

MODEL TRK-5,
CHASSIS KC-3A

RADIO CORP. OF AMERICA

MODEL TT-5,
CHASSIS KC-3

Operation Model TRK-5

The power-volume control on the broadcast radio receiver turns on the power for the complete receiver. Pushing the button marked "Television" on the push button panel turns on the Television receiver, if the above power control is "On." The volume control of the broadcast receiver also controls the Television sound volume level.

Station Selector and Fine Tuning.—The outer ring "O" section of the central dual control knob on the Television panel selects the station from which it is desired to receive television transmission.

Five television channels are covered as follows:

- (1) 84 to 90 M.C.
- (2) 78 to 84 M.C.
- (3) 66 to 72 M.C.
- (4) 50 to 56 M.C.
- (5) 44 to 50 M.C.

Set the station selector to the number corresponding to the frequency of the station from which it is desired to receive Television Broadcasts.

The inner section "I" of this knob is used for fine tuning and may eliminate moving ripples or distortion if due to interfering radio signals. A slight inward pressure must be exerted on the knob while turning.

Before the Television portion of the receiver is turned "ON" it is advisable to turn the Brightness and Contrast controls completely counter-clockwise to reduce the illumination of the spot which appears on the Kinescope before the sweep circuits have started functioning.

Contrast and Brightness Controls.—The inner "I" section of the "Contrast" "Brightness" controls is the "Contrast" control and varies the black and white tones of the picture being received. Too little contrast makes the picture all half-tones or grays. Turning clockwise increases contrast from grays, to black and white.

The outer ring "O" is the Brightness Control and affects the average illumination of the picture. Turning clockwise increases the brightness.

Hold Controls.—The dual knobs on the Television panel marked "Horizontal" and "Vertical" Hold, control the picture stability. The inner section designated by a "I" is the Horizontal Hold Control and when being set should be turned slowly to the point at which the picture "locks in" horizontally.

The outer ring section designated by "O" is the Vertical Hold Control and when being set should be turned to the point where the picture "locks in" vertically.

These two controls on this dual knob should not ordinarily require readjustment after good picture reception has once been obtained. An occasional resetting may be necessary due to changing to a different station, and to the gradual ageing of the tubes.

Focus Control.—This control is located on the rear of the Video chassis, and controls the electron beam focus of the Kinescope. Ordinarily, after once being focused the Kinescope should not require re-focusing for a considerable length of time.

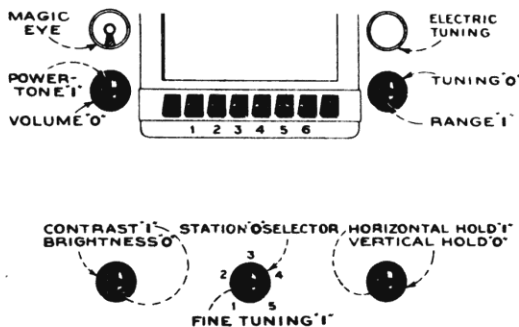


Figure 1—Control Panel Model TRK-5

Operation Model TT-5

The operation of Model TT-5 is the same as that for the Model TRK-5 except that there is a separate "ON-OFF" switch, and a separate sound volume control because the broadcast radio receiver is not included in this model. When Model TT-5 is connected to a broadcast receiver for the Television sound reproduction, the broadcast receiver volume control should be turned to maximum and the Television sound volume controlled with the control on the Television Receiver.

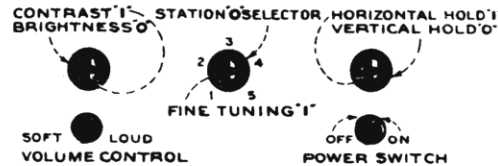


Figure 2—Control Panel Model TT-5

SERVICE DATA

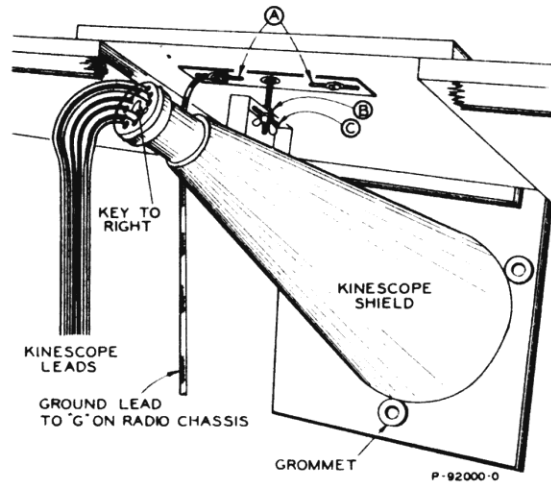


Figure 3—Kinescope Installation

Kinescope Installation Models TRK-5, TT-5: Refer to figure 3.

1. Remove back cover from cabinet.
2. Remove Kinescope mounting shield from shipping carton.
3. Using gloves and goggles remove Kinescope from shipping carton and place in the cone-shaped mounting shield.
4. Guide the Kinescope and mounting shield carefully into the cabinet, placing the Kinescope firmly up against the mask and viewing window. Fasten the mounting shield firmly in place with the thumb screw provided, so that it holds the Kinescope firmly against the mask. If the Kinescope does not line up properly with the mask, loosen the screws "A" and nut "B" and adjust in the direction desired.
5. After the receiver is operating, the Kinescope may be rotated to properly square up the picture with the mask.

CAUTION: When rotating tube the power should be turned "OFF."

Adjustments.—There are a series of screwdriver slot adjustments at the rear of the Video chassis used to obtain the proper picture size and centering. These adjustments are explained fully in the receiver operating instructions.

When the receiver is moved from one location to another, some readjustment of these controls may be necessary.

MODEL TRK-5,
CHASSIS KC-3A
MODEL TT-5,
CHASSIS KC-3

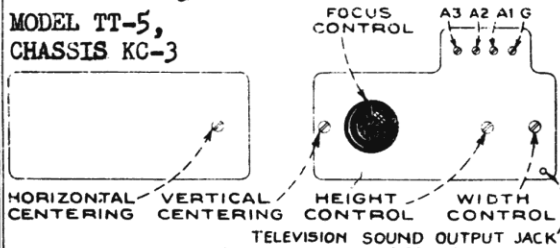


Figure 4—Adjustments at Rear of Chassis

**Video Chassis KC-3 (TT-5)
KC-3A (TRK-5)**

No attempt should ever be made to measure the high (2,000 volts) voltage, because of the dangers and difficulties involved. If at any time it becomes necessary to service the high voltage circuit, the suspected parts should be replaced by parts known to be in good operating condition.

Always replace the red cap over the 879 high voltage rectifier.

The most dangerous portion of the receiver is the plate (top cap) lead for the 879 high voltage rectifier. Always be very careful when working near or with this lead.

When working on the high voltage supply portion of this chassis, the following precautions should be observed:

1. Remove power supply cord from the power supply socket.
2. Use only one hand at a time.
3. Connect a shorting lead between ground (firstly) and to the high voltage side.
4. Whenever working with the oil-filled high voltage filter capacitors, keep a constant short across the capacitor, as these capacitors do not completely lose their charge after being discharged a single or several subsequent times.
5. Only one person at a time should work on the unit to prevent any misunderstanding which may result in an accident.

When any changes are made on the Video portion of the chassis, the locations of leads and parts should be returned as closely as possible to their original positions.

Service Hints:

1. In some cases the horizontal sweep oscillator circuit will radiate energy to nearby broadcast receiving antennas and lead-ins, causing interference with standard broadcast receivers. It has been found that this trouble has been cleared up in some cases by use of an RCA "Magic Wave" antenna for the broadcast receiver receiving the interference.
2. If the picture "tears out" when the receiver is jarred it may be due to microphonic 1852, 1853, or 6J5 tubes.
3. The 6J5 oscillator tube should be removed without rocking it in its socket to loosen it, as the motion may cause the 80.5 mmf capacitor C16 to break off.
4. The coils or straps in the h.f. oscillator circuits should not be touched or moved or the alignment of the receiver will be disturbed.
5. The two Video coupling capacitors C44, 45, should be kept clear of chassis.
6. In some cases the metal Kinescope mounting shield may become magnetized by the earth's or some nearby magnetic field, and thus distort the picture on the screen towards the magnetized portion of the shield. The shield can be demagnetized by passing it slowly through a solenoid which is energized by an a-c current.

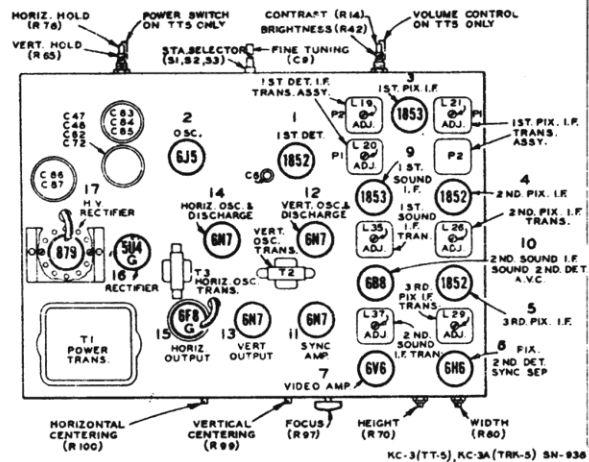


Figure 5—Top View Television Chassis

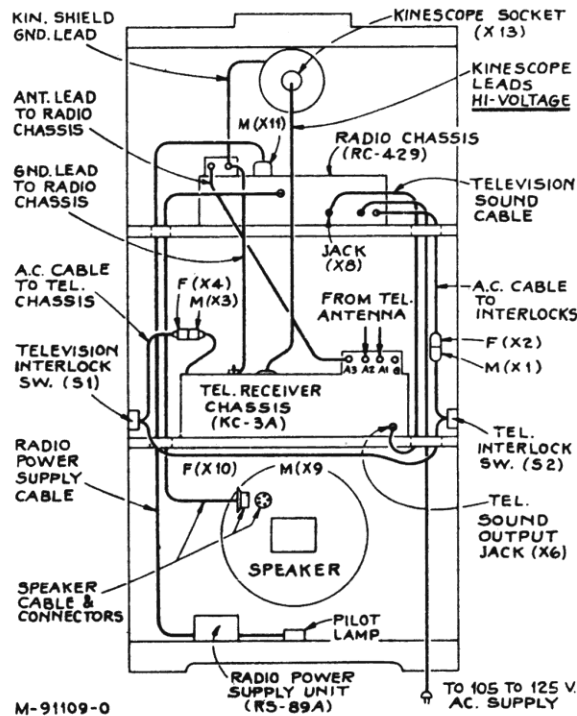


Figure 6—Rear View Model TRK-5

Antenna

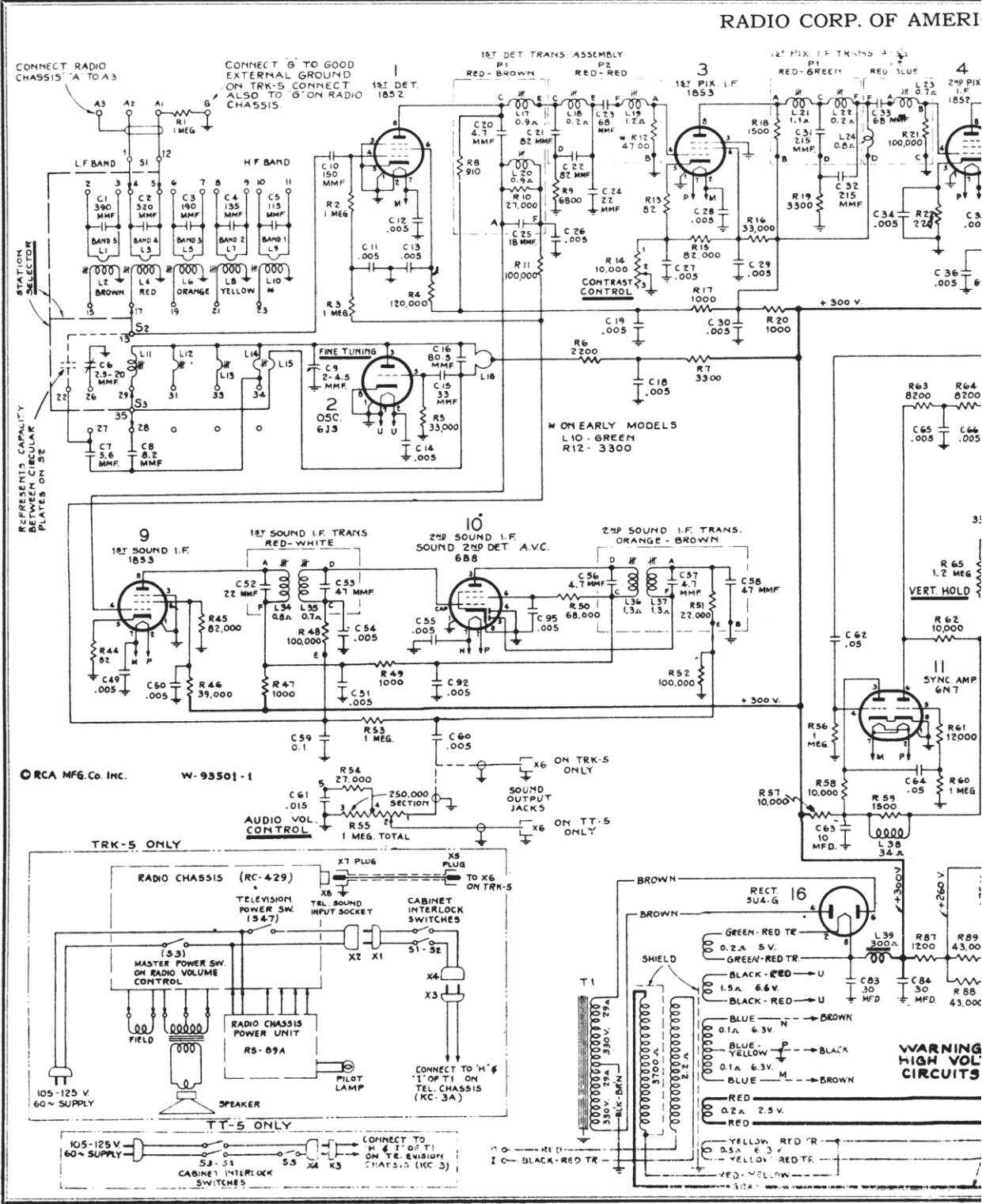
The finest television receiver built may be said to be only as good as the antenna design and installation. It is therefore important to use a correctly designed antenna, and use care in its installation.

The RCA Double Dipole Antenna, Stock No. 9871, is recommended for use with these receivers. Both this antenna and the "V" antenna described below are especially designed for a sufficient broad frequency response to cover the contemplated television spectrum with good efficiency and are therefore superior to a single Dipole type antenna.

When greater signal pickup, or where a shielding effect from noise pickup or image reflections are desired, a reflector assembly Stock No. 9872 may be added to the Stock No. 9871 Antenna to obtain an improved signal-to-noise ratio.

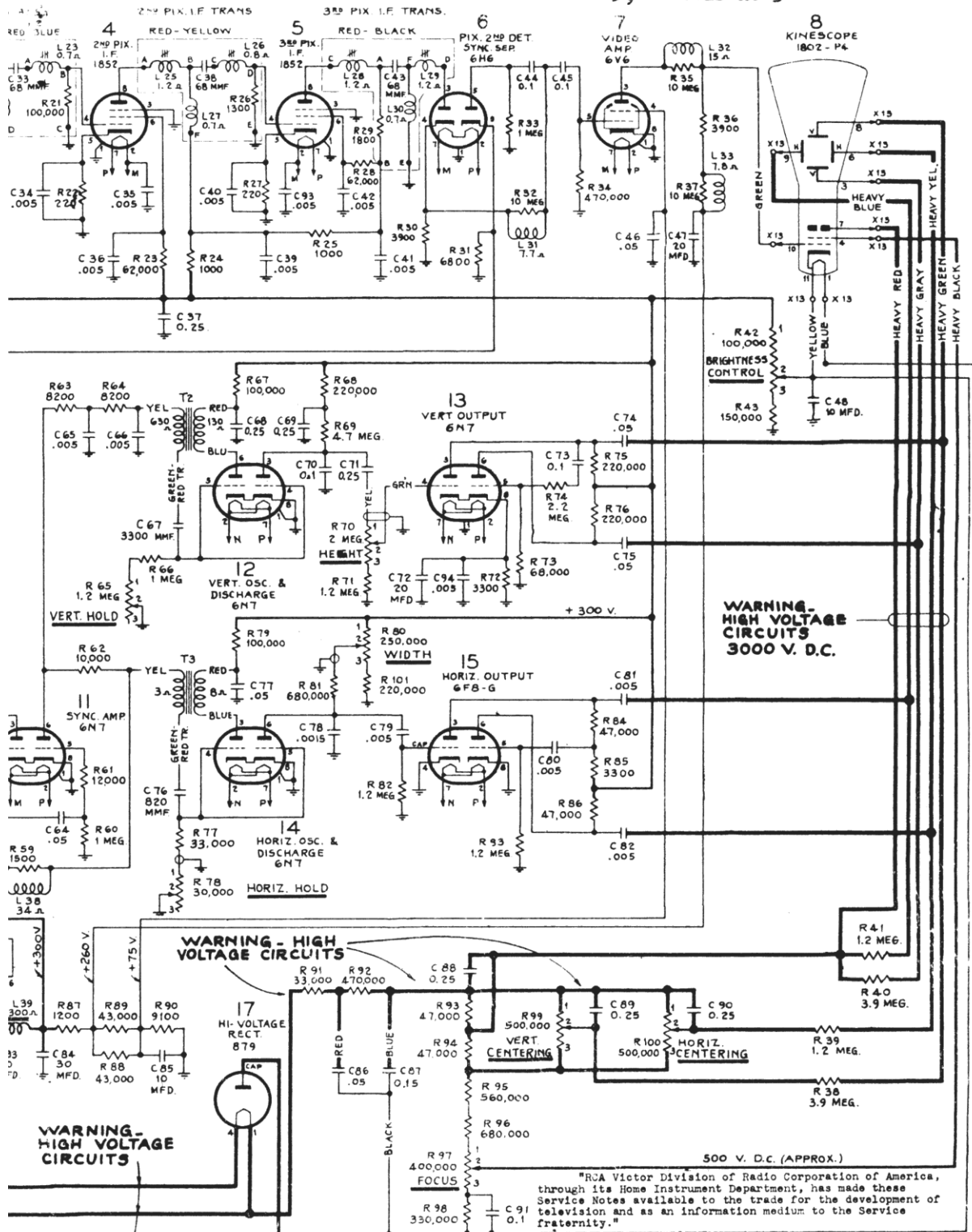
The RCA Double "V" Wire type Television Antenna is alternative type of antenna designed for television sight and sound reception. Two points of support are necessary. It serves adequately in suburban areas but may not be sufficiently flexible and efficient for congested city areas where bad reflections and interference are encountered.

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MODEL TRK-5, CHASSIS KC-3A, RC-429, RS-89A
 MODEL TT-5, CHASSIS KC-3



WARNING - HIGH VOLTAGE CIRCUITS 3000 V. D.C.

WARNING - HIGH VOLTAGE CIRCUITS

WARNING - HIGH VOLTAGE CIRCUITS

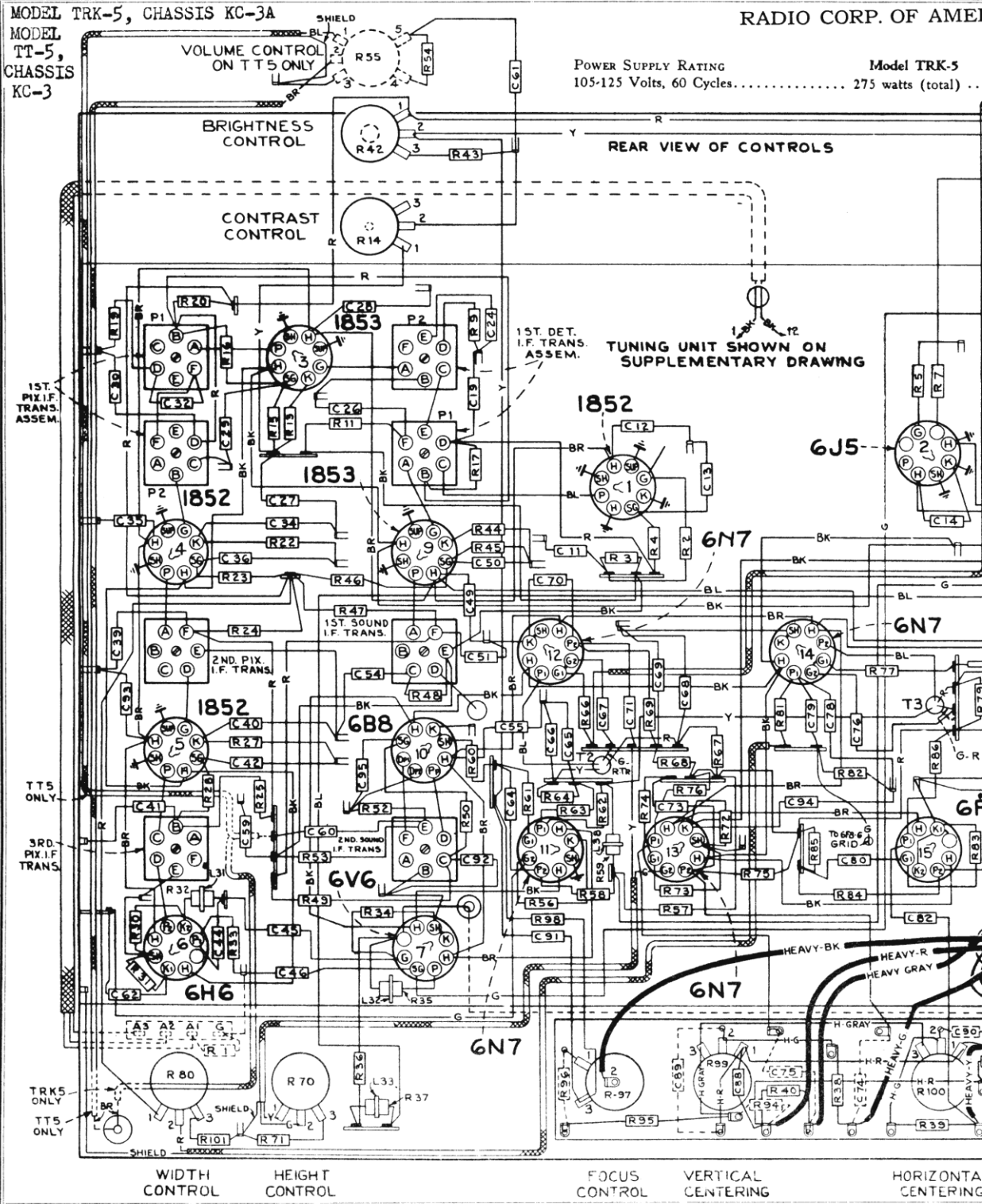
"RCA Victor Division of Radio Corporation of America, through its Home Instrument Department, has made these Service Notes available to the trade for the development of television and as an information medium to the Service fraternity."

Figure 8--Schematic Diagram Television Chassis — 1939 No. 19 —

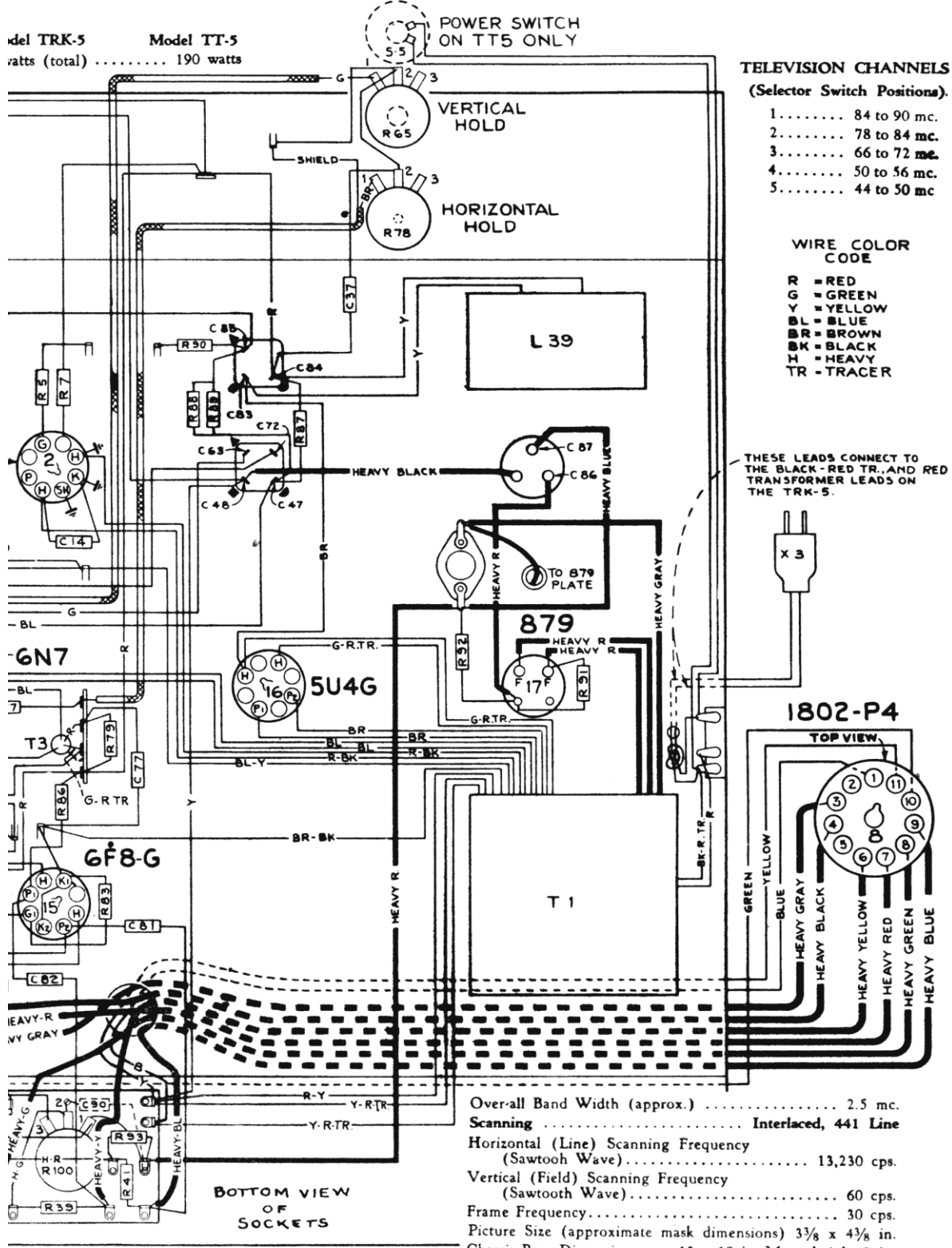
Note: In some production, R12 (in grid circuit of 1st-ix-I. F.) is 4,700 ohms

MODEL TRK-5, CHASSIS KC-3A
MODEL TT-5,
CHASSIS KC-3

POWER SUPPLY RATING
105-125 Volts, 60 Cycles..... 275 watts (total) ..



Model TRK-5 Model TT-5
watts (total) 190 watts



TELEVISION CHANNELS
(Selector Switch Positions).

1.....	84 to 90 mc.
2.....	78 to 84 mc.
3.....	66 to 72 mc.
4.....	50 to 56 mc.
5.....	44 to 50 mc.

WIRE COLOR CODE

- R = RED
- G = GREEN
- Y = YELLOW
- BL = BLUE
- BR = BROWN
- BK = BLACK
- H = HEAVY
- TR = TRACER

THESE LEADS CONNECT TO THE BLACK-RED TR., AND RED TRANSFORMER LEADS ON THE TRK-5.

HORIZONTAL CENTERING

Figure 9—Wiring Diagram Television Chassis

W-93503-0

Overall Band Width (approx.) 2.5 mc.
Scanning Interlaced, 441 Line
Horizontal (Line) Scanning Frequency (Sawtooth Wave) 13,230 cps.
Vertical (Field) Scanning Frequency (Sawtooth Wave) 60 cps.
Frame Frequency 30 cps.
Picture Size (approximate mask dimensions) 3 3/8 x 4 3/8 in.
Chassis Base Dimensions 13 x 18 in. Max.; height 9 in.

RADIO CORP. OF AMERICA

MODEL TRK-5,
CHASSIS KC-3A
MODEL TT-5,
CHASSIS KC-3

Antenna Installation:

In most cases, the antenna should not be installed permanently on the apartment or residence roof until the quality of the picture reception has been observed on a Television Receiver. A temporary transmission line can be run between receiver and the antenna allowing sufficient slack to permit moving the antenna. Then, with a telephone system connecting an observer at the receiver and an assistant on the roof to find an antenna location, the antenna can be positioned to give the most satisfactory results on the received signal. A shift of only a few feet in antenna position or direction may effect a tremendous difference in picture reception. Whenever possible, the antenna location should be chosen or erected so the antenna is not only broadside to the transmitter but removed as far as possible from highways, hospitals and doctors' offices, and similar sources of interference. Auto ignition and diathermy apparatus may cause noise interference which spoils the picture.

In mounting any antenna, care must be taken to keep the antenna rods or pickup wires proper at least 1/4 wave length (at least 6 feet) away from other antennas, metal roofs and gutters or metal objects.

Under certain extremely unusual conditions, it may be possible to rotate or position the antenna so it receives the

cleanest picture over a reflected path. If such is the case, the antenna should be so positioned. However, such a position may give variable results as the nature of reflecting surfaces may vary with weather conditions, as a wet surface has been known to have different reflecting characteristics than a dry surface.

In short, a television receiving antenna and its installation must conform to much higher standards than an antenna for reception of International Short Wave and Standard Broadcast signals because:

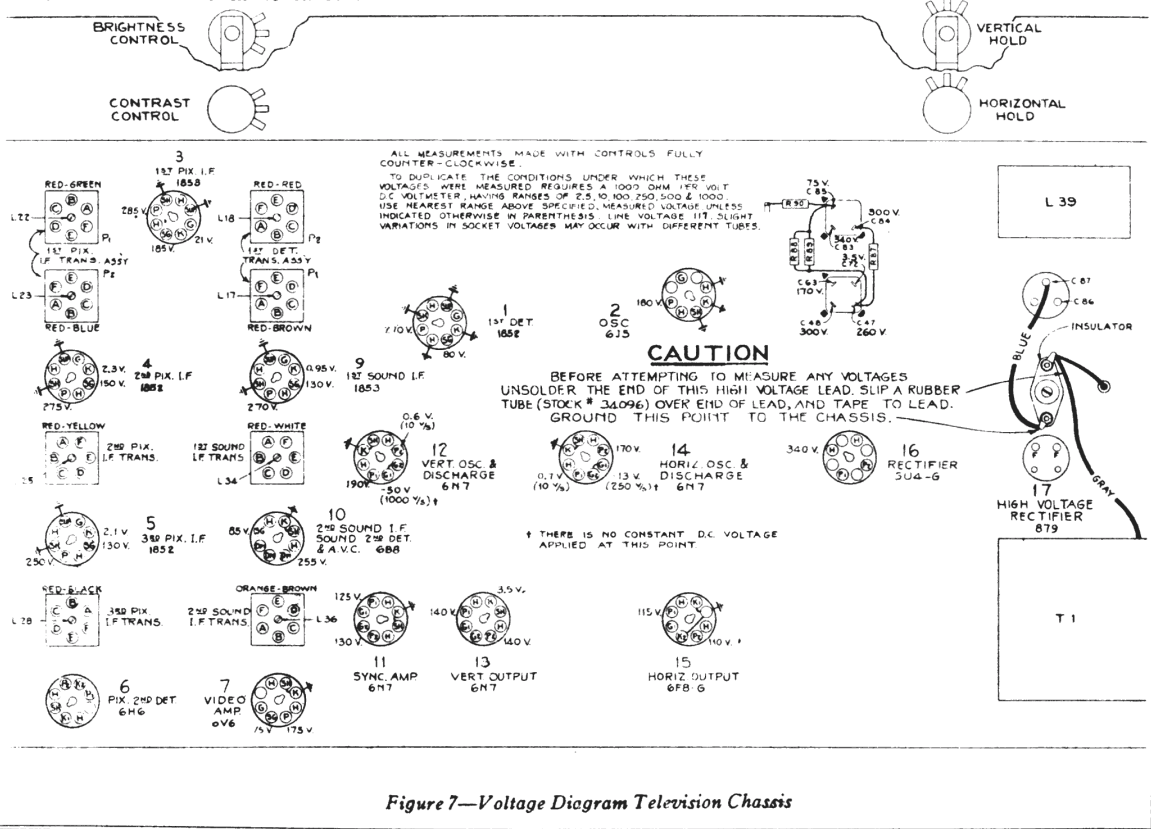
- (1) Intervening obstacles have a pronounced shielding effect on the ultra-high frequency waves producing low intensity signals. Severe trouble with multi-path transmissions may be experienced, especially in congested city areas.
- (2) The picture signal is comprised of a very wide band or range of frequencies, all of which must be received with good efficiency.
- (3) It must be continually remembered that the discernment of the eye is much more critical than that of the ear.

The Transmission Line

RCA Victor has made available two types of exterior transmission lines. One is a special low loss weather-proofed line having the correct surge impedance to match the RCA Victor Television antennas and the RCA Victor Television receivers. It is carried as Stock No. 9882 in 1,000 foot rolls. The second type is a standard weather-proofed line also having the correct surge impedance for proper antenna and receiver matching. It is carried as Stock No. 12430 in 90 ft. rolls, Stock No. 12429 in 40 ft. rolls and is available in

1,000 ft. spools as Stock No. 9881. Use of improper lines may result in excessive loss or may lead to line reflections, resulting in multiple images or "ghosts," thus marring the reception.

For transmission line runs up to 200 feet, and where the signal strength on the antenna is relatively high, the Stock No. 12430, or Stock No. 12429 transmission line may be used. For all other applications the Stock No. 9882 transmission line is recommended.



MODEL TRK-5,
CHASSIS RC-429

RADIO CORP. OF AMERICA

Electrical Specifications

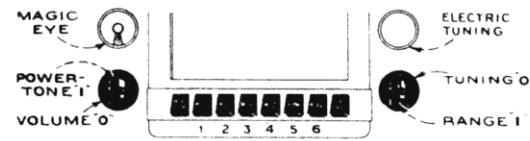
FREQUENCY RANGES	
Standard Broadcast ("A" band).....	540-1720 kc
Intermediate Frequency.....	455 kc
TUBE COMPLEMENT	
(1) RCA-6A8-G.....	1st-Det., and Osc.
(2) RCA-6K7.....	I-F Amplifier
(3) RCA-6Q7.....	2nd-Det., A.V.C., 1st Audio
(4) RCA-6J5.....	Phase Inverter
(5) RCA-6K6-G.....	Power Output
(6) RCA-6K6-G.....	Power Output
(7) RCA-6U5.....	"Magic Eye"
(8) RCA-5Y3-G (in SPU RS-89A).....	Full-Wave Rectifier
Dial Lamps.....	Mazda No. 44, 6.3 volts, .25 amp.
Power Supply Rating.....	105-125 volts, 60 cycles, 75 watts
POWER OUTPUT	
Undistorted.....	5 watts
Maximum.....	5.5 watts
ELECTRIC TUNING RANGES	
Two stations between approximately.....	550-950 kc
Two stations between approximately.....	690-1,225 kc
Two stations between approximately.....	890-1,500 kc
LOUDSPEAKER (RL-70H-5)	
Type.....	12-inch electrodynamic
Voice-Coil impedance.....	2.2 ohms at 400 cycles

Mechanical Specifications

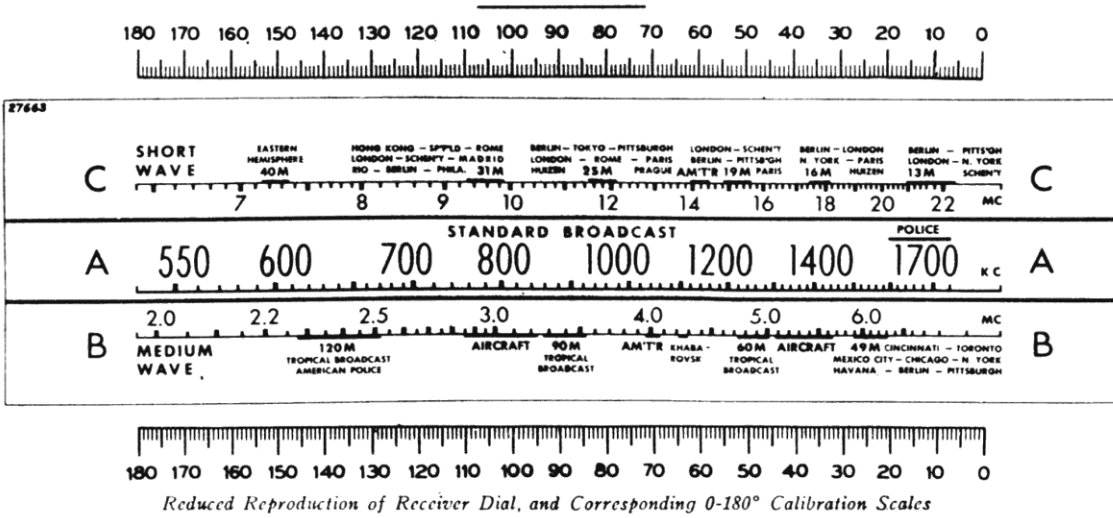
RC-429 CHASSIS BASE DIMENSIONS:	
Height.....	2-1/2 inches
Width.....	13 inches
Depth.....	6-1/2 inches
Over-all Chassis Height.....	6-1/2 inches
Tuning Drive Ratio.....	12 to 1

General Description

Radio receiver chassis No. RC-429 is used in RCA Victor Television console Model TRK-5.
The audio output of the television chassis is connected to the audio input of the RC-429 chassis by means of jack X-8 and the left-hand push-button switch (S44, S45, S46).
A separate plug-in power supply unit, RS-89A, is used to supply heater and plate voltage to the RC-427 chassis. Service data and diagrams for the power unit are contained in the following pages.



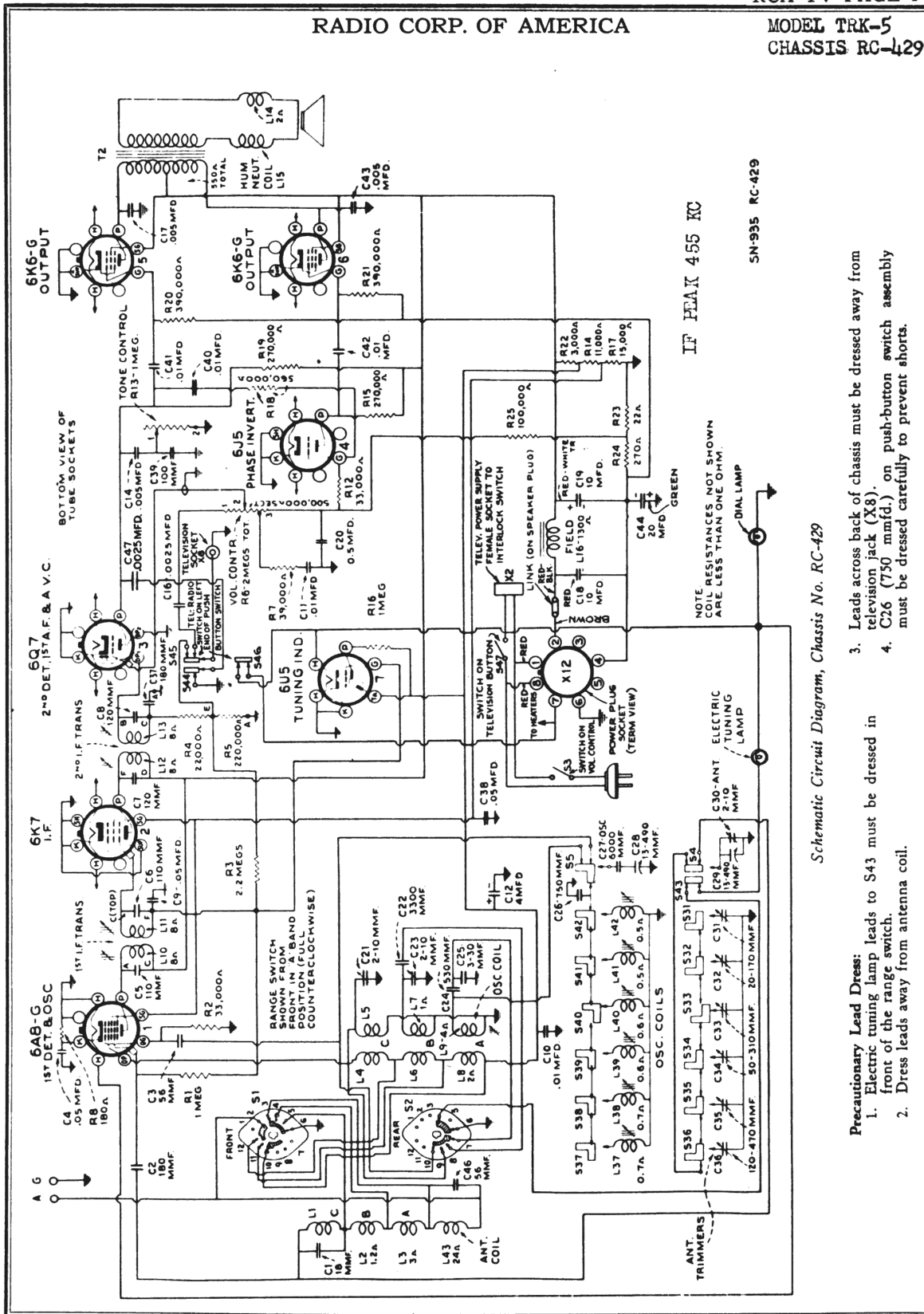
Location of Controls (Radio)



The corresponding position of the dial indicator for any setting of the calibration scale can be determined by drawing a line from this point on the bottom calibration scale to the same point on the top calibration scale. For example, 28° on the calibration scale corresponds to 1,500 kc on "A" band. Read instructions under "Alignment Procedure."

RADIO CORP. OF AMERICA

MODEL TRK-5
CHASSIS RC-429



SN-935 RC-429

IF PEAK 4.55 KC

NOTE
COIL RESISTANCES NOT SHOWN
ARE LESS THAN ONE OHM.

Schematic Circuit Diagram, Chassis No. RC-429

- Precautionary Lead Dress:**
1. Electric tuning lamp leads to S43 must be dressed in front of the range switch.
 2. Dress leads away from antenna coil.
 3. Leads across back of chassis must be dressed away from television jack (X8).
 4. C26 (750 mmfd.) on push-button switch assembly must be dressed carefully to prevent shorts.

MODEL TRK-5,
CHASSIS RC-429

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Alignment Procedure (RADIO CHASSIS)

Cathode-Ray Alignment is the preferable method. Connections for the oscillograph are shown in the chassis drawing.

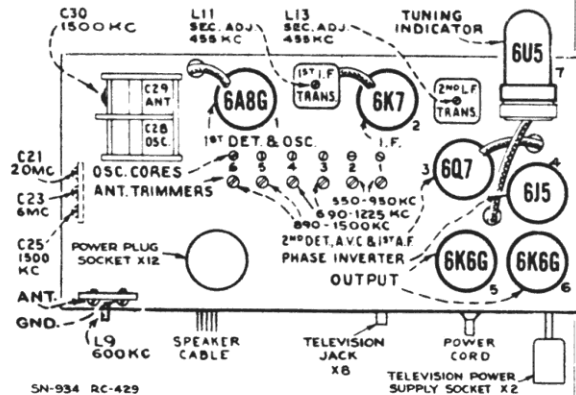
Output Meter Alignment.—If this method is used, connect the meter across the voice coil, and turn the receiver volume control to maximum.

Test-Oscillator.—For all alignment operations, connect the low side of the test-oscillator to the receiver ground terminal (G), and keep the output as low as possible to avoid a-v-c action.

Calibration Scale on Indicator-Drive-Cord Drum.—The tuning dial if fastened in the cabinet and cannot be used for reference during alignment; therefore, a calibration scale is attached to the rear of the drum which is mounted on the front shaft of the gang condenser. The setting of the gang condenser is read on this scale, which is calibrated in degrees. The correct setting of the gang in degrees, for each alignment frequency, is given in the alignment table.

As the first step in r-f alignment, check the position of the drum. The 180° mark on the drum scale must be vertical, and directly over the center of the gang-condenser shaft when the plates are fully meshed. The distance from the front of the chassis to the drum must not exceed 3/8-inch. The drum is held to the shaft by means of two set screws, which must be tightened securely when the drum is in the correct position.

Pointer for Calibration Scale.—Improvise a pointer for the calibration scale by fastening a piece of wire to the gang-



condenser frame, and bend the wire so that it points to the "180°" mark on the calibration scale when the plates are fully meshed.

Dial-Indicator Adjustment.—After fastening the chassis in the cabinet, attach the dial indicator to the drive cable with indicator at the 530 kc mark, and gang condenser fully meshed. The indicator has a spring clip for attachment to the cable.

For additional details, refer to booklet "RCA Victor Receiver Alignment."

Step	Connect the high side of test-osc. to—	Tune test-osc. to—	Turn radio dial to—	Adjust the following for max. peak output—
1	6K7 I-F grid cap, in series with .01 mfd.	455 kc	"A" band, Quiet Point between 550-750 kc	L12 and L13 (2nd I-F Trans.)
2	6A8-G 1st-Det. grid cap, in series with .01 mfd.			L10 and L11 (1st I-F Trans.)
3	Antenna terminal, in series with 200 mmfd.	600 kc	600 kc 150.5°	L9 (osc.)
4		1,500 kc	1,500 kc 28°	C25 (osc.) C30 (ant.)
5	Repeat steps 3 and 4.			
6	Antenna terminal, in series with 300 ohms	6 mc	6 mc 26.5°	C23 (osc.)*
7		20 mc	20 mc 22°	C21 (osc.)*
8	Follow "Adjustments for Electric Tuning."			

* Use minimum capacity peak if two peaks can be obtained, and check for image by tuning radio approximately 910 kc lower.
Note: The oscillator tracks above the signal on all bands.

Adjustments for Electric Tuning

These models have eight push buttons. The left-hand button is a Television switch. The right-hand button connects the gang condenser for manual tuning. The other six buttons are for electric tuning of six different stations in the standard-broadcast range. The station buttons connect to separate magnetite-core oscillator coils and separate antenna trimmers which must be adjusted for the desired stations. Use an insulated screwdriver or alignment tool such as RCA Stock No. 31031. Allow at least five minutes warm-up period before making adjustments.

The procedure is as follows:

1. Make a list of the desired six stations, arranged in order from low to high frequencies.
2. Push in the dial-tuning button, and manually tune in the first station on the list.

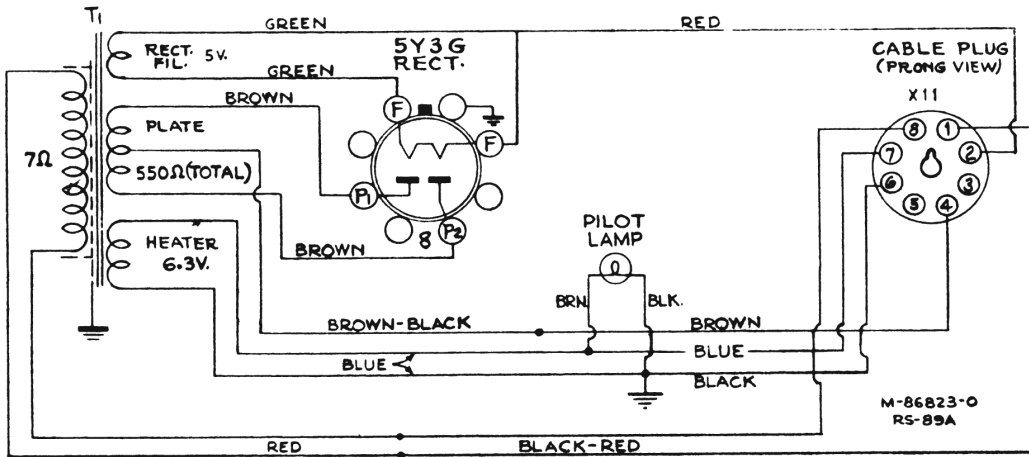
3. Push in station button No. 1 (second from left) and adjust No. 1 oscillator core (L37) to receive this station. Screw the core all the way in, to lowest frequency, and then unscrew slowly until station is received.
4. Adjust No. 1 antenna trimmer (C36) for maximum output on this station.

Clockwise adjustment of cores and trimmers tunes the circuits to lower frequencies.

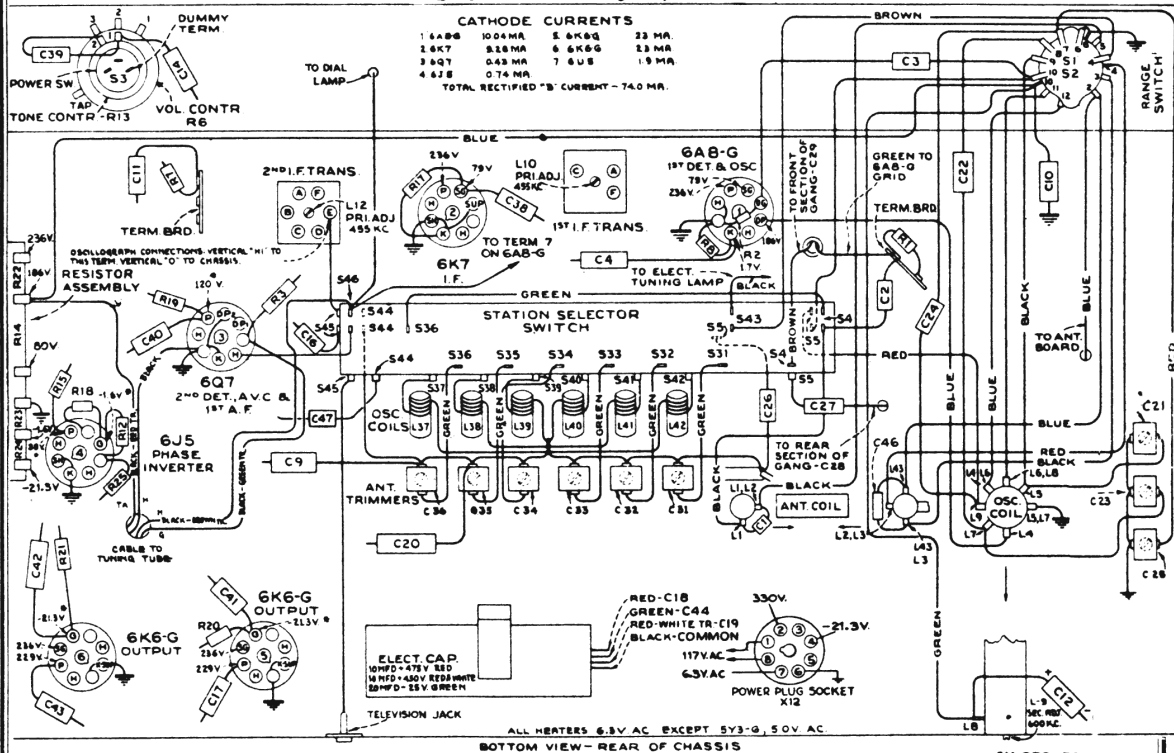
5. Adjust for each of the remaining five stations in the same manner.
6. Make a final careful adjustment of the oscillator cores and antenna trimmers. Use the "Magic Eye" to ensure sharp peaking.

RADIO CORP. OF AMERICA

MODEL TRK-5,
CHASSIS RC-429



SPU Schematic Diagram, RS-89A



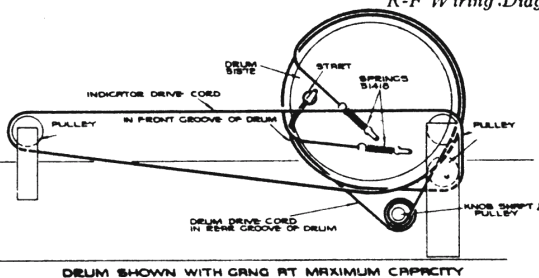
ALL HEATERS 6.3V AC EXCEPT 5Y3-G, 5.0V AC
BOTTOM VIEW - REAR OF CHASSIS

5N-936 RC-429

R-F Wiring Diagram, Chassis No. RC-429

Measurements made to chassis unless otherwise indicated, with set tuned to quiet point and volume control at minimum. Values should hold within approximately $\pm 20\%$ with 117-volt a-c supply.

NOTE: Values with star () are operating voltages in circuits with high series-resistance. The actual measured voltages will be lower, depending on the voltmeter loading.



At Left—Dial Mechanism

MODELS TRK-5, TT-5

RADIO CORP. OF AMERICA

REPLACEMENT PARTS

In list on genuine factory-tested parts, which are readily identified and may be purchased from authorized dealers.

Table with columns: STOCK No., DESCRIPTION, STOCK No., DESCRIPTION, STOCK No., DESCRIPTION. Contains a comprehensive list of electronic components such as capacitors, resistors, transformers, and various assemblies for models TRK-5 and TT-5.

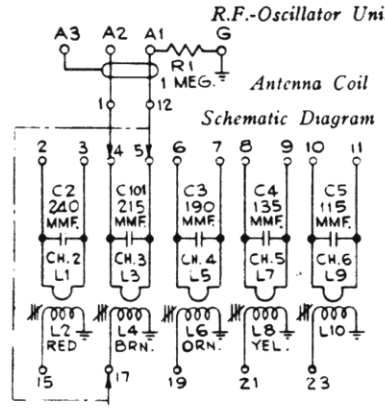
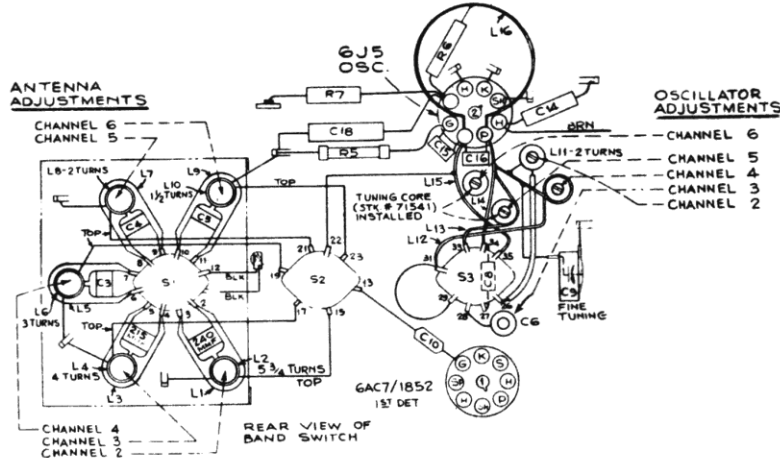
RADIO CORP. OF AMERICA
REVISION OF SERVICE DATA
MODELS TT-5, TRK-5, 9, 12, 90 AND 120

MODELS TRK-5, TRK-9,
TRK-12, TRK-90,
TRK-120, TT-5

Modifications were made to subject receivers to provide operation on 1946 Television Channels #2 through #6.

1941 Channel	1941 Channel Frequency	Old Osc. Frequency	Switch Position	1946 Channel	1946 Channel Frequency	New Osc. Frequency
#1	50-56 Mc.	64 Mc.	First	#2	54-60 Mc.	68 Mc.
#2	60-66 Mc.	74 Mc.	Second	#3	60-66 Mc.	74 Mc.
#3	66-72 Mc.	80 Mc.	Third	#4	66-72 Mc.	80 Mc.
#4	78-84 Mc.	92 Mc.	Fourth	#5	76-82 Mc.	90 Mc.
#5	84-90 Mc.	98 Mc.	Fifth	#6	82-88 Mc.	96 Mc.

A new Decalcomania was placed on the cabinet to indicate the new channels.
 A shield was placed between the 2nd Pix I.F. and the 2nd Sound I.F. in Models TRK-9, 12, 90 and 120.
 The modified antenna and oscillator circuits are shown in the diagrams below.



SLOPE DETECTION

In all of the old RCA television receivers where the sound channel was a-m, the i-f transformers were detuned so that detection of f-m signal could be attained. Due to the detuning a new response curve resulted with a fairly linear slope on the lower frequency end of the curve. The frequency at the center of this slope was the center frequency of the produced f-m i-f signal. Consequently, the incoming f-m i-f signal would be sweeping an equal amount on either side of the center of this linear slope. The sloping characteristic of this linear section of the i-f response was such that the f-m i-f signal would not deviate or sweep into the non-linear portion of the curve. By this arrangement, detection of an f-m signal is possible. This process is known as slope detection and is discussed in greater detail in the television "How it Works" book.