ELECTRONIC TECHNICIAN

TV-RADIO SCHEMATICS • OVER 30 MANUFACTURERS
COVERS HUNDREDS OF CHASSIS & MODEL NUMBERS
### TELEVISION

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More tabs closer together or farther apart to center picture.

VHF ANTENNA

FOCUS ADJUSTMENT
Change only to improve Focus.

ETCHED CIRCUIT BOARD

HEIGHT
Vertical Linearity
To correct improper picture height or vertical linearity, alternately adjust HEIGHT and VERT. LIN.

PICTURE GUARD

WIDTH CONTROL
In 23" SETS ONLY

Deflection Yoke
Yokes Retaining Spring
In correct picture H. loosen screw on yoke retaining spring. Refer to yoke until picture is straight. Tighten screw.

HV COVER

ETCHED CIRCUIT BOARD

CIRCUIT BREAKER
RESET BUTTON

ETCHED CIRCUIT BOARD

14E305-1

More Data on Reverse Side
VT-119 D.C. RESISTANCE OF PARTS

1. A52-3128 60 Cycle Power Transformer
   Primary: Black-Black 1 Ohm
   H.V. Sec.: Red-R/Y-Red 44 Ohms Center Tapped
   12.8V: Green-G/Y-Green Less than .1 Ohm
   5.0V: Yellow-Yellow Less than .1 Ohm

2. A51-0428 Hor. Osc. & A.F.C. Transformer
   A to C: 29 Ohms
   A to D: 69 Ohms
   A to F: 72 Ohms

3. A52-3104 Audio Output Transformer
   Primary: 360 Ohms
   Secondary: 0.5 Ohms

4. A52-3129 Filter Reactor
   42 Ohms: 6.5 Ohms

5. A52-3106 Vertical Output Transformer
   Primary: 460 Ohms
   Secondary: 4.05 Ohms

6. A52-3096 Deflection Yoke At 25°C
   Horizontal Coils 2 to 7: 35 Ohms
   Vertical Coils 4 to 6 (With temperature compensating resistor): 17.6 Ohms
   (Without thermistor): 13.8 Ohms

7. A52-3120 Horizontal Output Transformer
   Terminals 1-2: 1.98 Ohms
   2-3: 6.0 Ohms
   3-4: 9.0 Ohms
   4-5: 1.8 Ohms
   5-6: 11.5 Ohms
   6-H.V.: 338 Ohms

Electronic Technician Inc. Ojibway Building Duluth 2, Minnesota
NOTES:

- COMP: composition resistor
- FR: porcelain resistor
- Unspecified capacitors are ceramic capacitor.
- MP: metallized capacitor
- OP: oilfilled capacitor
- PA: paper capacitor
- PS: polystyroll capacitor

\[ \Delta \text{: 1600 MMF ceramic capacitor} \]

Voltage readings will vary with setting of controls.
300.0
ALL CAPACITANCE VALUES IN MMF.

ALL RESISTANCE VALUES IN OHMS.

FUSE
IC H. I-HOLD
2A

V. HOLD
BRIGHT
INTERLOCK
HEIGHT 6DE7
00
V. LIN.
C)
6CB6
(1502
V1 6BQ7-A
RF AMP.
TUBE LOCATION CHART
OSC. & MIX.

RF TUNER TU-76P
V1 6BQ7-A
V2 6CQ8

RF AMP.

DELMONICO
TV Portable
Model PTV-19

Electronic Technician
CIRCUIT DIGEST

NOTES: All resistance readings given are in ohms, "K" is Kilohms, "M" is Megohms.
*Indicates varying resistance; allow 30 seconds for meter to settle.
N.C. Denotes no connection at terminal indicated.
T.P. Denotes connection used as terminal post.
FOCUS ADJUSTMENT

Any one of four different voltages (available at the quad-terminal strip mounted directly below the 6CG7 tube) may be utilized as a focus potential. Remove the insulated clip-lead connector (attached to one of the terminals on this strip) and alternately try connecting it to each possible terminal, leaving it connected to the one which gives the best overall focus.
CONDITIONS FOR CHASSIS READINGS

Voltagess and waveshapes were taken under actual operating conditions (normal picture and sound). All readings were taken at positions (see Note A). Voltage and waveshape readings obtained may vary 20% in value due to component tolerances and strength of input signal to chassis under test.

Resistance readings were taken with no power applied. Where readings are affected by control settings, both maximum and minimum values are given. All resistance readings may vary ±5% due to normal component tolerances.

All L, W, and D DENOTATIONS were taken between indicated points and chassis (let power be off). With line voltage maintained at 115 volts AC, a VTVM was used for all waveshapes. A fixed voltage of 1.5 volts DC and a low capacity probe was used for all waveshapes shown.

Notes:
- All resistance readings shown in ohms. All capacitance readings shown in microfarads.
- All frequency readings shown in kilohertz.
- Power measurements shown in volts (V) AC and DC.
- Power input shown in watts (W).
- Capacitance readings shown in picofarads (pF).
- All resistance readings shown in ohms.
- All frequency readings shown in kilohertz.
- Power measurements shown in watts (W).
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- Capacitance readings shown in picofarads (pF).
- All resistance readings shown in ohms.
TUNER ADJUSTMENT

VHF tuning 471226 and 471228 used in chassis 120519C, 5200 and 526C are new MINI-TURRET tuners which require the use of an alignment tool with a tip no wider than 1/8" for adjustment of the local oscillator.
VIDEO BANDPASS: 3.75 MC
ANODE VOLTAGE: 20,000 V.

HIGH FIDELITY AUDIO CONNECTION: A Cathode Follower Jack is located in the rear apron of the chassis to permit quick, easy connection to a high fidelity system. A short-circuiting plug should be inserted in the jack if the cathode follower output is not used.
NOTE—In UHF receivers the filament voltages in the tuner and above the tuner in the heater string will be slightly greater because of the filament voltages of the tuner tubes.
SERVICE HINTS

To provide a simple "Service Saver" procedure, the controls associated with a service condition that can be adjusted without removing the cabinet back are listed adjacent to each picture. To accomplish other control adjustments or to substitute tubes, the cabinet back must be removed.

SERVICE SAVER

PROCEDURE

1. Carefully study face of picture tube.
2. Select one of the pictures on chart that is closest to the picture portrayed by the TV set.
3. Adjust controls indicated adjacent to picture.

NO PICTURE - SNOW
Check - Station Selector Position and Antenna Connections.

WEAK PICTURE
Check - Antenna Connections and Adjustment of Range Control at Front of Receiver.

NORMAL PICTURE
With Weak or Distorted Sound or No Sound.

WHITE LINE

POOR LINEARITY
Check - Vertical Linearity Adjustment.

INSUFFICIENT VERTICAL HEIGHT
Check - Height Adjustment.

NO LIGHT ON PICTURE TUBE

PICTURE BLOOMING

DIAGONAL BARS
Check - Horizontal Hold Control Adjustment.

BEAM ALIGNER (If Used)
Rotate and Slide Backward or Forward Until Best Overall Focus Is Obtained.
In Some Receivers, Position of Aligner Will Be on Tube Base.

TILTED PICTURE
Loosen Locking Screw, Rotate Yoke Until Picture is Level and Push Yoke Forward as Far as it Will Go. Retighten Locking Screw.

MIS-CENTERING
Rotate Tabs Individually or Together Until Picture Is Centered.

Electronic Technician Inc. Ojibway Building Duluth 2, Minnesota
PRODUCTION CHANGE IDENTIFICATION

On chassis with code numbers below 149LX, C168 was .047µf and R170 was 1 Meg. When changing either component, both components should be checked to agree with production code.
Tuner assembly hooks on chassis

Ground Strap Clamp
Mounting Hooks

UHF Tuner adjustment locations

Top view UHF Tuner WT85X25

VHF Tuner adjustment locations

Tune and adjustment locations
To obtain optimum horizontal linearity, a piece of tinfoil is attached to the neck of the picture tube. The foil is held in place with Mylar tape. This tape has the required high voltage breakdown potential. The foil should be removed from the old picture tube and placed on the neck of the new replacement picture tube, before the replacement tube is installed.
NOTE: In UHF receivers the filament voltages in the tuner and above the tuner in the heater string will be slightly greater because of the filament voltages of the tuner tubes.
ELECTRONIC
TECHNICIAN
CIRCUIT DIGEST

MONTEREY WARD
TV Models
WG-4225A, WG4325A

Electronic Technician Inc.  Ojibway Building  Duluth 2, Minnesota

More Data on Reverse Side
Electronic Technician Inc. Ojibway Building Duluth 2, Minnesota
LAST MINUTE CHANGES, ADDITIONS, ETC:

1. In chassis 98D15, the cord remote control model, resistor R-57 was changed from 100,000 ohms, one watt, to 82,000 ohms, two watts (FB-73448).

2. Horizontal sweep circuitry of chassis 98D14C (27 inch model) was changed from that in the 23-inch sets.

DELETED ARE:
- C-87, 68 mmf, 5 kv.

CHANGED ARE:
- R-94, from 8200 ohms, 7 w, to 12,000 ohms, 10 w (73705), R-94.1.
- T-3, the VERTICAL output transformer, from part 89543 to part 89529, T-3.1.

ADDED ARE:
- C-87.1 & C-87.2, both 200 mmf, 1250 v (23958, alt: 23145 or 23745)

3. Capacitor, 1000 mmf, added across R-15 in both 98D14 & 98D15. Also R-106 changes from 20% to 10% tolerance. In 98D15 only, R-5 changes to 10,000 ohms.
PHILCO TV Chassis 12J27

Electronic Technician
CIRCUIT DIGEST

More Data on Reverse Side

TUNER ALIGNMENT SETUP FOR 12N50 VHF TUNER

GIF PADDOING

An RF pad connected between the tuner antenna lead and the 300V generator balance is desirable, if a resonant pad of some type is not already incorporated in the generator cable. The GIF pad should be connected as shown.

The circuit must be in place on the tuner when RF or oscillator alignment is being made.

Electronic Technician Inc. Ojibway Building Duluth 2, Minnesota
4. Leads from VR9-4 and 5 must be twisted together.
3. Green C.W. from LI to L46 should be free from sharp wire ends.
7. Leads from lugs 3, 4, and 5 on H.O.T. panel must be twisted at least 8 twists in length from VR9-4.
6. Leads from Y.S. 3 and 6 and brown damper lead must be dressed under lugs CL17, CL18, and CL19 and away from H.O.T. winding.
8. Leads must be dressed clear of L52 and V18-3.
9. Leads from V13 and V14 caps must be at least 5" apart.

**To Prevent Corona:**
1. VR-14 socket must be of solder points and sharp wire ends.
2. Lead from V14 cup must be at least 4" from any metal of H.V. Cage.
3. Filament leads from H.O.T. to V14 must have slight (if any) downward arc to base away from glass bulb of IG3 tube.
4. All leads from H.O.T. coil to Y.S. must be free of each other and dress away from any metal parts.
5. Leads from H.O.T. coil to V14 must have lead away from H.O.T. winding.
6. Leads from V.S. 3 and 6 and brown damper lead must be dressed under lugs CL17, CL18, and CL19 and away from H.O.T. winding.
7. Leads from lugs 3, 4, and 5 on H.O.T. panel must be twisted at least 8 twists in length from VR9-4.
8. Leads must be twisted away from any metal parts.

**To Prevent Pickup:**
1. Timer power lead must dress under CNL, CL10, and CL16.
2. Bare portion of I.F. lead to tuner must be clamped under dress lug CL13 provided at end of I.F. shield.
3. Glass C.W. from LI to L4 should be free from all other leads and away from subbase.
4. Leads from VR9-4 and 5 must be twisted together for approximately 8 twists in length from VR9-5, 5, and 5, to CL12.
5. Yellow CRT lead should be free from all other leads.

---

**Electronic Technician Circuit Digest**

**PHILCO TV Chassis 12N50 Series**

**New-Matic Plunger and Tubing**

**NEw-MATiC Plunger and Tubing**

**Resistance Chart**

---

Electronic Technician Inc. Ojibway Building Duluth, 2, Minnesota
KRS26A Remote Control
Unit used with KCS356K & T Chassis

PW200 Sealed Circuit I-F and Video Assembly

PW300 Sealed Circuit Deflection Assembly

PW500 Sealed Circuit Video Assembly

Electronic Technician Inc. Ojibway Building Duluth 2, Minnesota
Speaker: 2½" PM dynamic, 8 Ω
Battery: Eveready 216 or R1-20P or equivalent (9 volts)
Current drain: 6 mA at zero signal, 30 mA at 120 mW output

Electronic parts list

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>L₁</td>
<td>Ferrite bar antenna coil</td>
</tr>
<tr>
<td>L₂</td>
<td>Oscillator coil</td>
</tr>
<tr>
<td>L₃</td>
<td>10 kΩ</td>
</tr>
<tr>
<td>L₄</td>
<td>15 kΩ</td>
</tr>
<tr>
<td>L₅</td>
<td>220 kΩ</td>
</tr>
<tr>
<td>L₆</td>
<td>100 kΩ</td>
</tr>
<tr>
<td>L₇</td>
<td>150 kΩ</td>
</tr>
<tr>
<td>L₈</td>
<td>5.6 kΩ</td>
</tr>
<tr>
<td>L₉</td>
<td>10 kΩ</td>
</tr>
<tr>
<td>L₁₀</td>
<td>10 kΩ</td>
</tr>
<tr>
<td>T₁</td>
<td>Interstage transformer</td>
</tr>
<tr>
<td>T₂</td>
<td>Output transformer</td>
</tr>
<tr>
<td>J</td>
<td>Earphone jack</td>
</tr>
<tr>
<td>SP</td>
<td>Speaker, 8 Ω</td>
</tr>
<tr>
<td>SW</td>
<td>Power switch</td>
</tr>
<tr>
<td>SW₁</td>
<td>Automatic/manual switch</td>
</tr>
<tr>
<td>SW₂</td>
<td>Time switch</td>
</tr>
<tr>
<td>SW₃</td>
<td>(built in the watch)</td>
</tr>
<tr>
<td>X₁</td>
<td>2SC 73</td>
</tr>
<tr>
<td>X₂</td>
<td>2SC 76</td>
</tr>
<tr>
<td>X₃</td>
<td>2SD 64</td>
</tr>
<tr>
<td>X₄</td>
<td>2SD 66</td>
</tr>
<tr>
<td>X₅</td>
<td>100 kΩ</td>
</tr>
<tr>
<td>X₆</td>
<td>1.5 kΩ</td>
</tr>
<tr>
<td>X₇</td>
<td>550 kΩ</td>
</tr>
<tr>
<td>X₈</td>
<td>0.1 pf ceramic</td>
</tr>
<tr>
<td>X₉</td>
<td>0.01 pf ceramic</td>
</tr>
<tr>
<td>X₁₀</td>
<td>0.02 pf ceramic</td>
</tr>
<tr>
<td>X₁₁</td>
<td>0.001 pf ceramic</td>
</tr>
<tr>
<td>Xₑ₂</td>
<td>100 kΩ</td>
</tr>
<tr>
<td>Xₑ₃</td>
<td>1.5 kΩ</td>
</tr>
<tr>
<td>Xₑ₄</td>
<td>1.5 kΩ</td>
</tr>
<tr>
<td>Xₑ₅</td>
<td>0.001 pf ceramic</td>
</tr>
<tr>
<td>Xₑ₆</td>
<td>0.001 pf ceramic</td>
</tr>
<tr>
<td>Xₑ₇</td>
<td>10 pf</td>
</tr>
<tr>
<td>Xₑ₈</td>
<td>0.1 pf ceramic</td>
</tr>
<tr>
<td>Xₑ₉</td>
<td>0.005 pf ceramic</td>
</tr>
<tr>
<td>X₁₀₀</td>
<td>0.005 pf ceramic</td>
</tr>
<tr>
<td>D₁</td>
<td>Th123G</td>
</tr>
<tr>
<td>T₁</td>
<td>2SC-76</td>
</tr>
<tr>
<td>T₂</td>
<td>2SD-65</td>
</tr>
<tr>
<td>T₃</td>
<td>T25D-64</td>
</tr>
<tr>
<td>T₄</td>
<td>2SD-65</td>
</tr>
<tr>
<td>T₅</td>
<td>2SC-76</td>
</tr>
<tr>
<td>Th</td>
<td>300 pf</td>
</tr>
</tbody>
</table>

Electronic Technician Inc. Ojibway Building Duluth 2, Minnesota
1. Carrying handle
2. Securing screw for hood
3. Hood
4. AC button "AC"
5. DC button "DC"
6. Off button "OFF"
7. Earphone jacks
8. Speaker
9. Battery case
10. External antenna jack 300Ω
11. External antenna jack 75Ω
12. Built-in telescopic antenna
13. Vertical hold control "VERT"
14. Horizontal hold control "HOR"
15. Brightness control, "BRT"
16. Gain control, "GAIN"
17. Connector prongs, "AC DC 12 V"
18. Channel selector, "CHANNEL"
19. Fine tuning control
20. Pilot lamp
21. Volume control, "VOL"
22. Charge lamp
23. Prongs for battery connection
24. AC cord
25. Earphone, cord, and plug
26. Feeder with plug for external antenna
27. Fuse (0.4 A)
28. Extension cord for AC line

**RECHARGING**

Connect the battery to the set and insert the plug with four holes of the AC cord into the connector prongs (17) of the set and the other plug into the AC outlet.

Press the buttons "AC" (4) and "OFF" (6) simultaneously as shown in the figure.

The set can not be operated for TV reception in this condition.

Required time to accomplish recharge is as follows:

<table>
<thead>
<tr>
<th>If the battery is used</th>
<th>Recharge time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 hour</td>
<td>3.5 hours</td>
</tr>
<tr>
<td>2 hours</td>
<td>7 hours</td>
</tr>
<tr>
<td>3 hours</td>
<td>10 hours</td>
</tr>
</tbody>
</table>

To stop recharge, press the button "OFF" (6).
25A1221-2 UHF TUNER SCHEMATIC
(IF UHF EQUIPPED)

TRUETONE
TV Models 2DC1270A, -2A, -4A

Electronic Technician
CIRCUIT DIGEST

Top Tuner Adjustments

2A523 UHF IF INPUT
(IF UHF EQUIPPED)
More Data on Reverse Side
ELECTRONIC
TECHNICIAN
CIRCUIT DIGEST

WESTINGHOUSE
TV Chassis V2414-1, V2414-2

KEY TO PC BOARD LAYOUT

CONTROL WIRING DIAGRAM
All views seen from rear.

1. HORIZ. HOLD
2. BRIGHTEST R223
3. VERT. HOLD
4. CONTRAST R217
5. AGC LEVEL (ON REAR OF CHASSIS) R303

Electronic Technician Inc. Ojibway Building Duluth, 2, Minnesota

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More Data on Reverse Side

SPG 1 AND SPG 2 SPARK GAPS

SPG 1 slips over pins 1 and 2 of the picture tube. The gap prevents heater burnout, should an arc occur in the gun. If the picture tube is replaced, install the gap as on the original tube. SPG 2 similarly protects Integrator A1.

HORIZONTAL BLANKING CIRCUIT

A negative pulse from the horizontal sweep transformer (violet lead) is applied to grid 1 (pin 2) of the picture tube which cuts off the beam during the horizontal retrace period. The neon bulb acts as a switch which allows the pulse to pass through, but blocks off any transients that may reach the grid during the trace period.

EQUIVALENT CIRCUIT
A-1 AND A-2 INTEGRATORS

B7-4 R 1k 47K
B7-5 R 1k 33K
B7-7 R 1k 68K
B7-8 R 1k 82K
Zenith TV Color Chassis 29JC20

More Data on Reverse Side
Location of Components on Neck of Picture Tube.

Rear View of Picture Tube, Showing Correct Positioning of Neck Components.
More Data on Reverse Side
INSTALLATION

1. Remove dummy cover plate and speaker grille.
2. Install speaker as illustrated.
3. Remove knobs, nuts and trim plate from radio.
4. Position radio behind instrument panel with mounting bushings protruding through control holes in panel. Place trim plate over mounting bushings and attach radio to instrument panel by replacing mounting nuts. Retain radio in mounted position by tightening nuts finger tight.
5. Slip lockwasher over mounting bolt. Insert bolt through reinforcement brace and into captive floating nut on rear bracket. Secure radio by tightening bolt.
6. Tighten mounting nuts securely and replace knobs.
7. Connect "A" leads as illustrated. Install fuse in junction block terminals designated "Radio."
8. Turn on radio and allow it to warm up for a few minutes. Raise antenna to maximum height and tune in a weak station near 1400KC (14 on dial scale). Adjust antenna compensator for maximum volume.

MOTOR NOISE ELIMINATION

On all vehicles except those equipped with the 348 engine, install one strap from the body mounting bracket to the dash-frame brace on the right side only.

INSTALLATION OF GROUND STRAPS

On vehicles equipped with a six cylinder engine, install one strap to the existing screw and lockwasher. Attach the other end of strap to the dash with a tapping screw and internal-external lock washer.

On vehicles equipped with a 283 engine (left) or a 348 engine (right) install one strap to the dash - frame brace with an existing screw and lock washer. Attach the other end of the strap to the dash with a self-tapping screw and internal-external lock washer.
IF RADIO IS POWERED BY BATTERY ELIMINATOR, USE 16 VOLTS FOR PROPER SOLENOID ACTION.

PRINTED CIRCUIT SHOWN IN HEAVY LINES

ELECTRONIC TECHNICIAN
CIRCUIT DIGEST

DELCO
Model 7276605
Auto Radio 1961 Cadillac

PRINTED CIRCUIT BOARD CORRESPOND WITH NUMBERS IN CIRCLES ON SCHEMATIC DIAGRAM.

SCHEMATIC DATA
Voltages measured terminal to chassis with a VTVM—No signal—12.0 volts
Oscillator grid voltage taken tuned to 1000 kc.
Total "A" drain 2.5 amperes.
* Indicates lead from tuning coil assembly.
** Before measuring transistor voltages be sure speaker and transformer are connected to radio. If transistor is replaced adjust bias potentiometer to obtain the proper collector voltage.
† An open fuse resistor will give 0 volts collector voltage.

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Electronic Technician Inc. Ojibway Building Duluth 2, Minnesota
Voltage measured terminal to chassis with a VTVI-No signal and 12.0 volts at Illus. 30.

Oscillator grid voltage taken with set tuned to 1000 Kc.

Total "A" drain at 12 volts - 2.2 amps.

Tolerance on voltages: ± 10%.

* Indicates lead from tuner coil assy.

Before measuring transistor voltages, the shorting type speaker socket must be open and a 4-ohm speaker connected, if transistor is replaced, adjust bias potentiometer (Illus. 67) to obtain proper collector voltage with 12 volts applied to radio.

Illus. 50 is a fuse and resistor for the transistor. Service with exact replacement.

- Output transformer will appear shorted if shorting type speaker switch is not held open.

Electronic Technician Inc. Ojibway Building Duluth 2, Minnesota
SUPPLEMENT TO BULLETIN 6D-884
CHEVROLET RADIO MODEL 985332

There has been a circuit design change in subject model radio which reduces the minimum volume output. To effect this change, the values of two resistors were reduced. Should you elect to make this change on early production sets, BOTH resistors must be changed as follows:

Early Production:

<table>
<thead>
<tr>
<th>ILLUSTRATION NO.</th>
<th>SERVICE PART NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>39</td>
<td>1213224</td>
<td>Res., 330 ohm, 1/2 watt</td>
</tr>
<tr>
<td>43</td>
<td>7280230</td>
<td>Res., 4700 ohm, 1/2 watt</td>
</tr>
</tbody>
</table>

Late Production Change:

<table>
<thead>
<tr>
<th>ILLUSTRATION NO.</th>
<th>SERVICE PART NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>39</td>
<td>1214538</td>
<td>Res., 33 ohm, 1/2 watt</td>
</tr>
<tr>
<td>43</td>
<td>1213486</td>
<td>Res., 470 ohm, 1/2 watt</td>
</tr>
</tbody>
</table>
Before measuring transistor voltages, the shorting type speaker socket must be opened and a 4 ohm speaker connected. If transistor is replaced, adjust bias potentiometer to obtain proper collector voltage with 12 volts input to radio.

*Before making this adjustment check mechanical setting of oscillator core "H." The rear of the core should be 1/4" from the mounting end of the coil form. (This measurement is readily made by inserting a suitable plug in the mounting end of the coil form.) Core adjustment should be made with a non-metallic screw driver.

With the radio installed and the car antenna plugged in adjust the antenna trimmer "G" for maximum volume with the radio tuned to a weak station between 600 and 1000 KC (see sticker on case.)
**MOTOROLA**

Auto Radio
1961 Continental
Model 17MC

**ELECTRONIC TECHNICIAN**

CIRCUIT DIGEST

**WOOD BLOCK**

2ND IF 262.5 KC
1ST IF 262.5 KC

SUPPORT

TECHNICIAN

ELECTRONIC

1610 KC

R21

R23

MAIN LYTIC

PART OF

R24

SWITCH

ON - OFF

R25 //

CIRCUIT DIGEST

RI7

RF TRIM

1610 KC

R20

R18

/∂/

2N573

/∂/

R19

/∂/

CHASSIS

BOARD

2ND ANT TRIM

1610 KC

R26

R22

R25

C25

PART OF

WITH INTENTION OF NOTING ON SOME MODELS

R12 2N641 C15 T2

IF AMP

C17 E7 R5 R14 C16 R3 L6 R4 R1

R2

L7

C20

(R1MC)

C22

2N573 DRIVER

R19 560

R21 560

C25A

PART OF

MAIN LYTIC

ON SOME MODELS

C20

C19

R13

R21

C25

ELECTROLYTIC

PLACIR

CHASSIS

BOARD

2N642

RF PLACIR

CHASSIS

BOARD

2N650

C12 C10 C11 C6 C4 C2 C2 RF AMP

C3

E5 C14 T1 C7 CONV R6 Cmd C5

RIO

E5 CONN

C2 may vary from .01 MF to .025 MF

1277 LOK

R12

+12V 1020 KC

(PTC)

L7

R14 10K

C 170,.01

R8

R10 1105

C1220

R11 680K

R13 9.1

C28

C29

L7

LIMITED

C18

C20

R19

C10

C6

C5

C4

C2

RF AMP

C3

INTERCOLUMN CONNECTIONS

2N641 RF Amp

2N542 Converter

2N541 IF Amp

2N573 Driver

2N176 Push-pull Power Amp

1N139 Detector Diode

1N359 AVC Diode

**TRANSISTOR & DIODE COMPLEMENT**

<table>
<thead>
<tr>
<th>TYPE</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>2N641</td>
<td>RF Amp</td>
</tr>
<tr>
<td>2N542</td>
<td>Converter</td>
</tr>
<tr>
<td>2N541</td>
<td>IF Amp</td>
</tr>
<tr>
<td>2N573</td>
<td>Driver</td>
</tr>
<tr>
<td>2N176</td>
<td>Push-pull Power Amp</td>
</tr>
<tr>
<td>1N139</td>
<td>Detector Diode</td>
</tr>
<tr>
<td>1N359</td>
<td>AVC Diode</td>
</tr>
</tbody>
</table>

**OSCILLOSCOPE HEADS**

1A10 KC

2A10 KC

1610 KC

1610 KC

6TH IF 2N650 RC 2N650 RC 2N650 RC

TOP CORE

WOOD BLOCK

SUPPORT

REAR VIEW

CAUTION: AFTER ALIGNMENT OF IF CORES, TUNER SHOULD BE SEATED INTO HOUSING AND GROUNDING STRAPS SHOULD BE SOLDERED INTO POSITION BEFORE ANY TUNER TRIMMER OR CORE ALIGNMENT IS ATTEMPTED.

**TUNER ALIGNMENT**

PLUG TO FIT RECEIVER ANTENNA RECEPTACLE

TO SIGNAL GENERATOR

FOR MODEL (TMC USE 1800W)

FOR MODEL (TMC USE 3000W)

METAL SHELF CAN MUST BE ATTACHED TO PLUG

DUMMY ANTI

**CAUTION**

1. The values shown for R1 and R4 are nominal, however, R1 may vary from 120K to 180K and R4 may vary from 18K to 21K to meet sensitivity specifications in production.

2. The values shown for C2 and C6 are nominal, however, C2 may vary from 100pF to 150pF and C6 may vary from 270pF to 330pF.

3. The values shown for R5 and R6 are nominal, however, both values may vary up to 0.5 times in production.

4. **A** LEAD MUST BE CONNECTED TO POSITIVE (+) SIDE OF POWER SUPPLY, RAISED TO OPERATE AND DAMAGE TO COMPONENTS WILL RESULT IF CONNECTED OTHERWISE.

Electronic Technician Inc. Ojibway Building Duluth 2, Minnesota
INTERFERENCE ELIMINATION

The ignition noise suppression capacitors supplied with the FM-900 must be installed, even though the car may have existing suppression equipment for an AM radio.

POWER SUPPLY REQUIREMENTS - It is preferable to use a storage battery (without a battery charger) in place of a battery eliminator. If a battery eliminator is used, it must be well regulated and filtered.

TRANSISTOR REPLACEMENT - When replacing a transistor, make sure transistor insulator is in place and well greased and that the mounting screws are securely and evenly tightened.

More Data on Reverse Side
ECC 85
EM 84
ECH 81
EF 80
EABC 80
EL 84

<table>
<thead>
<tr>
<th>Wavebands / Gamines trendies</th>
<th>UKW</th>
<th>KW</th>
<th>MW</th>
<th>LW</th>
</tr>
</thead>
<tbody>
<tr>
<td>87.5 - 100 MC / Mc/s</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>555 - 1620 kc / kc/s</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>145 - 345 kc / kc/s</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IF/MF/FL. AM = 460 kc / kc/s</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FM = 10,7 MC / Mc/s</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Electronic Technician Inc. Ojibway Building Duluth 2, Minnesota
Power Supply: Flashlight Batteries
Mercury Batteries
Eveready 915 or 1015
Ray-O-Vac 7LP or 7R
Eveready E9
Mallory M15
Burgess
No Signal Current Drain
12 MA

Electronic Technician Inc. Ojibway Building Duluth 2, Minnesota
TUBE LAYOUT

TUNER SECTION

Electronic Technician Inc.   Ojibway Building     Duluth 2, Minnesota
AVERAGE OUTPUT VOLTAGES AT TRANSISTORS READ WITH 206 MV VOLT METER

TR-1  TR-3  TR-4
RECENT
TO
CHASSIS
GROUND
E
.27
.42
e
2.4
11.11
-4.06
0
6.9
f.5
-405
43
1.5
6.1
0.8
TURN TO
MARIN
AMNON
MOUND
E
.94
B
-.91
O
.16
1.77
1.92
C
10.6
If 11.7
6- -AN
55
11.,7
15.3
10.6
11.7
-6.35
43
1.5
6.1
0.8
SASE OF TR-2
10 111-
111//111
NEC
..4.7
3112%
A
C1
r;70
Ii
COMPONENT WIRING
0
SASE
TRI BASE
TRI COL
LINE
SPKR
T112 COL
F CHOKE
1.1
MI4
L2
Re
3311
T1
03C
1 K
.05
XFMR
T.
R3
C
11 SW
5
t
2
VAC
60,W
A., 2Y
247x185
C22
1300
.002?
600V-
1100V -
4,
CHASSIS
COMMON
2
L3
INPUT
C011.
C25
- .047
4.75
4W
6.25
2W
R211
275
NI 2H
L
SW -I AS VIEWED FROM TOP
TR SWITCH IN RECEIVE POSITION
NOTE:
CHASSIS COMMON IS NOT THE SAME AS THE 117V AC GROUND. DO NOT USE CHASSIS COMMON FOR ANY MEASUREMENT INVOLVING THE 117V AC LINE.
SW -1 SHOWN IN REC POSITION
SW -2 SHOWN IN V OR 200 KC POSITION
MEASURE TRI EMMITTER CURRENT ACROSS R23.
WITH SW -I IN RECEIVE POSITION, QUIESCENT VOLTAGE SHOULD BE APPROX .15V.
VOLTAGE WHEN SIGNAL IS PRESENT DROPS TO .05 V.
TYPICAL TUBE SOCKET VOLTAGES

<table>
<thead>
<tr>
<th>Symbol, Type, Function</th>
<th>Operation Pin 1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1 - 6AL6</td>
<td>Receive 0 -77</td>
<td>220</td>
<td>H</td>
<td>H</td>
<td>0</td>
<td>-80</td>
<td>265</td>
<td>265</td>
<td></td>
</tr>
<tr>
<td>Crystal Oscillator/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R.F. Power Amplifier</td>
<td>Transmit 0 -6.6</td>
<td>105</td>
<td>H</td>
<td>H</td>
<td>0</td>
<td>-7.2</td>
<td>190</td>
<td>245</td>
<td></td>
</tr>
<tr>
<td>V2 - 6BA6</td>
<td>Receive 0 0</td>
<td>H</td>
<td>H</td>
<td>H</td>
<td>163</td>
<td>82</td>
<td>0.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R.F. Amplifier</td>
<td>Transmit -92</td>
<td>0</td>
<td>H</td>
<td>H</td>
<td>211</td>
<td>166</td>
<td>0.4</td>
<td></td>
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<tr>
<td>V3 - 6BN6</td>
<td>Receive -3.2</td>
<td>0</td>
<td>H</td>
<td>H</td>
<td>158</td>
<td>66</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mixer - Oscillator</td>
<td>Transmit -3.7</td>
<td>0</td>
<td>H</td>
<td>H</td>
<td>202</td>
<td>74</td>
<td>-6.1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Squelch control maximum clockwise.
** Squelch control maximum counterclockwise.
Voltage measured to chassis with VTVM (RCA VoltOhmmeter or equivalent) and are positive except where noted.
Transmitter tuned and loaded, with no signal input to receiver.

Electronic Technician Inc. Ojibway Building Duluth 2, Minnesota
VU METER ADJUSTMENT

Proceed to adjust the VU meter in the following manner:

1. Remove control knobs and control escutcheon assembly.
2. Connect audio signal generator to "Mic Input Ch. 1" jack (J1).
3. Turn Tape Recorder "ON" and adjust "VOL. 1" control to 3/4 of full volume or greater.
4. Depress "RIGHT RECORD SAFETY LOCK" and move slightly to right to lock in place.
5. Rotate "MONITOR" control fully clockwise.
6. Connect AC VTVM of at least 11 megohms input resistance to "EXT. AMP. CH. 1" jack (J4).
7. Turn "METER SELECTOR" control to "CH. 1".
8. Adjust signal generator for approximately 2 volts at 1000 cps on the VTVM.
9. Adjust "METER LEVEL" control (R57), on mechanism chassis, until the VU meter reads 100°-c (0 db).
10. Replace control escutcheon assembly and control knobs.
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9. Adjust "METER LEVEL" control (R57), on mechanism chassis, until the VU meter reads 100% (0 db).
10. Replace control escutcheon assembly and control knobs.
WESTINGHOUSE Hi-Fi Tuner Pre-Amp
V-2511-1 Amp & Power Supply V-2510-1
Model H/M 1300, 1301, 1302, 1303.

Cartridge - Stylus replacement.
STEREOPHONIC CARTRIDGE
COMA GRIP / HERE

Dial cord stringing.

Frequency response curve.

V-2510-1 Schematic diagram.