470 100V
C24077	119584	942454-068	CAPHL .51PF K Z5C 500V
C24078	134430	1442718-001	CAPCD 1000PF GMV Z5U 100V
C24079	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24080	116896	1442616-002	CAPCFT 1000PF P Z5U 300V
C24082	116896	1442616-002	CAPCFT 1000PF P Z5U 300V
C24083	116896	1442616-002	CAPCFT 1000PF P Z5U 300V
C24085	116896	1442616-002	CAPCFT 1000PF P Z5U 300V
C24086	116896	1442616-002	CAPCFT 1000PF P Z5U 300V
C24087	116896	1442616-002	CAPCFT 1000PF P Z5U 300V
C24088	129972	1442717-110	CAPCD 2.2PF C NPO 100V
C24089	161335	1442718-009	CAPCD 150PF K Z5P 100V
C24090	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24091	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24092	143027	1491123-001	CAPCD 82PF J N1500 250V
C24093	119406	1442717-106	CAPCD 4.7PF C NPO 100V
C24094	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24095	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24099	134430	1442718-001	CAPCD 1000PF GMV Z5U 100V
C24100	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24101	119404	1442717-133	CAPCD 10PF J N470 100V
C24105	103523	1442717-159	CAPCD 7PF J N330 100V
C24106	103523	1442717-159	CAPCD 7PF J N330 100V
C24107	134430	1442718-001	CAPCD 1000PF GMV Z5U 100V
C24109	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24110	159757	1442717-101	CAPCD 3.3PF C NPO 100V
C24111	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24112	133853	942965-240	CAPCD 14PF D NPO 500V
C24113	145676	1491406-43A	CAPCD 68PF J NPO 50V
C24115	120832	945354-019	CAPCD 1000PF K Z5P 100V
C24116	142887	1490529-002	CAP POLY .27UF K 100V
C24118	129977	1442718-008	CAPCD 470PF M Z5P 100V
C24119	159756	1442717-131	CAPCD 5.6PF C N150 100V
C24120	143689	1490529-009	CAP POLY .082UF K 100V
C24121	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24122	125032	1442717-116	CAPCD 27PF J N750 100V
C24123	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24124	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24125	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24126	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24127	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24128	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24129	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24130	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24131	143688	1490001-010	CAP LYTC 33UF R 25V
C24133	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24134	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24135	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24136	134437	1442717-140	CAPCD 1PF C NPO 100V
C24137	134437	1442717-140	CAPCD 1PF C NPO 100V
C24138	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24147	159757	1442717-101	CAPCD 3.3PF C NPO 100V
C24148	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24149	139181	1442717-027	CAPCD 5.6PF C NPO 100V
C24150	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24151	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24152	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
C24153	134437	1442717-140	CAPCD 1PF C NPO 100V
C24154	134430	1442718-007	CAPCD 1000PF GMV Z5U 100V
CR24001	119662	1471922-001	DIODE
CR24002	129095	1477022-002	DIODE
CR24005			THRU
CR24008	159588	2815555-002	DIODE MATCHED SET
CR24009	119662	1471922-001	DIODE
CR24010	119597	1471872-006	DIODE
CR24011	119597	1471872-006	DIODE
CR24012	129095	1477022-002	DIODE
CR24013			THRU

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
CR24016	137780	1477949-004	DIODE MATCHED SET
CR24017	129095	1477022-002	DIODE
CR24018			THRU
CR24021	147943	2812833-001	DIODE MATCHED SET
CR24022	129095	1477022-002	DIODE
CR24023	147943	2812833-001	DIODE
CR24024	129095	1477022-002	DIODE
CR24025	129095	1477022-002	DIODE
CR24026	129095	1477022-002	DIODE
CR24027	129095	1477022-002	DIODE
CR24028	129095	1477022-002	DIODE
CR24029	119597	1471872-006	DIODE
CR24030	129095	1477022-002	DIODE
CR24031	129095	1477022-002	DIODE
CR24032	129095	1477022-002	DIODE
CR24033	129095	1477022-002	DIODE
CR24034	143690	1477046-014	DIODE ZENER 19V
FB24001	150725	1443391-019	BEAD
FB24002	150725	1443391-019	BEAD
FB24003	150725	1443391-019	BEAD
FB24004	150725	1443391-019	BEAD
FB24005	152124	2843117-003	BEAD
FB24006	152103	2843117-002	BEAD
FB24008	152103	2843117-002	BEAD
FB24009	152103	2843117-002	BEAD
FB24011	152102	2843117-001	BEAD
FB24012	152103	2843117-002	BEAD
FB24013	152103	2843117-002	BEAD
FB24014	152103	2843117-002	BEAD
FB24015	152103	2843117-002	BEAD
FB24016	152102	2843117-001	BEAD
FB24017	152124	2843117-003	BEAD
FB24019	152103	2843117-002	BEAD
FB24020	152103	2843117-002	BEAD
FB24023	152103	2843117-002	BEAD
FB24024	152102	2843117-001	BEAD
FB24025	152103	2843117-002	BEAD
FB24026	152102	2843117-001	BEAD
FB24028	152102	2843117-001	BEAD
FB24030	152103	2843117-002	BEAD
FB24031	152103	2843117-002	BEAD
FB24032	152103	2843117-002	BEAD
FB24034	152124	2843117-003	BEAD
FB24035	152124	2843117-003	BEAD
FB24039	152124	2843117-003	BEAD
FB24040	152124	2843117-003	BEAD
FB24044	152102	2843117-001	BEAD
FB24045	152102	2843117-001	BEAD
FB24046	152124	2843117-003	BEAD
J24001	131222	1496154-001	CONNECTOR 1 PIN
L24015	119412	1442642-022	COIL 10UH
L24016	153393	2843295-001	COIL 12UH
L24017	153393	2843295-001	COIL 12UH
L24021	119412	1442642-022	COIL 10UH
L24052	150715	973969-033	COIL 1.8UH
L24053	150714	973969-032	COIL .97UH
L24055	153393	2843295-001	COIL 12UH
L24058	153393	2843295-001	COIL 12UH
Q24001	146521	2811975-001	TRANSISTOR SUPERBAND IF AMP
Q24002	141370	1417377-003	TRANSISTOR SUPERBAND OSCILLATOR
Q24003	141370	1417377-003	TRANSISTOR OSCILLATOR
Q24004	148085	2814681-001	TRANSISTOR RF AMP
Q24005	146521	2811975-001	TRANSISTOR UHF RF AMP
Q24006	151693	1417392-001	TRANSISTOR 1ST UHF RF AMP
Q24007	151326	1417360-001	TRANSISTOR UHF OSCILLATOR
Q24008	148085	2814681-001	TRANSISTOR ISOLATION AM
Q24009	152500	2815513-001	TRANSISTOR MIXER/UHF AMP
R24002	157839	2812886-012	★ RES CC 1/2W 10% 1.8M
R24003	159662	2812886-007	★ RESCC 1/2W 10% 3.9M
R24008	829522	993218-177	RES CF 1/4W 10% 2.2M
R24009	829412	993230-747	RES CF 1/4W 2% 120K
R24010	829416	993218-750	RES CF 1/4W 2% 160K
R24011	829139	993218-687	RES CF 1/4W 2% 390R
R24012	829215	993218-701	RES CF 1/4W 2% 1.5K
R24031	829412	993218-747	RES CF 1/4W 2% 120K
R24032	829416	993218-750	RES CF 1/4W 2% 160K
R24033	829139	993230-687	RES CF 1/4W 2% 390R
R24034	829215	993230-701	RES CF 1/4W 2% 1.5K
R24039	829522	993218-177	RES CF 1/4W 10% 2.2M
R24043	829139	993218-687	RES CF 1/4W 2% 390R
R24044	829139	993218-687	RES CF 1/4W 2% 390R
R24051	829215	993218-701	RES CF 1/4W 2% 1.5K
R24053	829522	993218-177	RES CF 1/4W 10% 2.2M
R24054	829412	993218-747	RES CF 1/4W 2% 120K

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1983 CTC 120—S3(I) Add. 2 REPLACEMENT PARTS

REPLACEMENT PARTS

Replacement Parts Continued (See Product Safety Note on first page of this parts list)

SYMBOL NO.	STOCK NO.	DRAWING NO.	DESCRIPTION
R24055	829416	993230-750	RES CF 1/4W 2% 160K
R24057	829215	993230-701	RES CF 1/4W 2% 1.5K
R24058	829139	993218-687	RES CF 1/4W 2% 390R
R24065	829362	993218-740	RES CF 1/4W 2% 62K
R24066	829410	993218-745	RES CF 1/4W 2% 100K
R24067	829139	993218-687	RES CF 1/4W 2% 390R
R24068	829122	993218-681	RES CF 1/4W 2% 220R
R24069	829143	993230-688	RES CF 1/4W 2% 430R
R24070	829333	993218-733	RES CF 1/4W 2% 33K
R24076	152335	993218-445	RES CF 1/4W 5% 100K
R24078	829433	993230-757	RES CF 1/4W 2% 330K
R24081	157949	2812886-010	★ RES CC 1/2W 10% 100K
R24088	157838	2812886-013	★ RES CC 1/2W 10% 2.2M
S24002	157950	2870945-502	SWITCH
T24001	151544	2871391-001	TRANSFORMER
U24001	143696	1421713-002	IC PRE SCALER
	157139	1477018-539	★ CABLE, COAXIAL
	157951	2830509-002	COVER, OUTER
	157147	2841830-004	SPRING, BOTTOM COVER
	157145	2841830-005	SPRING, BOTTOM 'Z'
	157146	2841829-001	SPRING, LARGE V
	157148	2871399-002	SPRING, TOP