

RCC TELEVISION RADIO SERVICE MANUAL HI-FI

1969
NUMBER
107

PUBLISHED BY RADIO COLLEGE OF CANADA, TORONTO

Mr. Ayres

ADMIRAL

COLOR TV

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H10-6X Other data see H10-4X in Supp. #94.	

Model

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TNR2931H See H10-6X & 4C4X.

B & W TV

The following models use chassis G7-6X, U
in Supp. #84:

23C321	23LU351	23L391
23CU321	23L361	23ST321
23L331	23LU361	23STU321
23LU331	23L371	739L11
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RADIO

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COLOR TV

Model

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C1521R See M701 in Supp. #97.
C2514R See M704 in Supp. #99.

B & W TV

Model

12-01R See M685 in Supp. #82.
M1622R See M685 in Supp. #82.
M1910S See M687 in Supp. #90.
M2112R See M687 in Supp. #90.
M2322B See M664 in TV Supp. #73.
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COLOR TV

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B & W TV

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COLOR TV

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14117
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14125
14135
14145
14155
14165

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B & W TV

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RADIO

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ZENITH

COLOR TV

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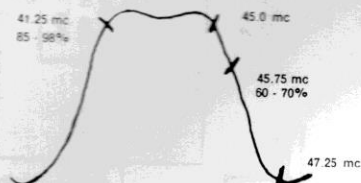
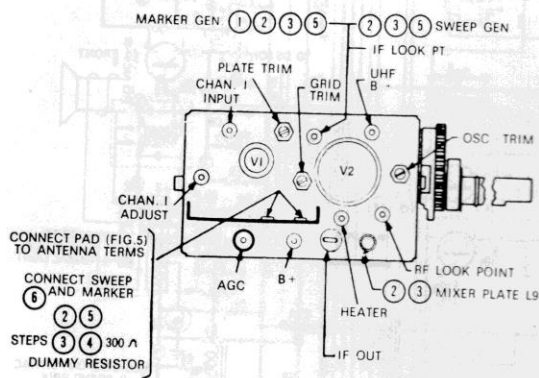
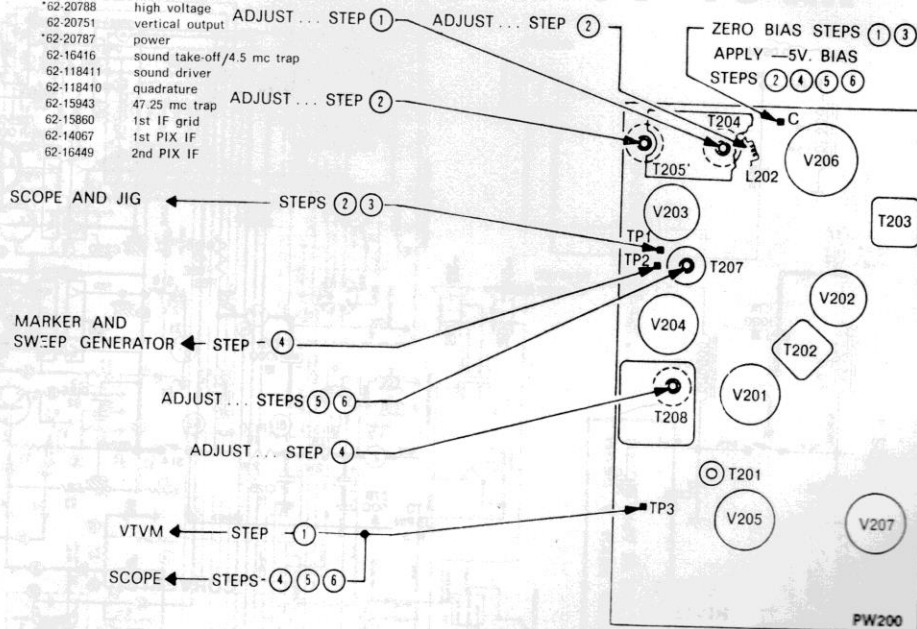
PICTURE IF ALIGNMENT DRAWING

T101
T102
T103
T104
T201
T202
T204
T205
T207
T208

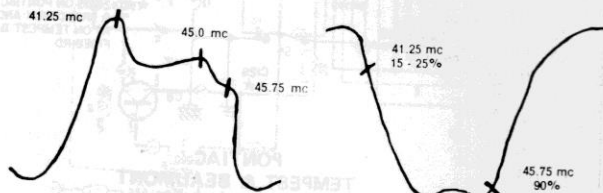
62-19485
*62-20788
62-20751
*62-20787
62-16416
62-118411
62-118410
62-15943
62-15860
62-14067
62-16449

TRANSFORMERS

audio output
high voltage
vertical output
power
sound take-off/4.5 mc trap
sound driver
quadrature
47.25 mc trap
1st IF grid
1st PIX IF
2nd PIX IF

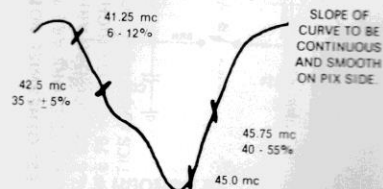


RESPONSE "A"



RESPONSE "B"

RESPONSE "C"



RESPONSE "D"

TRAP ADJUSTMENTS

TEST EQUIPMENT CONNECTIONS :

BIAS SUPPLYIn step 1 use zero bias to IF AGC terminal "C" during trap adjustment.

MARKER GENERATORConnect to IF injection point on tuner (IF-L.P.) in series with a 1500 pf. capacitor.

VTVMConnect direct probe to TP3 of PW200.

STEP	ADJUST	SWEEP GENERATOR	MARKER GENERATOR	ADJUST	REMARKS
1	Adjust 47.25 mc Trap	NOT USED	47.25 mc	T204	Adjust T204 for minimum deflection.

PICTURE IF SWEEP ALIGNMENT

TEST EQUIPMENT CONNECTIONS :

BIAS SUPPLY—5 volts to terminal "C" of PW200 and — 2.5 volts to terminal "AK" of PW200.

OSCILLOSCOPEConnect to TP1 of PW200 through a 180 ohm detector jig

MARKER GENERATORLightly couple to sweep generator cable.

SWEEP GENERATORConnect to test point (IF-L.P.) of VHF tuner in series with pad

MISCELLANEOUSConnect a 300 ohm carbon resistor as a dummy load across the antenna terminals.
Refer to illustration for all adjustment locations and responses. Channel selector to 9.

STEP	ADJUST	SWEEP GENERATOR	MARKER GENERATOR	ADJUST	REMARKS
2	Adjust Mixer Plate Coil and 1st IF Grid Transformer	40-50 mc	41.25 mc 45.0 mc 45.75 mc 47.25 mc	L9 T205	Adjust for maximum gain and response curve "A" Spiking L202 determines bandwidth.

Repeat steps 1 and 2. Reduce bias to zero at terminal "C" of PW200.

3	Adjust Mixer Plate Coil	40-50 mc	41.25 mc 45.0 mc 45.75 mc	L9	Touch up L9 until the 45.0 mc marker falls on peak as per response curve "B".
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Remove the 180 ohm test jig and connect oscilloscope to TP3 of PW200 through a 10K ohm resistor. Calibrate to 5 volts peak to peak. Connect the sweep generator to TP2 of PW200. Set bias to — 5 volts at terminals "C" of PW200.

4	Adjust 2nd Picture IF Plate Transformer	40-50 mc	41.25 mc 45.75 mc	T208 (Top & Bottom Cores)	Adjust for maximum gain and response curve "C". Adjust cores on outside peaks.
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Retain the — 5 volts at terminal "C" of PW200. Sweep generator to RF tuner mixer grid (IF-L.P.) in series with pad

5	Check IF Overall	40-50 mc	41.25 mc 42.5 mc 45.0 mc 45.75 mc	T207	Adjust T207 to maintain response "D".
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Disconnect IF sweep from RF tuner mixer grid. Remove dummy antenna load. Connect the sweep generator to the antenna terminals through an attenuator pad The marker generator coupled loosely to sweep generator cable. Retain the — 5 volts bias. Adjust the fine tuning to correct oscillator frequency for channel 9 using zero beat method.

6	Check RF/IF Overall	40-50 mc	41.25 mc 42.5 mc 45.0 mc 45.75 mc	T207	Make slight adjustments only . Observe response "D".
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Switch through all remaining channels to ensure overall response stays within limits shown in response "D".

— Channels Layout.

VHF TUNER RF ALIGNMENT

TEST EQUIPMENT CONNECTIONS:

BIAS SUPPLY	Apply —2 volts to tuner AGC terminal. Ground the positive lead to the tuner case.
OSCILLOSCOPE	Connect to test point RF L.P., in series with a 10,000 ohm resistor using direct probe. Set oscilloscope to maximum gain.
SWEEP GENERATOR	Connect to VHF terminals through pad
MARKER GENERATOR	Couple RF output cable loosely to sweep generator cable to provide markers. (Insert insulated wire into top of oscillator mixer tube shield. Connect other end to "RF IN" terminals of generator for zero beat).
VACUUM TUBE VOLTMETER	Connect to test point IF L.P. Use a 100,000 ohm resistor in series with VTVM.
MISCELLANEOUS	Connect a 75 ohm carbon composition resistor in series with a 1000 pf capacitor across IF output.

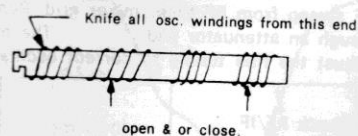
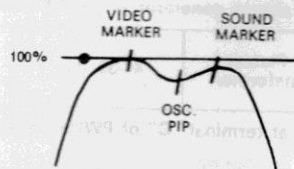
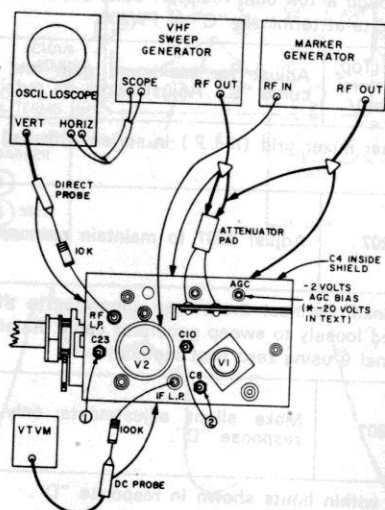
STEP	ADJUST	SWEEP GENERATOR	VHF SIGNAL GENERATOR	ADJUST
1	Adjust Oscillator	Channel 10	Oscillator Freq. for Channel 10 239 mc	With strip screw fully in (fully counter-clockwise on fine tuning shaft) adjust oscillator trimmer C23 to place IF marker midway between sound marker and picture marker. Repeat on all channels except knife oscillator coils instead of adjusting C23. Check to assure fine tuning range minimum +1 mc (to sound) —1.5 mc (to smear).
2	Adjust RF Plate and Mixer Grid Trimmers	Channel 10	193.25 mc 197.75 mc	Adjust C8 RF plate trimmer for proper placing of markers, C10 mixer grid trimmer and gimmick for correct bandwidth and tilt (see curve below). Readjust C8, C10 if required.

Turn off generators and check oscillator injection at IF L.P. Voltage should be between 1.2 volt DC minimum and 4.0 volts DC maximum. If outside limits, replace V2 and repeat steps 1 and 2.

NOTE :

Normally steps 1 and 2 are all the adjustments required. However, if the inserts or tuner components have been disturbed or V1 and/or V2 are replaced, one or more of the following adjustments may be required.

1. If tilt is out of limits on a particular channel, adjustment of L4 by knifing will bring the tilt within limits.
2. If bandwidth is out of limits on most high VHF channels (6-13), adjustment of C7 (up and down positioning) will correct this condition. Also, adjust gimmick if present.
3. Knife appropriate coils on all other channels.
- * 4. If improper responses are obtained after replacing V1 and/or V2, it may be necessary to readjust trimmers C8 and C10. Neutralise with —20 volts to the tuner AGC terminal. Ground IF AGC bus of television chassis and connect oscilloscope to TP3 on PW200 at the second detector. Set oscilloscope for .5 volt P-P, adjust C4 for minimum amplitude of curve, keeping the output from sweep generator (channel 10) adjusted for no more than .5 volt P-P at the second detector test point TP3 on PW200.



SOUND ALIGNMENT

4.5 MC TRAP, SOUND TAKE-OFF, SOUND IF, AND QUADRATURE DETECTOR ALIGNMENT

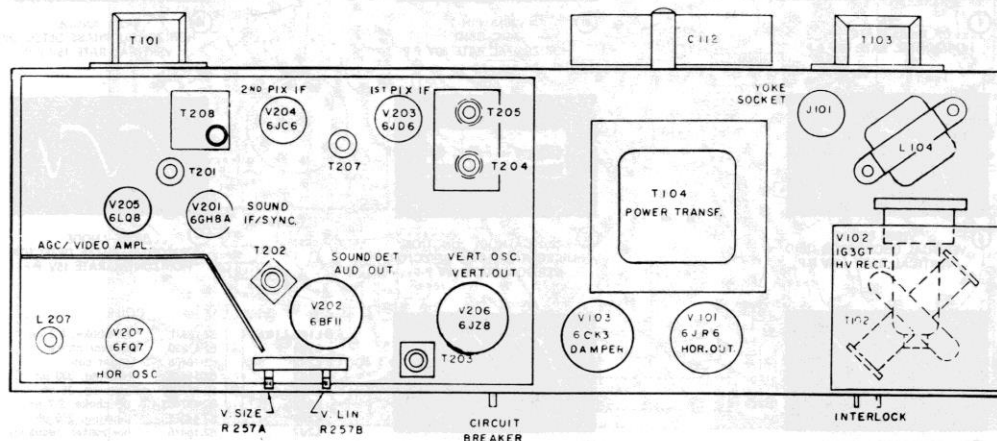
TEST EQUIPMENT CONNECTIONS:

OSCILLOSCOPE: Connect through a sound detector test block to point "O" on PW200.

SIGNAL GENERATOR AM: Connect to TP3 of PW200 through a 4700 ohm resistor.

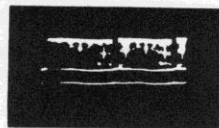
SIGNAL GENERATOR FM: Connect to TP3 of PW200.

STEP	ADJUST	SIGNAL GENERATOR	ADJUST	REMARKS
1		Connect signal generator to TP3 of PW200. Connect oscilloscope through a sound detector test block to point "Q", contrast control set at maximum.		
2	Adjust Sound Take-off Transformer and 4.5 mc Trap	4.5 mc AM Modulated	T201	Adjust T201 top and bottom cores for minimum deflection.
3		Connect oscilloscope to V202 Pin 2, set to maximum gain.		
4	Adjust Sound IF Transformer	4.5 mc AM Modulated	T202	Attenuate signal while peaking T202 top & bottom cores for maximum deflection.
5		Remove AM signal. Connect FM signal to TP3. Connect oscilloscope across speaker.		
6	Adjust Quadrature Detector Transformer	4.5 mc FM Modulated	T203	Adjust T203 for maximum peak.
7		Reduce signal input until a breakout appears on the tips of the waveform.		
8	Adjust Sound IF Transformer	4.5 mc FM Modulated	T202	Adjust T202 top & bottom cores for best gain and symmetrical breakout while reducing the input signal.
9	Sound Sensitivity	A 3500 microvolt signal of 4.5 mc at 7.5 kc deviation should not indicate any breakout.		



— Chassis Layout.

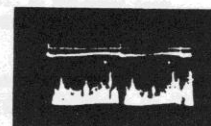
VOLTAGE WAVEFORMS



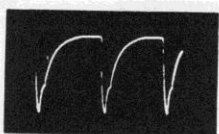
① TP3
SECOND DETECTOR
VERTICAL RATE 3V P-P



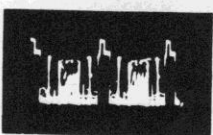
⑦ V205B PIN 9
VIDEO AMPLIFIER PLATE
VERTICAL RATE 90V P-P



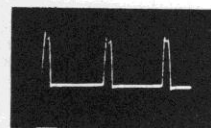
⑬ JUNCTION R224 & C246
VERTICAL RATE 80V P-P



② V101 PIN 2
HORIZONTAL OUTPUT GRID
HORIZONTAL RATE 120V P-P



⑧ JUNCTION R224 & C246
HORIZONTAL RATE 80V P-P



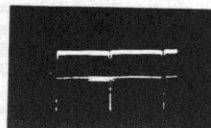
⑭ V205A PIN 3
AGC PLATE
HORIZONTAL RATE 320V P-P



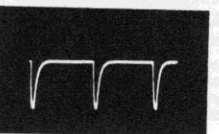
③ TP5
SYNC PLATE
VERTICAL RATE 60V P-P



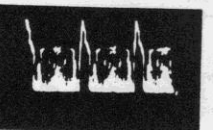
⑨ V205A PIN 2
AGC GRID
VERTICAL RATE 80V P-P



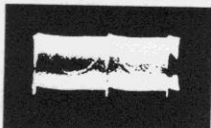
⑮ V104 PIN 2
PICTURE TUBE GRID
VERTICAL RATE 70V P-P



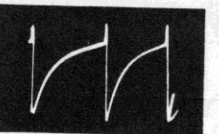
④ TP5
SYNC PLATE
HORIZONTAL RATE 60V P-P



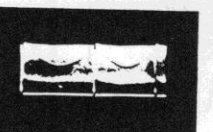
⑩ V205A PIN 2
AGC GRID
HORIZONTAL RATE 80V P-P



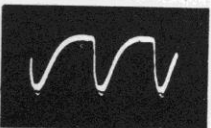
⑯ SR201 ANODE
HORIZONTAL PHASE DETECTOR
VERTICAL RATE 15V P-P



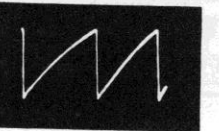
⑤ V206B PIN 10
VERTICAL OSCILLATOR GRID
VERTICAL RATE 140V P-P



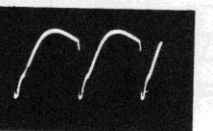
⑪ SR201 CATHODE JUNCTION
HORIZONTAL PHASE DETECTOR
VERTICAL RATE 12V P-P



⑰ SR201 ANODE
HORIZONTAL PHASE DETECTOR
HORIZONTAL RATE 15V P-P



⑥ V206A PINS 6 & 7
VERTICAL OUTPUT GRID
VERTICAL RATE 26V P-P

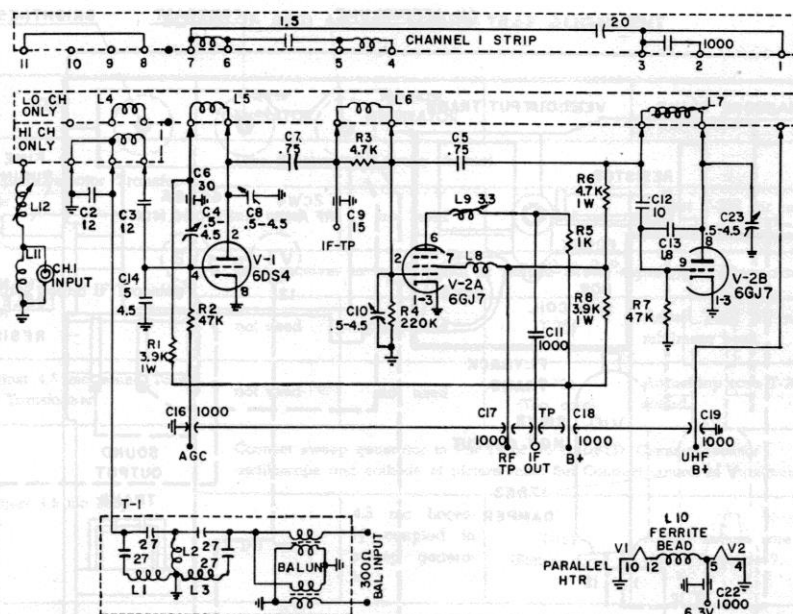


⑫ SR201 CATHODE JUNCTION
HORIZONTAL PHASE DETECTOR
HORIZONTAL RATE 12V P-P

L102, L103
L104
L202
L203
L204
L205
L206
L207

62-12931 RF choke, 8.2 uh.
62-17630 reactor choke
62-19468 shunt coil
62-15864 peaking, 330 uh.
62-116056 peaking, 36 uh.
62-107463 RF choke, 2.7 uh.
62-14071 peaking, 250 uh.
62-16415 horizontal frequency

COILS



RS-4B Tuner Schematic

PW200 SECURITY SEALED CIRCUIT ASSEMBLY

