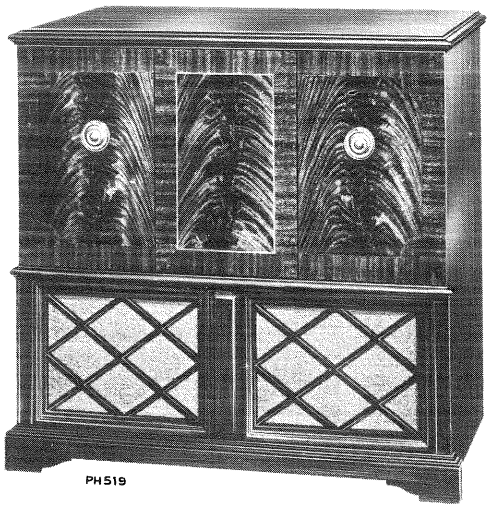
RCA VICTOR



Model TA128 — Walnut, Mahogany or Oak

TELEVISION, AM-FM RADIO PHONOGRAPH COMBINATION MODEL TA128

Chassis Nos. KCS42A, RK135D
Mfr. No. 274

SERVICE DATA

— 1950 No. T7 —

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

GENERAL DESCRIPTION

Model TA128 television, AM-FM radio, phonograph combination employs twenty-six tubes plus two rectifiers and a 12LP4 kinescope. The radio tuner unit which feeds through the television audio system covers the AM and the FM broadcast bands. Two record changers are provided to play 33⅓, 45 and 78 RPM records.

Features of the television unit are full twelve channel coverage; FM sound system; improved picture brilliance; picture A-G-C; A-F-C horizontal hold; stabilized vertical hold; two stages of video amplification; noise saturation circuits; improved sync separator and clipper; four mc. band width for picture channel and reduced hazard high voltage supply.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE.....87 square inches on a 12LP4 kinescope

TELEVISION R-F FREQUENCY RANGE

All 12 television channels, 54 mc. to 88 mc., 174 mc. to 216 mc.
Fine Tuning Range..±250 kc. on chan. 2, ±650 kc. on chan. 13
Picture Carrier Frequency .....25.75 mc.
Sound Carrier Frequency .....21.25 mc.

RADIO TUNING RANGE

Broadcast .....540-1,600 kc.
Frequency Modulation .....88-108 mc.
Intermediate Frequency—AM .....455 kc.
Intermediate Frequency—FM .....10.7 mc.

POWER SUPPLY RATING.....115 volts, 60 cycles, 230 watts

AUDIO POWER OUTPUT RATING.....6 watts max.

CHASSIS DESIGNATIONS

Television Chassis KCS42A
Radio Chassis RK135D
33⅓/78 RPM Record Changer 960282
45 RPM Record Changer.....RP168

Refer to Service Data 960282 or RP168 for information on the record changers.

LOUDSPEAKER 92569-8.....12 inch PM Dynamic
Voice Coil Impedance .....3.2 ohms at 400 cycles

WEIGHT

Chassis with Tubes in Cabinet.....180 lbs.
Shipping Weight.....207 lbs.

DIMENSIONS (inches)	Width	Height	Depth
Cabinet (outside).....	36¼	34½	23½
Chassis (overall).....	18⅝	17	18½

RECEIVER ANTENNA INPUT IMPEDANCE. 300 ohms balanced

If necessary, the television chassis may be fed separately from either a 300 ohm balanced line or a 72 ohm co-ax.

RCA TUBE COMPLEMENT

	Tube Used	(Television Chassis)	Function
(1)	RCA 6AG5		R-F Amplifier
(2)	RCA 6AG5		Converter
(3)	RCA 6J6		R-F Oscillator
(4)	RCA 6AU6		1st Sound I-F Amplifier
(5)	RCA 6AU6		2nd Sound I-F Amplifier
(6)	RCA 6AL5		Sound Discriminator
(7)	RCA 6AV6		1st Audio Amplifier
(8)	RCA 6V6GT		Audio Output
(9)	RCA 6BA6		1st Picture I-F Amplifier
(10)	RCA 6AG5		2nd Picture I-F Amplifier
(11)	RCA 6BA6		3rd Picture I-F Amplifier
(12)	RCA 6AG5		4th Picture I-F Amplifier
(13)	RCA 6AL5		Picture 2nd Detector & Sync Limiter
(14)	RCA 12AU7		1st and 2nd Video Amplifier
(15)	RCA 6SN7GT		AGC Amplifier & Vertical Sweep Osc.
(16)	RCA 6SN7GT		AGC Rectifier & 1st Sync Separator
(17)	RCA 6SN7GT		Sync Amplifier & 2nd Sync Separator
(18)	RCA 6K6GT		Vertical Sweep Output
(19)	RCA 6SN7GT		Horizontal Sweep Oscillator and Control
(20)	RCA 6BG6G		Horizontal Sweep Output
(21)	RCA 6W4GT		Damper
(22)	RCA 1B3-GT/8016		High Voltage Rectifier
(23)	RCA 5U4G		Power Supply Rectifier
(24)	RCA 12LP4		Kinescope
		(Radio Tuner Chassis)	
(1)	RCA 6J6		Mixer and Oscillator
(2)	RCA 6BA6		I-F Amplifier
(3)	RCA 6AU6		F-M Driver
(4)	RCA 6AL5		Ratio Detector
(5)	RCA 6BF6		AM Detector AVC and Phone Preamp.

Specifications continued on page 2

TA128

ELECTRICAL AND MECHANICAL SPECIFICATIONS (Continued)

PICTURE I-F FREQUENCIES

Picture Carrier Frequency	25.75 mc.
Adjacent Channel Sound Trap	27.25 mc.
Accompanying Sound Traps	21.25 mc.
Adjacent Channel Picture Carrier Trap	19.75 mc.

SOUND I-F FREQUENCIES

Sound Carrier Frequency	21.25 mc.
Sound Discriminator Band Width between peaks	350 kc.

VIDEO RESPONSE	To 4 mc.
FOCUS	Magnetic
SWEEP DEFLECTION	Magnetic
SCANNING	Interlaced, 525 line
HORIZONTAL SCANNING FREQUENCY	15,750 cps
VERTICAL SCANNING FREQUENCY	60 cps
FRAME FREQUENCY (Picture Repetition Rate)	30 cps

OPERATING CONTROLS (front panel)

Channel Selector, Fine Tuning	Dual Control Knobs
Tone, Sound Volume and On-Off Switch	Dual Control Knobs
Picture Horizontal Hold, Picture Vertical Hold	Dual Control Knobs
Picture Brightness	Dual Control Knobs
Function Switch	Single Control Knob
Radio Tuning	Single Control Knob

NON-OPERATING CONTROLS

Horizontal Centering	rear chassis adjustment
Vertical Centering	rear chassis adjustment
Width	rear chassis screwdriver adjustment
Width Selector Switch	rear chassis screwdriver adjustment
Height	rear chassis adjustment
Horizontal Linearity	rear chassis screwdriver adjustment
Vertical Linearity	rear chassis adjustment
Horizontal Drive	rear chassis screwdriver adjustment
Horizontal Oscillator Frequency	bottom chassis adjustment
Horizontal Oscillator Waveform	side chassis adjustment
Focus	rear chassis adjustment
Ion Trap Magnet	top chassis adjustment
Deflection Coil	top chassis wing nut adjustment
Focus Coil	top chassis screwdriver adjustment

HIGH VOLTAGE WARNING

OPERATION OF THIS RECEIVER OUTSIDE THE CABINET OR WITH THE COVERS REMOVED, INVOLVES A SHOCK HAZARD FROM THE RECEIVER POWER SUPPLIES. WORK ON THE RECEIVER SHOULD NOT BE ATTEMPTED BY ANYONE WHO IS NOT THOROUGHLY FAMILIAR WITH THE PRECAUTIONS NECESSARY WHEN WORKING ON HIGH VOLTAGE EQUIPMENT. DO NOT OPERATE THE RECEIVER WITH THE HIGH VOLTAGE COMPARTMENT SHIELD REMOVED.

KINESCOPE HANDLING PRECAUTIONS

DO NOT OPEN THE KINESCOPE SHIPPING CARTON, INSTALL, REMOVE OR HANDLE THE KINESCOPE IN ANY MANNER UNLESS SHATTERPROOF GOGGLES AND HEAVY GLOVES ARE WORN. PEOPLE NOT SO EQUIPPED SHOULD BE KEPT AWAY WHILE HANDLING KINESCOPES. KEEP THE KINESCOPE AWAY FROM THE BODY WHILE HANDLING.

The kinescope bulb encloses a high vacuum and, due to its large surface area, is subjected to considerable air pressure. For these reasons, kinescopes must be handled with more care than ordinary receiving tubes.

The large end of the kinescope bulb—particularly that part at the rim of the viewing surface—must not be struck, scratched or subjected to more than moderate pressure at any time. In installation, if the tube sticks or fails to slip smoothly into its socket, or deflecting yoke, investigate and remove the cause of the trouble. Do not force the tube. Refer to the Receiver Installation section for detailed instructions on kinescope installation. All RCA kinescopes are shipped in special cartons and should be left in the cartons until ready for installation in the receiver. Keep the carton for possible future use.

The following adjustments are necessary when turning the receiver on for the first time.

1. Turn the radio FUNCTION switch to Tel.

2. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid-position.

3. Set the STATION SELECTOR to the desired channel.

4. Adjust the FINE TUNING control for best sound fidelity and SOUND VOLUME for suitable volume.

5. Turn the BRIGHTNESS control fully counter-clockwise, then clockwise until a light pattern appears on the screen.

6. Adjust the VERTICAL hold control until the pattern stops vertical movement.

7. Adjust the HORIZONTAL hold control until a picture is obtained and centered.

8. Turn the BRIGHTNESS control counter-clockwise until the retrace lines just disappear.

9. Adjust the PICTURE control for suitable picture contrast.

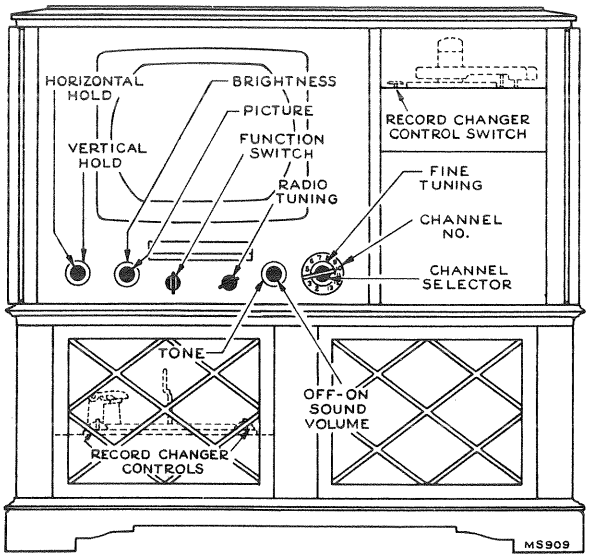


Figure 1—Receiver Operating Controls

10. After the receiver has been on for some time, it may be necessary to readjust the FINE TUNING control slightly for improved sound fidelity.

11. In switching from one station to another, it may be necessary to repeat steps numbers 4 and 9.

12. When the set is turned on again after an idle period, it should not be necessary to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step number 4 is generally sufficient.

13. If the positions of the controls have been changed, it may be necessary to repeat steps numbers 1 through 9.

14. For radio operation turn the FUNCTION switch to AM or FM and tune in station with the radio TUNING control.

15. For phono operation, turn the FUNCTION switch to PH for operation of the 33⅓/78 rpm record changer, or to XPH for operation of the 45 rpm record changer.

THE TELEVISION SECTION OF THE CHASSIS USED IN MODEL TA128 IS SIMILAR TO THE CHASSIS OF MODELS T120 AND T121.

REFER TO T120, T121 SERVICE DATA ON PAGES 199 TO 210 INCLUSIVE FOR TELEVISION ALIGNMENT PROCEDURE, TEST PATTERN PHOTOGRAPHS, RESPONSE CURVES AND WAVEFORM PHOTOGRAPHS.

INSTALLATION INSTRUCTIONS

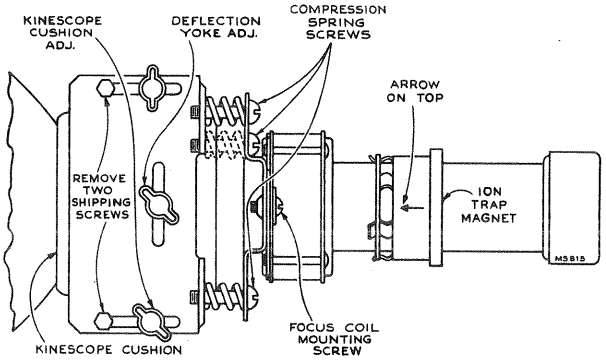


Figure 2—Yoke and Focus Coil Adjustments

Connect the antenna transmission line to the receiver antenna terminals.

Plug the receiver power cord into a 115 volt a-c power source. Turn the receiver power switch to the "on" position, the function switch to "tel," the brightness control three-quarters clockwise, and the picture control counter-clockwise.

ION TRAP MAGNET ADJUSTMENT.—Set the ion trap magnet approximately in the position shown in Figure 2. Starting from this position adjust the magnet by moving it forward or backward at the same time rotating it slightly around the neck of the kinescope for the brightest raster on the screen. Reduce the brightness control setting until the raster is slightly above average brilliance. Adjust the focus control (R191 on the chassis rear apron) until the line structure of the raster is clearly visible. Readjust the ion trap magnet for maximum raster brilliance. The final touches on this adjustment should be made with the brightness control at the maximum position with which good line focus can be maintained.

DEFLECTION YOKE ADJUSTMENT.—If the lines of the raster are not horizontal or squared with the picture mask, rotate the deflection yoke until this condition is obtained. Tighten the yoke adjustment wing screw.

PICTURE ADJUSTMENTS.—It will now be necessary to obtain a test pattern picture in order to make further adjustments. See steps 3 through 9 of the receiver operating instructions.

If the Horizontal Oscillator and AGC System are operating properly, it should be possible to sync the picture at this point. However, if the AGC threshold control is misadjusted, and the receiver is overloading, it may be impossible to sync the picture.

If the receiver is overloading, turn R138 on the rear apron (see Figure 3) clockwise until the set operates normally and the picture can be synced.

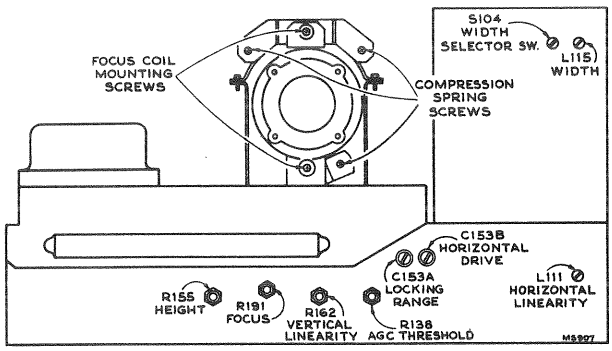


Figure 3—Rear Chassis Adjustments

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT.—Turn the horizontal hold control to the extreme counter-clockwise position. The picture should remain in horizontal sync. Momentarily remove the signal by switching off channel then back. Normally the picture will be out of sync. Turn the control clockwise slowly. The number of diagonal black bars will be gradually reduced and when only 3 bars sloping downward to the left are obtained, the picture will pull into sync upon slight additional clockwise rotation of the control. Pull in should occur when the control is approximately 90 degrees from the extreme counter-clockwise position. The picture should remain in sync for approximately 90 degrees of additional clockwise rotation of the control. At the extreme clockwise position, the picture should be out of sync and should show 1 vertical or diagonal black bar in the raster.

If the receiver passes the foregoing checks and the picture is normal and stable, the horizontal oscillator is properly aligned. Skip "Alignment of Horizontal Oscillator" and proceed with "Focus Coil Adjustments."

ALIGNMENT OF HORIZONTAL OSCILLATOR.—If in the above check the receiver failed to hold sync with the hold control at the extreme counter-clockwise position or failed to hold sync over 90 degrees of clockwise rotation of the control from the pull-in point, it will be necessary to make the following adjustments:

Horizontal Frequency Adjustment.—Turn the horizontal hold control to the extreme clockwise position. Tune in a television station and adjust the T109 horizontal frequency adjustment (under the chassis) until the picture is just out of sync and the horizontal blanking appears as a vertical or diagonal black bar in the raster.

Horizontal Lock in Range Adjustment.—Set the horizontal hold control to the full counter-clockwise position. Momentarily remove the signal by switching off channel then back. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 3 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C153A slightly clockwise. If less than 3 bars are present, adjust C153A slightly counter-clockwise. Turn the picture control counter-clockwise, momentarily remove the signal and recheck the number of bars present at the pull-in point. Repeat this procedure until 3 bars are present.

Repeat the adjustments under "Horizontal Frequency Adjustment" and "Horizontal Locking Range Adjustment" until the conditions specified under each are fulfilled. When the horizontal hold operates as outlined under "Check of Horizontal Oscillator Alignment" the oscillator is properly adjusted.

If it is impossible to sync the picture at this point and the AGC system is in proper adjustment it will be necessary to adjust the Horizontal Oscillator by the method outlined in the alignment procedure For field purposes paragraph "A" under Horizontal Oscillator Waveform Adjustment may be omitted.

FOCUS COIL ADJUSTMENTS.—The focus coil should be adjusted so that there is approximately ¼ inch of space between the rear cardboard shell of the yoke and the flat of the front face of the focus coil. This spacing gives best average focus over the face of the tube. However, it may be necessary to change this distance slightly in order to compensate for small differences in strength of the permanent magnets in the coil. If the receiver focuses with the focus control towards the clockwise end of its range, the focus coil should be moved toward the yoke and if focus is obtained towards the counter-clockwise end of the control, the coil should be moved away from the yoke. In order to prevent the beam from striking the neck of the kinescope, it is important that the axis of the hole through the focus coil should be kept in accurate alignment with the axis of the neck of the kinescope.

CENTERING ADJUSTMENTS.—Centering is obtained by loosening the two focus coil mounting screws and sliding the coil up or down or from side to side. If a corner of the raster is shadowed, check the position of the ion trap magnet. In extreme cases it may be necessary to adjust one or more of the focus coil compression screws to eliminate a corner shadow.

Recheck the position of the ion trap magnet to insure that maximum brilliance is obtained.

WIDTH, DRIVE AND HORIZONTAL LINEARITY ADJUSTMENTS.—Adjustment of the horizontal drive control affects the high voltage applied to the kinescope. In order to obtain the highest possible voltage, hence the brightest and best focused picture, turn the horizontal drive control counter-clockwise until the left side of the picture begins to stretch.

Adjust the horizontal linearity control L111 to provide best linearity. Adjust the width control until the picture just fills the mask.

Adjustments of the horizontal drive control affect horizontal oscillator hold and locking range. If the drive control was adjusted, recheck the oscillator alignment.

FOCUS.—Adjust the focus control (R191 on chassis rear apron) for maximum definition in the test pattern vertical "wedge" and best focus in the white areas of the pattern.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS.—Adjust the height control (R155 on chassis rear apron) until the picture fills the mask vertically. Adjust vertical linearity (R162 on rear apron), until the test pattern is symmetrical from top to bottom. Adjustment of either control will require a readjustment of the other. Adjust centering to align the picture with the mask.

CHECK TO SEE THAT THE CUSHION AND YOKE THUMBSCREWS AND THE FOCUS COIL MOUNTING SCREWS ARE TIGHT.

AGC THRESHOLD CONTROL.—The AGC threshold control R138 is adjusted at the factory and normally should not require readjustment in the field.

To check the adjustment of the AGC Threshold Control, tune in a strong signal, sync the picture and turn the picture control to the maximum clockwise position. Turn the brightness control counter-clockwise until the vertical retrace lines are just invisible. Momentarily remove the signal by switching off channel and then back. If the picture reappears immediately, the receiver is not overloading due to improper setting of R138. If the picture requires an appreciable portion of a second to reappear, R138 should be readjusted.

Set the picture control at the maximum clockwise position. Turn R138 fully clockwise. The top one-half inch of the picture may be bent slightly. This should be disregarded. Turn R138 counter-clockwise until there is a very, very slight bend or change of bend in the top one-half inch of the picture. Then turn R138 clockwise just sufficiently to remove this bend or change of bend.

If the signal is very weak, the above method may not work as it may be impossible to get the picture to bend. In this case, turn R138 counter-clockwise until the snow in the picture becomes more pronounced, then clockwise until the best signal to noise ratio is obtained.

The AGC control adjustment should be made on a strong signal if possible. If the control is set too far counter-clockwise on a weak signal, then the receiver may overload when a strong signal is received.

CHECK OF R-F OSCILLATOR ADJUSTMENTS.—Tune in all available stations to see if the receiver r-f oscillator is adjusted to the proper frequency on all channels. If adjustments are required, these should be made by the method outlined in the alignment procedure The adjustments for channels 2 through 5 and 7 through 12 are available from the front of the cabinet by removing the station selector escutcheon as shown in Figure 4. Adjustment for channel 13 is on top of the chassis and channel 6 adjustment is in the kinescope well.

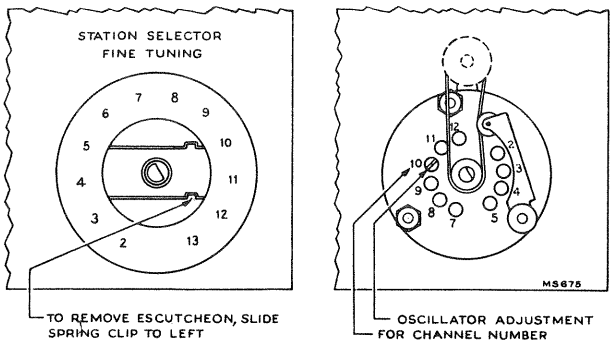


Figure 4—R-F Oscillator Adjustments

RECORD CHANGER OPERATION.—Turn the receiver function switch to each phono position and check each record player for proper operation.

RADIO OPERATION.—Turn the receiver function switch to AM and FM positions and check the radio for proper operation. Tune in a station of known frequency. If the dial pointer does not point to the correct spot on the dial, slip the dial pointer on the dial cord until the proper indication is obtained.

Replace the cabinet back and make sure that the screws are tight in order to prevent rattling at high volume.

WEAK SIGNAL AREA OPERATION.—Since the vast majority of receivers are sold in strong signal areas, the chassis are aligned to produce the cleanest pictures in those areas. However, if the receiver is to be operated in a weak signal area, better performance can be obtained by "peaking" the r-f unit.

To peak the r-f unit in these receivers, disconnect the 390 ohm resistor which is on top of the r-f unit chassis. Adjust L66 to obtain the best possible picture on the weakest low channel station received. By this action, the r-f gain is increased 50% at the expense of r-f bandwidth and an improvement in the weak signal picture results.

If the peaked receiver is subsequently taken to a strong signal area, the resistor R14 should be connected in place and L66 adjusted for "flat" response on the low channels.

CHASSIS REMOVAL.—To remove the chassis from the cabinet for repair or installation of a new kinescope, remove the back and the knobs, unplug all cables and remove the chassis bolts under the cabinet. Withdraw the chassis from the back of the cabinet. The kinescope is held on the chassis by means of a special strap, so that the chassis and the kinescope can be handled together, as a unit.

KINESCOPE HANDLING PRECAUTION.—Do not install, remove, or handle the kinescope in any manner, unless shatterproof goggles and heavy gloves are worn. People not so equipped should be kept away while handling the kinescope. Keep the kinescope away from the body while handling.

To remove the kinescope, remove the kinescope socket, the ion-trap magnet, and the second-anode connector. Loosen the cross-recessed head screw on the kinescope strap, as shown in Figure 6. Withdraw the kinescope toward the front of the chassis.

INSTALLATION OF KINESCOPE.—Slide the kinescope cushion toward the rear of the chassis. Loosen the deflection yoke adjustment, slide the yoke toward the rear of the chassis and tighten.

The kinescope second anode contact is a recessed metal well in the side of the bulb. The tube must be installed so that this contact is up but rotated approximately 30 degrees toward the high-voltage compartment.

Insert the neck of the kinescope through the deflection and focus coils. If the tube sticks, or fails to slip into place smoothly, investigate and remove the cause of the trouble. Do not force the tube.

Slip the ion trap magnet assembly over the neck of the kinescope.

Connect the kinescope socket to the tube base.

Connect the high voltage lead to the kinescope second anode socket.

Wipe the kinescope screen surface and front panel safety glass clean of all dust and finger marks.

Tighten the cross-recessed head screw on the kinescope strap.

As may be seen by inspection, the radio dial lights and dial pointer are attached to the cabinet front panel. The dial cord is attached to the receiver chassis. The method of attachment may be seen in Figure 5.

Slide the dial pointer to the stop on the high frequency end of the dial. Turn the radio tuning shaft until the gang is completely unmeshed.

Slide the chassis into the cabinet until there is sufficient slack in the pilot light cable, then attach the pilot light sockets to the pilot light bracket.

Insert the chassis to its proper position, then install the six chassis bolts and tighten. Loosen the kinescope strap from the rear of the chassis. Push the kinescope forward until the face of the tube is against the mask. Push the yoke cushion forward against the kinescope flare, then tighten the cushion adjusting screws. Push the yoke forward and tighten. Tighten the kinescope strap. Replace the control knobs.

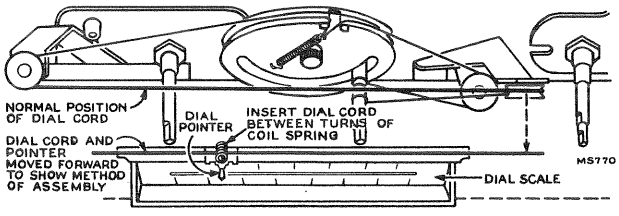


Figure 5—Dial Cord and Pointer Assembly

To hook up the dial pointer, reach over the television chassis to the radio and press the dial cord well into the coil spring.

Turn the set on and to radio position to see that the dial lighting is correct. If it is not, adjust the dial lights and shields. Tune in a station of known calibration and check the dial calibration.

Perform the entire television set-up procedure beginning with Ion Trap Magnet Adjustment.

CABINET ANTENNA.—A cabinet antenna is provided which may be employed in strong signal areas in which no reflections are experienced. The antenna leads are brought out near the receiver antenna terminals.

The link on the antenna terminal board on the back of the cabinet is for use in case it is desirable to connect a separate "A" band antenna.

CHASSIS TOP VIEW

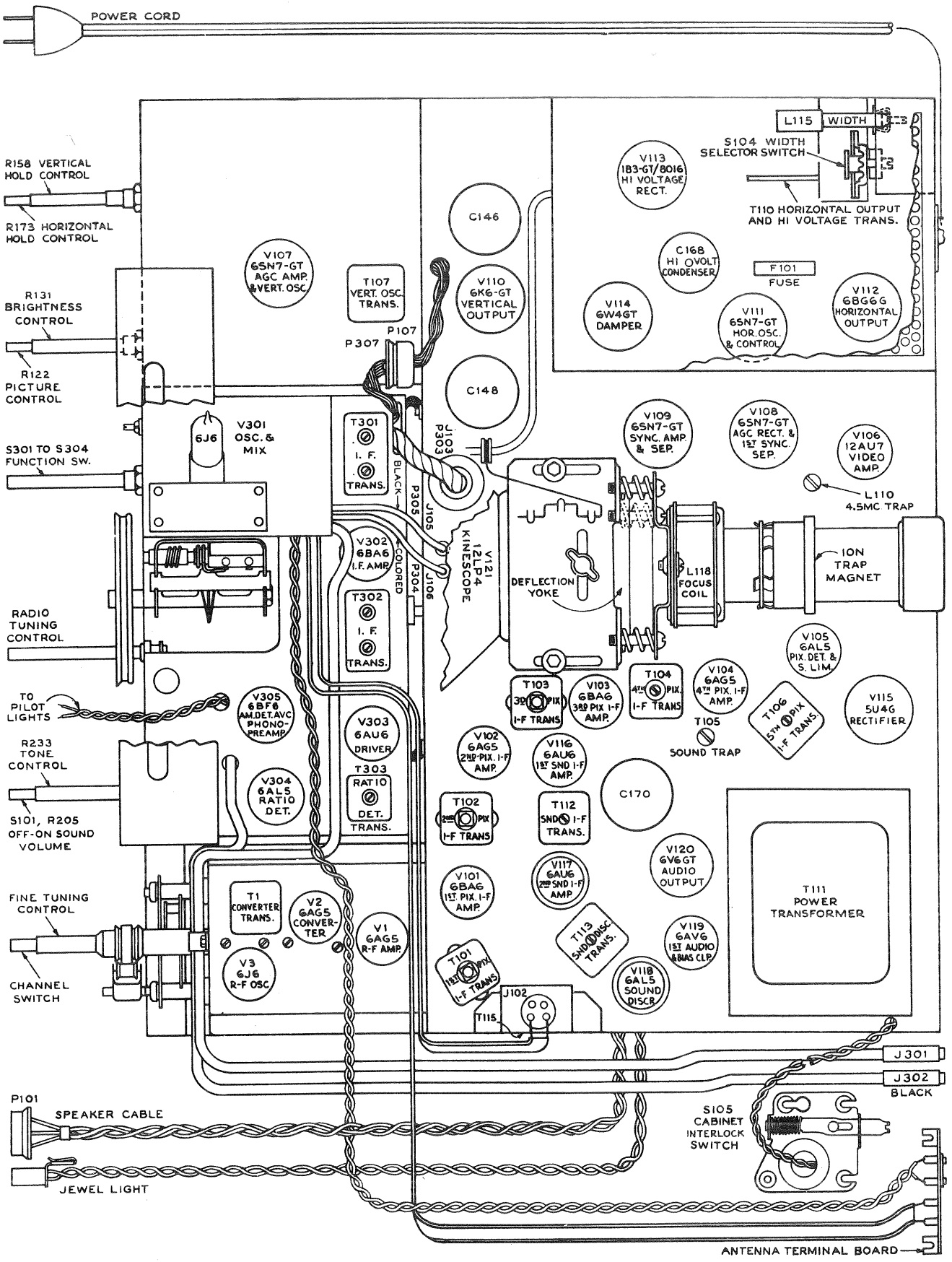


Figure 6—Chassis Top View

CHASSIS BOTTOM VIEW TA128

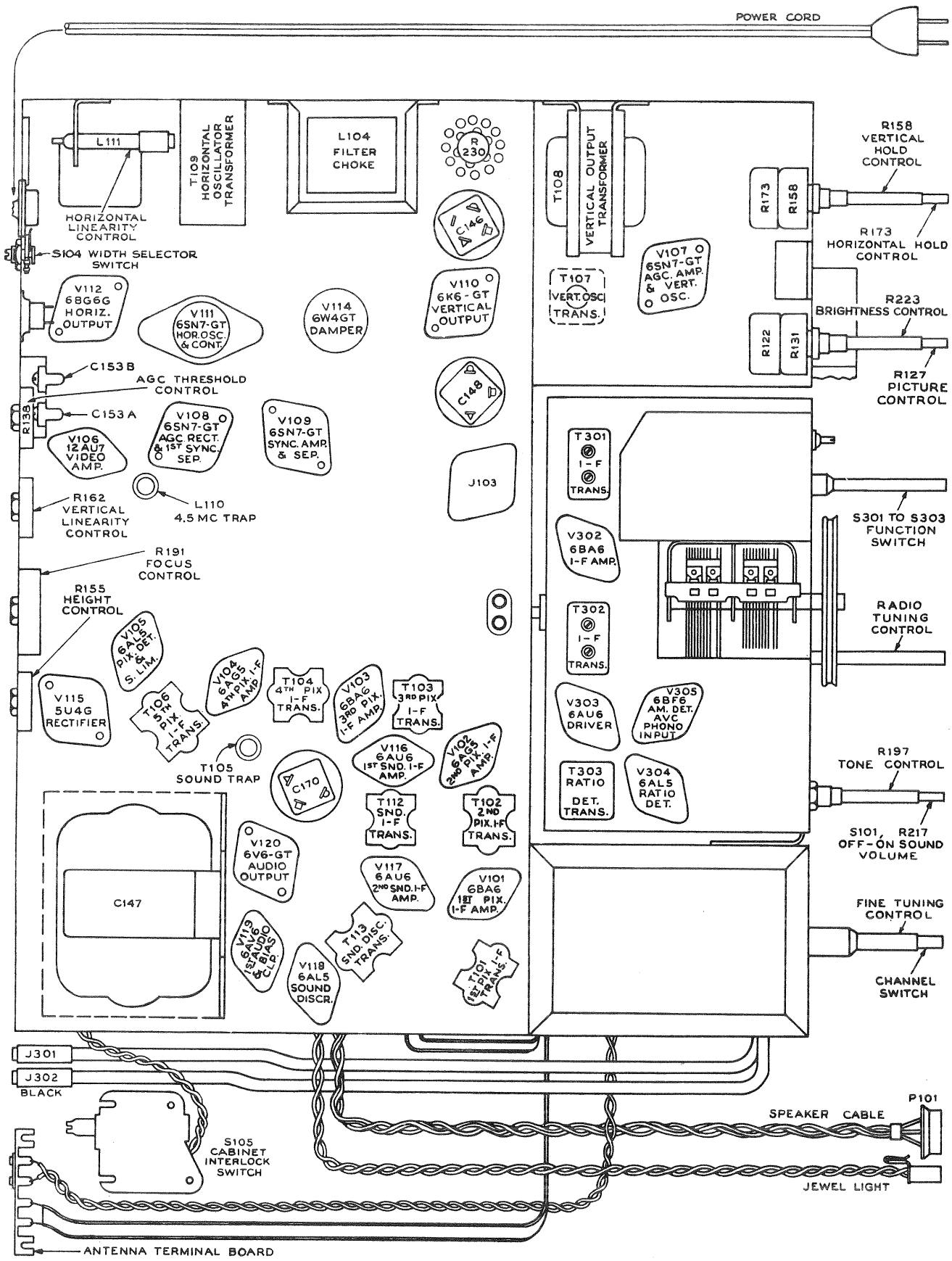


Figure 7—Chassis Bottom View

TA128

VOLTAGE CHART

The following measurements represent two sets of conditions. In the first condition a 2200 microvolt test pattern signal was fed into the receiver, the picture was synced and the AGC threshold control was properly adjusted. The second condition was obtained by removing the antenna leads and short-circuiting the receiver antenna terminals. Voltages shown are as read with "Jr. VoltOhmyst" between the indicated terminal and chassis ground and with the receiver operating on 117 volts, 60 cycles a-c.

Tube No.	Tube Type	Function	Operating Condition	E. Plate		E. Screen		E. Cathode		E. Grid		I Plate (ma.)	I Screen (ma.)	Notes on Measurements
				Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts			
V1	6AG5	R-F Amplifier	2200 Mu. V. Signal	5	140	6	142	2 & 7	0	1	–2.4	5	2	
			No Signal	5	67	6	111	2 & 7	0	1	–.4	14.0	5.0	
V2	6AG5	Converter	2200 Mu. V. Signal	5	*130 to 140	6	*130 to 140	2 & 7	0	1	*–3.0 to –7.0	*7.1 to 7.7	*2.3 to 2.7	*Depending upon channel
			No Signal	5	*104 to 109	6	*104 to 109	2 & 7	0	1	*–2.0 to –6.0	*5.3 to 5.9	*.8 to 1.0	
V3	6J6	R-F Oscillator	2200 Mu. V. Signal	1 & 2	*88 to 95	—	—	7	.19	5 & 6	*–5.1 to –7.3	*1.9 to 2.7	—	*Depending upon channel
			No Signal	1 & 2	*68 to 81	—	—	7	.16	5 & 6	*–4.5 to –6.6	*1.8 to 2.1	—	
V101	6BA6	1st Pix. I-F Amplifier	2200 Mu. V. Signal	5	125	6	125	7	.4	1	–12.5	2.8	1.3	
			No Signal	5	95	6	95	7	1.1	1	+.3	7.5	3.5	
V102	6AG5	2nd Pix. I-F Amplifier	2200 Mu. V. Signal	5	115	6	115	2 & 7	.75	1	0	8.2	2.5	
			No Signal	5	100	6	100	2 & 7	.65	1	0	6.8	2.1	
V103	6BA6	3d Pix. I-F Amplifier	2200 Mu. V. Signal	5	110	6	135	7	.25	1	–2.4	4.0	3.8	
			No Signal	5	60	6	100	2 & 7	.75	1	–.4	11.0	4.8	
V104	6AG5	4th Pix. I-F Amplifier	2200 Mu. V. Signal	5	170	6	135	2 & 7	1.35	1	0	6.5	2.0	
			No Signal	5	175	6	120	2 & 7	1.2	1	0	5.9	1.8	
V105 A	6AL5	Picture 2d Det.	2200 Mu. V. Signal	7	–113	—	—	1	–112	—	—	.48	—	
			No Signal	7	–120	—	—	1	–120	—	—	—	—	
V105 B	6AL5	Sync Limiter	2200 Mu. V. Signal	2	–107	—	—	5	–56	—	—	—	—	
			No Signal	2	–80	—	—	5	–60	—	—	—	—	
V106	12AU7	1st Video Amplifier	2200 Mu. V. Signal	1	–23.2	—	—	3	–111	2	–113	4.38	—	
			No Signal	1	–19.2	—	—	3	–117	2	–120	3.82	—	
V106	12AU7	2d Video Amplifier	2200 Mu. V. Signal	6	*166	—	—	8	*–5.3	7	*–12.2	6.2	—	*At average contrast
			No Signal	6	*134	—	—	8	*–5.6	7	*–10.3	6.9	—	
V107 A	6SN7 GT	AGC Amplifier	2200 Mu. V. Signal	5	–12.6	—	—	6	–55.5	4	–56.5	.9	—	
			No Signal	5	+.3	—	—	6	–60	4	–64	.3	—	
V107 B	6SN7 GT	Vertical Oscillator	2200 Mu. V. Signal	2	76	—	—	3	–111	1	–158	.2	—	
			No Signal	2	62	—	—	3	–120	1	–169	.2	—	
V108	6SN7 GT	AGC Rectifier	2200 Mu. V. Signal	5	97	—	—	6	–3.4	4	–19.3	.3	—	
			No Signal	5	81	—	—	6	–8.7	4	–19.3	.28	—	
V108	6SN7 GT	1st Sync Separator	2200 Mu. V. Signal	2	96	—		3	–1.8	1	–19.5	.1	—	
			No Signal	2	81	—	—	3	–9.7	1	–19.3	.1	—	
V109	6SN7 GT	Sync Amplifier	2200 Mu. V. Signal	2	158	—	—	3	0	1	–4.7	5.25	—	
			No Signal	2	154	—	—	3	0	1	–5.2	3.75	—	

VOLTAGE CHART

Tube No.	Tube Type	Function	Operating Condition	E. Plate		E. Screen		E. Cathode		E. Grid		I Plate (ma.)	I Screen (ma.)	Notes on Measurements
				Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts			
V109	6SN7 GT	Sync Separator	2200 Mu. V. Signal	5	230	—	—	6	–51	4	–106	.4	—	
			No Signal	5	215	—	—	6	–59	4	–80	.35	—	
V110	6K6-GT	Vertical Output	2200 Mu. V. Signal	3	223	4	223	8	–67	5	–91		*7.85	*Screen connected to plate
			No Signal	3	208	4	208	8	–79	5	–101		*7.7	
V111	6SN7 GT	Horizontal Osc. Control	2200 Mu. V. Signal	2	*48	—	—	3	–110	1	–92	.2	—	*Variation of hold gives –21.9 to +56 volts on plate
			No Signal	2	*33	—	—	3	–120	1	–108	.2	—	
V111	6SN7 GT	Horizontal Oscillator	2200 Mu. V. Signal	5	70	—	—	6	–111	4	–185	2.4	—	
			No Signal	5	54	—	—	6	–120	4	–192	2.4	—	
V112	6BG6G	Horizontal Output	2200 Mu. V. Signal	Cap	Do Not Meas.	8	180	3	–90	5	–110	72	9.4	
			No Signal	Cap	Do Not Meas.	8	170	3	–100	5	–115	70	9.2	
V113	1B3GT /8016	H. V. Rectifier	Brightness Min.	Cap	Do Not Meas.	—	—	2 & 7	10,500	—	—	0	—	
			Brightness Average	Cap	Do Not Meas.	—	—	2 & 7	10,000	—	—	.1	—	
V114	6W4GT	Damper	2200 Mu. V. Signal	5	Do Not Meas.	—	—	3	306	—	—	66	—	
			No Signal	5	Do Not Meas.	—	—	3	295	—	—	65	—	
V115	5U4G	Rectifier	2200 Mu. V. Signal	4 & 6	335			2 & 8	250	—	—	210	—	*A-C measured from plate to trans. center tap
			No Signal	4 & 6	335			2 & 8	245	—	—	215	—	
V116	6AU6	1st Sound I-F Amplifier	2200 Mu. V. Signal	5	134	6	134	7	.9	1	–.5	8.2	3.3	
			No Signal	5	110	6	110	7	.7	1	–.5	5.7	2.6	
V117	6AU6	2nd Sound I-F Amplifier	2200 Mu. V. Signal	5	148	6	90	7	0	1	–9	1.6	.8	
			No Signal	5	115	6	60	7	0	1	–.65	3.35	1.15	
V118	6AL5	Sound Discrim.	2200 Mu. V. Signal	2	–8.4	—	—	5	5.8	—	—	—	—	
			No Signal	2	–2.0	—	—	5	.41	—	—	—	—	
			2200 Mu. V. Signal	7	–3.7	—	—	1	0	—	—	—	—	
			No Signal	7	–1.08	—	—	1	0	—	—	—	—	
V119	6AV6	1st Audio Amplifier	2200 Mu. V. Signal	7	85	—	—	2	0	1	–.89	.49	—	
			No Signal	7	83	—	—	2	0	1	–.89	.4	—	
V120	6V6-GT	Audio Output	2200 Mu. V. Signal	3	102	4	113	8	–99	5	–108	19.3	3.3	
			No Signal	3	72	4	80	8	–110	5	–120	18	3	
V121	12LP4	Kinescope	2200 Mu. V. Signal	Cap	*10,000	10	290	11	51	2	20	.1	—	*Average Brightness
			No Signal	Cap	*10,000	10	285	11	42	2	14	—	—	*Average Brightness
V301	6J6	Mixer and Oscillator	No Signal	1 2	110 95	— —	— —	7	0	6 5	–2.0 –5.0	— —	— —	Function switch in F-M position
V302	6BA6	Radio I-F Amplifier	No Signal	5	210	6	105	7	.8	1	–0.2	—	—	
V303	6AV6	Radio F-M Driver	No Signal	5	205	6	135	7	1.5	1	0	—	—	
V304	6AL5	Radio Ratio Det.	No Signal	2	–0.2 –0.2	—	—	1	–0.1	— —	— —	— —	— —	
V305	6BF6	A-M Det. and Phono Preamp.	No Signal	7	–0.2	—	—	2	0	—	—	—	—	

TA128

RADIO ALIGNMENT PROCEDURE

If any lead dressing is necessary, it should be done before aligning the receiver. When making a complete alignment follow the table below in sequence. If only a portion of the circuit is to be aligned select the portion required and follow with the remaining steps in the section. Any adjustments made on the 455 kc. I-F's make it necessary to adjust the 10.7 mc. I-F's.

"AM" R-F—I-F ALIGNMENT

Test-Oscillator.—For all alignment operations, connect low side of the test-osc. to the receiver chassis, and keep the osc. output as low as possible to avoid a-v-c action. **Output Meter.**—Connect the meter across the speaker voice coil, and turn the receiver volume control to max.

Steps	Connect the High Side of the Test Osc. to—	Tune Test Osc. to—	Function Switch	Turn Radio Dial to—	Adjust the following
1	Antenna terminal in series with .01 mfd.	455 kc. Modulated	AM	Low Freq. end of Dial	†Top and bot. cores of T301 and T302. (For max. voltage across voice coil.)
2	Ant. terminal through dummy ant. of 200 mmfs.	1,620 kc.	AM	Min. capacity	Osc. C308 for maximum output.
3		1,400 kc.	AM	Tune to signal	Ant. C304 for maximum output.
4		600 kc.	AM	600 kc.	Osc. L306 and Ant. L303.
5	Repeat steps 2, 3 and 4 for maximum output.				

† Use alternate loading. Connect an 18,000-ohm resistor across the primary to load the plate winding while the grid winding of the same transformer is being peaked. Then load the grid winding with the 18,000-ohm resistor while the plate winding is being peaked.

RATIO DETECTOR ALIGNMENT

Connect probe of "VoltOhmyst" to negative side of C328 and low side to chassis. Connect output meter across speaker voice coil.

Steps	Connect the High Side of the Test Osc. to—	Tune Test Osc. to—	Function Switch	Radio Dial Tuned to—	Adjust
6	Pin No. 1 of 6AU6 (V303) in series with .01 mfd.	10.7 mc. 30% AM Modulated	FM	———	Top of T303 for maximum DC on "VoltOhmyst."
7	Pin No. 1 of 6AU6 (V303) in series with .01 mfd.		FM	———	Bottom of T303 for minimum audio output on meter.
8	Repeat steps 6 and 7 as necessary making final adjustment with r-f input level set to give approximately –3.0 volts d-c on "VoltOhmyst."				

"FM" R-F—I-F ALIGNMENT

Steps	Connect the High Side of the Test Osc. to—	Tune Test Osc. to—	Function Switch	Radio Dial Tuned to—	Adjust
9	Terminal 3 of S301-2 rear through 270 ohms.	10.7 mc.	FM	88 mc.	*T301 and T302 for max. with r-f input set to give –3 volts on "VoltOhmyst."
10	Terminal 3 of S301-2 rear through 270 ohms.	106 mc.	FM	106 mc.	Set C302 to max. capacity. Squeeze L307 and adjust C302 for maximum.
11	Terminal 3 of S301-2 rear through 270 ohms.	90 mc.	FM	Tune to signal	Squeeze L301 and rock gang for maximum output.
12	Repeat steps 10 and 11 as required.				

* Use a 680-ohm resistor to load the plate winding while the grid winding of the same transformer is being peaked. Then the grid winding is loaded with 680-ohm resistor while the plate winding is being peaked.

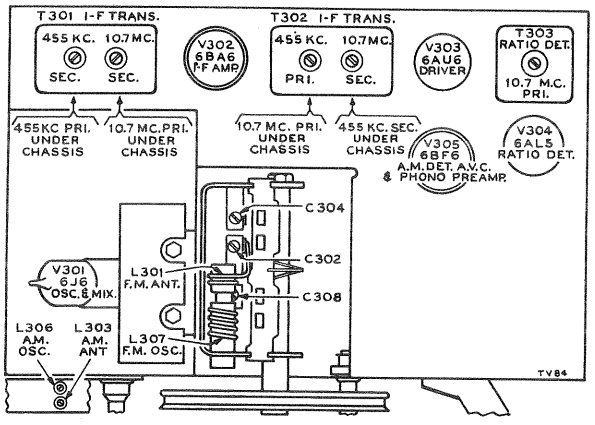


Figure 8—Chassis, Top View, Showing Adjustments

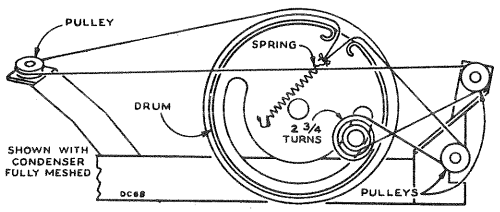


Figure 9—Dial and Drive Cord Assembly

CRITICAL LEAD DRESS:

1. Ground lead on pin 2 of V302 and V303 should be dressed down flat on chassis.
2. Dual .005 mfd. capacitors and diode filter should be dressed to clear the bottom of the cabinet.
3. Dress C329 across V302 sockets with short and direct leads.
4. Dress V302 plate lead from pin 5 down to the chassis.
5. Dress AVC lead from R321 to switch down to chassis and against back of gang mounting plate.
6. Dress lead from pin 6 of V305 down to chassis and against back of gang mounting plate.
7. Dress AVC lead from 1st I-F to switch against chassis and against gang mounting plate.
8. Dress lead from switch to pin 1 of V301 against plate supporting gang.
9. Dress all insulated F-M leads down to chassis.
10. Connect C309 with short lead to pin 6 of V301 keeping body of cap away from plate lead and switch terminals.
11. The coupling between L301 and L307 should be adjusted to give proper injection voltage to the mixer grid. This has been found to be correct when the distance between adjacent end turns is $\frac{3}{8}$" to $\frac{7}{16}$" measured at top of the form.
12. Dress cabled leads away from antenna transmission lines.
13. Dress all uninsulated bus wire so as to avoid short circuits.

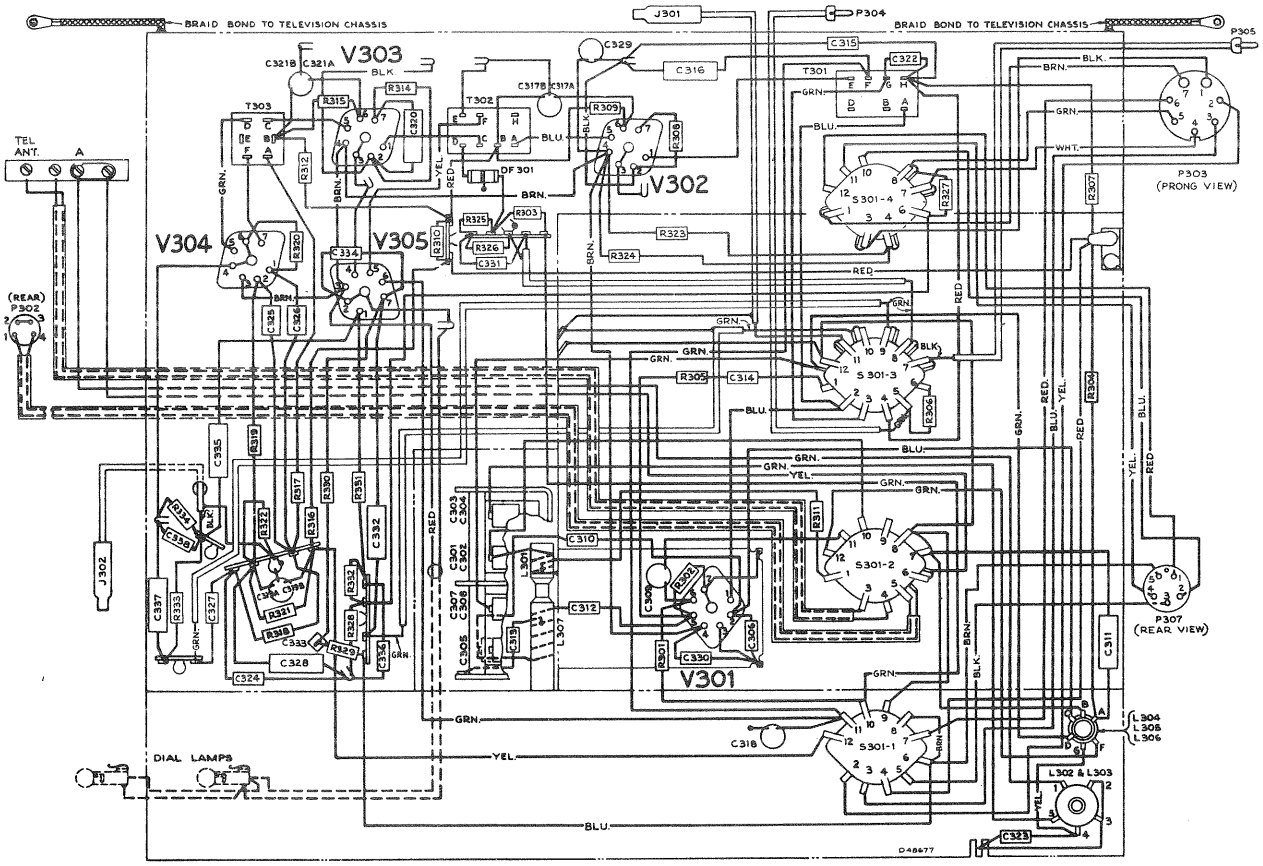


Figure 10—Radio Chassis Wiring Diagram (RK135D)

THE TELEVISION SECTION OF THE CHASSIS USED IN MODEL TA128 IS SIMILAR TO THE CHASSIS OF MODELS T120 AND T121.

REFER TO T120, T121 SERVICE DATA ON PAGES 199 TO 210 INCLUSIVE FOR TELEVISION ALIGNMENT PROCEDURE, TEST PATTERN PHOTOGRAPHS, RESPONSE CURVES AND WAVEFORM PHOTOGRAPHS.

R-F UNIT WIRING DIAGRAM

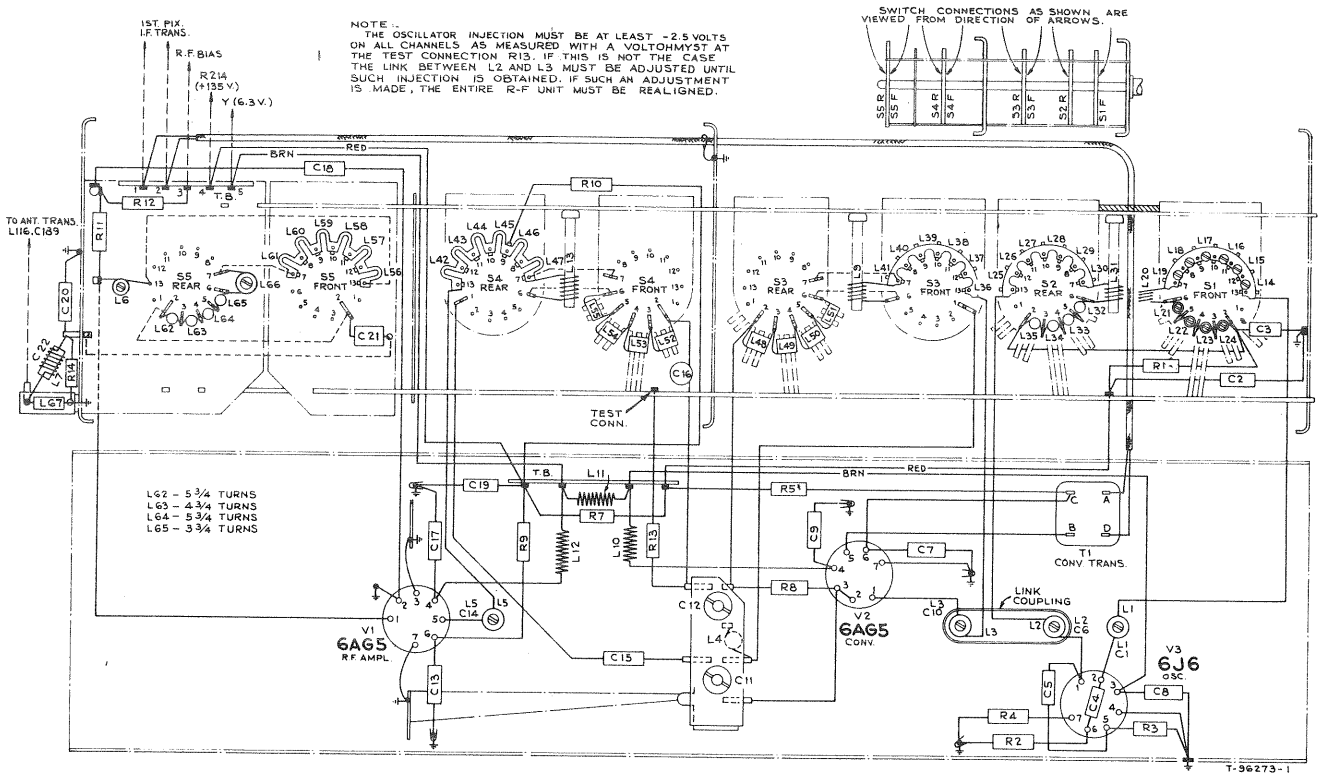


Figure 11—R-F Unit Wiring Diagram

TELEVISION CRITICAL LEAD DRESS

1. The ground bus from pin 2 and the center shield of V117 socket should not be shortened or rerouted.
2. Do not change the dress of the filament leads or the by-pass capacitors in the picture or sound i-f circuits. The filament leads between V117, V118 and V119 should be down against the chassis and away from grid or plate leads.
3. If it is necessary to replace any of the 1500 mmf capacitors in the picture i-f circuit, the lead length must be kept as short as possible.
4. Picture i-f coupling capacitors C106, C111, C115 and C121 should be up and away from the chassis and should be clear of the pix i-f transformer adjustments by at least ¼ inch. If the dress of any of these capacitors is changed, the i-f alignment should be rechecked.
5. Leads to L102 and L103 must be as short as possible.
6. Dress peaking coils L105, L106 and L107 up and away from the chassis.
7. Dress C183 across tube pins 5 and 6 with leads not exceeding ⅜ inch.
8. Dress C129 and C130 up and away from the chassis.
9. Dress the yellow lead from the picture control away from the chassis and away from the volume-control leads. Dress the yellow lead from pin 8 of V106 away from the chassis.
10. Dress the green lead from pin 2 of V106 away from the chassis.
11. Dress R168, R169, R170, R176 and R178 up and away from the chassis.
12. The leads to the volume control should be dressed down against the chassis and away from V117 and V118.
13. Contact between the i-f oscillator frequency adjustment screws and the oscillator coils or channel switch eyelets must be avoided.
14. Dress leads from L110 (width control coil) away from the transformer frame.
15. Dress T110 winding leads as shown in Figure 12.

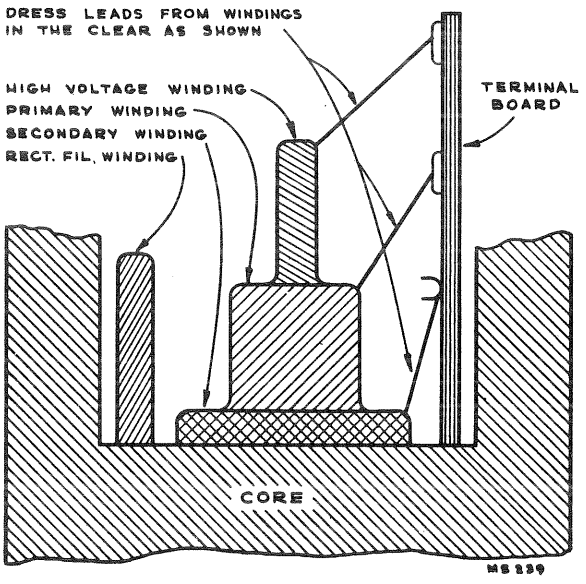


Figure 12—T110 Lead Dress