1. GENERAL DESCRIPTION

The Du Mont RA-103 Teleset models Chatham, Stratford, and the Savoy all use essentially the same television receiver chassis to provide excellent television and frequency modulation reception. The chassis incorporates twenty-seven vacuum tubes including rectifiers and the twelve-inch direct view Teletron* which is mounted on the chassis. The two table models, Chatham and Stratford, use the same chassis (Type 7040A1). The only difference between the Chatham and Stratford is in their cabinet design. The Stratford is easily recognized by its doors which cover the front panel. The Savoy model utilizes the Type 7040A2 television receiver chassis which differs from the Type 7040A1 chassis only in the audio amplifier characteristics. The Savoy model contains, in addition to the television receiver chassis, a separate amplitude modulation broadcast band receiver, a record changer, and a record storage compartment. A separate record player can be plugged into the table models.

The most modern scientific advances in circuit design and construction have been incorporated in the Chatham, Stratford, and the Savoy, including the following noteworthy design features: continuous coverage wide range tuning (44-216 megacycles), flywheel synchronization circuits, and flyback type of high voltage power supply.

These telesets are designed to operate from a 115 volt, 60 cycle AC power source and are so designed as to operate satisfactorily over a range of 105 to 129 volts. The power consumed when operated from a 115 volt, 60 cycle source averages 290 watts on television and 160 watts on FM. The Savoy model averages 60 watts on AM.

The Model RA-103 Telesets are capable of delivering 3 watts of undistorted audio power into the loudspeaker. The Type 12JP4 Teletron* cathode-ray tube is used on all models and provides a high quality picture, 7-1/2 inches by 10 inches in size.

The front panel controls of the RA-103 Telesets are the Focus Control, Service Selector, On-Off and Volume Control, Brightness Control, Contrast Control and Tuning Dial. The tuning of the RA-103 teleset is simplified considerably by the addition of the tuning eye indicator which is located on the front panel. The following controls are located on the rear fold of the television receiver chassis: Horizontal Drive, Vertical Hold, Vertical Linearity, Vertical Size, Horizontal Positioning, Vertical Positioning, and Vertical Positioning Switch. The Horizontal Hold Control is an adjustment at the top of the shield and can be located on top of the chassis at the rear. It is accessible through an opening in the perforated back. In addition, the Savoy Console Model has on the front panel an AM Volume Control, AM Off-On Switch, AM Tuning Dial and Tone Control. The Horizontal Linearity Control is located on the underside of the chassis directly below the high voltage supply compartment and can be adjusted with a small screwdriver. The Horizontal Size Control is located above the Deflection Yoke and is fastened to the Focus Coil Mounting Bracket. The cathode-ray tube bias control is located at the left hand front corner of the chassis. See Figure 1 for a block diagram of the television receiver.

The weights of the Chatham and Stratford receivers are as follows:

Chassis, Cabinet, and Accessories	84 lbs.
Shipping Weight, Gross	109 lbs. (in carton)

*Trade Mark.

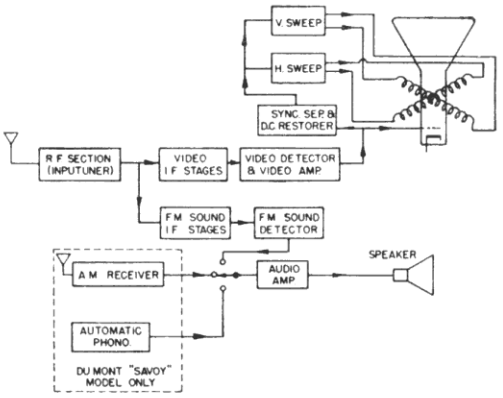


Figure 1. Block Diagram of Du Mont RA-103 Telesets

The following vacuum tubes are used in both the Type 7040A1 and Type 7040A2 television receiver chassis:

Tube Symbol	*Tube Type*	*Tube Function*
V101	6J6 (miniature)	R.F. Amplifier
V102	6AK5 (miniature)	Mixer
V103	6J6 (miniature)	V.H.F. Oscillator
V201	6AG5 (miniature)	1st Video IF
V202	6AG5 (miniature)	2nd Video IF
V203	6AG5 (miniature)	3rd Video IF
V204-A	6AL5 (miniature)	Video Detector
V204-B	Part of V204-A	D.C. Restorer and Sync Takeoff
V205	6AC7	Video Amplifier
V206	12JP4 (Teletron)	Picture Tube
V207	6AU6 (miniature)	Ist Sound IF
V208	6AU6 (miniature)	FM Sound Limiter
V209	6AL5 (miniature)	FM Sound Detector
V210	6SJ7	1st Sound Amplifier
V211	6V6GT/G	Sound Power Amplifier
V212-A	6SN7GT	Sync Clipper
V212-B	Part of V212-A	Horizontal Saw Generator
V213	6SJ7	Sync Clipper
V 214	6AL5 (miniature)	Sync Discriminator
V215	6K6GT/G	Horizontal Oscillator
V216-A	6SN7GT	Vertical Buffer
V216-B	Part of V216-A	Vertical Saw Generator
V217	6SN7GT	Vertical Deflection Amp.
V218	5U4G	Low Voltage Rectifier
V219	5U4G	Low Voltage Rectifier
V220	6AC7	Reactance Tube (Horz. sync)
V221	6BG6-G	Horizontal Deflection Amp.
V222	1B3-GT/8016	High Voltage Rectifier
V223	5V4G	Horizontal Damping
V224	6AL5 (miniature)	Time Delay Relay Tube

2. CIRCUIT DESCRIPTION OF THE MODEL RA-103 TELESET

2.01 Inputuner. (For schematic see Figure 9.)

The incoming signals picked up by the antenna are conducted to the input of the television receiver by means of a 73 ohm, low-loss transmission line (co-axial cable). The transmission line is terminated by the cathode input circuit of the grounded-grid RF Amplifier V101. This input circuit is capacitively coupled to the transmission line by means of capacitor C101. The untuned input circuit has been designed so that it presents the proper impedance match to the transmission line over the entire tuning range from 44 to 216 megacycles. The inductance L106 in parallel with the antenna input, provides a high-pass, radio-frequency filter to suppress broadcast-band or other low-frequency, cross-modulation interference which may arise when the television receiver is located in an extremely intense field of a local AM broadcast station or other radiator. The parallel combination C116 and R111 are placed in the grid return lead to ground in order to suppress parasitic oscillations.[1]

The plates of the Type 6J6 RF Amplifier (V101) are coupled to the grid of the Type 6AK5 mixer tube (V102) by means of a six megacycle wide broad-band coupling network. The variable series coil combinations consisting of L101-L102A and L104-L102B tune to the desired signal frequency in conjunction with the associated tube capacities and the coupling network consisting of C105, C106 and C107. Resistors R110 and R104 reduce the "Q" of the respective coils considerably in order for the coupling network to maintain the very wide pass band.

The VHF oscillator utilizes one section of the twin triode Type 6J6 (V103) in a modified Colpitts Oscillator circuit. The feedback voltage from the plate to the grid of the oscillator tube is accomplished by means of the interelectrode capacity of the vacuum tube. The oscillator frequency is adjusted by movement of the tap on the coil L102C which short circuits a portion of the coil. The oscillator circuit is factory aligned to track with the signal circuits located in the plate of the RF Amplifier V101 by adjusting the inductance of L103 and capacitance of C111.

The oscillator output is coupled to the grid of the mixer tube V102 by means of capacitor C112. Both the incoming signal and the oscillator voltages are fed into the grid of the mixer tube V102. The plate of V102 feeds into the first video IF transformer.

[1] On the later models C116 and R111 have been eliminated.

2.02 Video IF Amplifier

The video IF amplifier chain consists of three stages using the type 6AG5 sharp cutoff high gain pentode (V201, V202 and V203.) See Figure 2. Each video IF coupling network consists of two adjustable coils which are resonant with their respective tube capacities and coupling networks. The first video IF coupling network utilizes shunt inductive coupling, the second and fourth video IF coupling networks use the series type of inductive coupling, and the third network is a specially terminated "M" derived bandpass filter network. The two parallel resonant traps in the series arm of the pie network in the third coupling network provide a high degree of attenuation to the sound carrier of the station being received and to the sound carrier in the adjacent channel.

The grid of the first and second video IF stages, V201 and V202, are returned to a variable negative bias provided by the Contrast Control, which thus varies the gain of the IF amplifier. The third video IF amplifier stage is operated at maximum gain. The input to the FM sound IF amplifier system is taken from the plate of the first video IF amplifier V201.

The output of the fourth video IF coupling network is fed into one diode section of the 6AL5 video detector V204A and the diode load which consists of resistor R219 and peaking coils L213 and L214.

2.03 Video Amplifier.

The grid of the video amplifier tube V205 is directly connected to the diode load. A fixed bias of –3 volts (when no signal is present) is maintained on the grid of the video amplifier V205 by returning the low potential end of the diode load resistor R219 to the –3 volt point of the bleeder resistor network consisting of R216, R220 and R233.

The plate of the video amplifier is coupled to the Type 12JP4 Teletron, V206, by means of the resonant trap consisting of L216 and C217, and capacitor C218. This resonant trap is tuned to 4.5 megacycles and provides the video amplifier section with an extremely sharp cutoff characteristic thereby contributing to the elimination of interference from the sound carrier of the incoming television station.

2.04 DC Restorer and Sync Separator.

The plate of the video amplifier is also coupled to the second section of the Type 6AL5 vacuum tube V204B and the

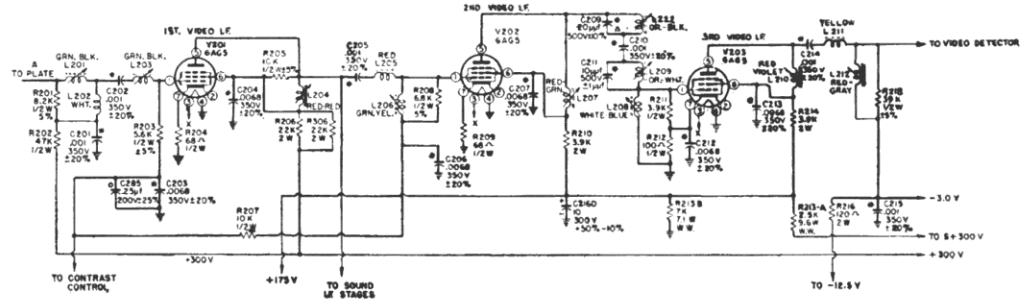


Figure 2. Schematic of Video IF Amplifier

diode load consisting of R256, R225 and C282. This circuit rectifies the composite video signal and reinserts its DC component on to the grid of the Teletron V206. The diode section of V204B also serves as a sync separator since negative composite sync pulses appear across R225.

2.05 Teletron Controls.

The Brightness Control, R227, varies the positive DC bias on the cathode of the Teletron so as to vary the picture background brightness. The Teletron *Bias Control,* R229 (one of the non-operational controls located on the chassis) varies the positive voltage on the second grid of the Teletron. The purpose of this control is to adjust individual Teletrons so that they all have a standard grid control characteristic when used in the Teleset.

2.06 Sync Clippers.

The composite sync pulses developed across R225 and C282 are coupled into the two sync clipper stages consisting of V212A and V213. The clipper stages amplify and clip both top and bottom of the sync pulses. The sync pulses developed on the plate of the second stage remain substantially constant in amplitude over a wide range of input signal level.

2.07 Vertical Deflection.

The output of the second sync clipper is fed into the vertical buffer V216A, the plate load circuit of which consists of an integrating network and one winding of the vertical blocking oscillator transformer T201. The vertical buffer amplifies and integrates the serrated vertical sync pulses and provides sharp vertical sync pulses which trigger the vertical blocking tube oscillator V216B (see Figure 14). The *Vertical Hold Control,* R275, adjusts the free running frequency of the blocking oscillator.

A sawtooth voltage is generated by charging capacitor C257 through the series resistances consisting of resistor R276 and the *Vertical Size Control* R277. The time constant of this network controls the amplitude of the sawtooth voltage.

The vertical deflection amplifier V217 converts the sawtooth voltage to the linear sawtooth current required for deflection. The vertical linearity control R281 varies the cathode bias of the vertical deflection amplifier V217 which in turn controls the degree of curvature over the operating portion of the E_g-I_p curve of this tube. This curvature compensates for an opposite curvature produced by the output transformer and vertical deflection coils, resulting in a linear change in current in the deflection coils.

The plate current of the vertical deflection amplifier V217 is fed into the vertical deflection coils by means of the vertical output transformer T202. The *Vertical Positioning Control* R284, in conjunction with the *Vertical Positioning Switch* S203 adjusts the amount and polarity of DC current in the vertical deflection coil to center the picture properly on the screen of the Teletron tube V206.

2.08 Horizontal Sync and Deflection.

The horizontal sweep is triggered by the sine wave electron coupled oscillator V215. The free running frequency of approximately 15,750 kc. is determined primarily by the oscillator winding in transformer Z204 and by capacitor C267. The Horizontal Hold Control is a powdered iron movable slug in this winding which varies its inductance. The exact frequency, however, is controlled by the repetition frequency of the incoming horizontal sync pulses. Sychronization is accomplished as follows:

The output of the horizontal oscillator is compared with the incoming horizontal sync pulses in the discriminator circuit of V214. The resulting DC "error" voltage which is developed across the discriminator load resistors R263 and R264 will vary in amplitude and polarity depending upon the relative difference in phase between the sine wave oscillator and the incoming sync pulses. The DC error voltage which is impressed upon the grid of the reactance tube V220 causes the plate current and transconductance of the reactance tube V220 to vary accordingly. The capacitive reactance which the reactance tube V220 presents to the tuned circuit is, therefore, varied, causing the oscillator to shift phase in proportion to the amount of the error voltage, and in the direction to bring the oscillator into phase with the incoming sync pulses. Thus, the oscillator is locked to the sync pulses.

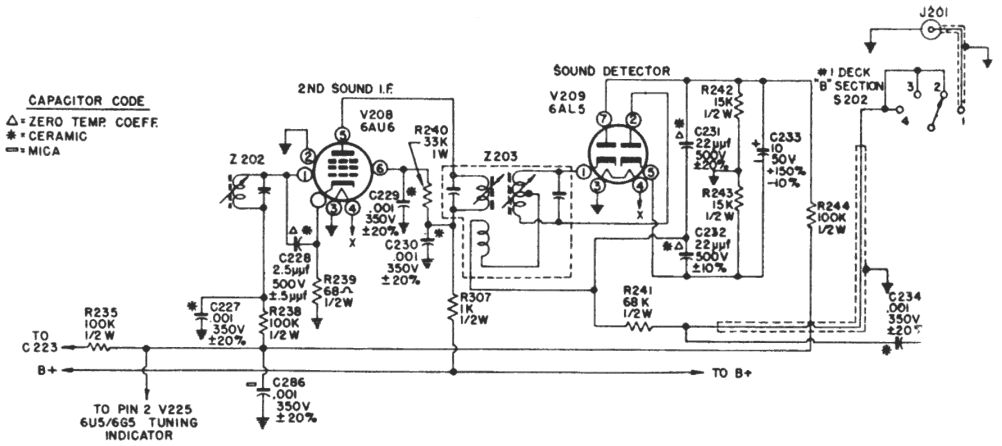
The actual phase relationship between sync pulses and oscillator can be varied by means of the *Phasing Control,* a powdered iron slug in the discriminator winding of Z204, so as to make the picture start at just the right place horizontally on the raster.

The output from the plate of the horizontal oscillator is fed into the differentiating network consisting of capacitor C251 and resistor R268. The sharp tips of the differentiated positive pulses shown in Figure 51 cause the horizontal sawtooth generator V212B to discharge the sweep generating capacitor C271, thereby initiating the return trace of the horizontal sweep. The charging time constant network consisting of R296, R315, C271 and the *Horizontal Drive Control* R297 is returned to the most negative point in the power supply through the cathode bias resistor R300 controlling the amount of sweep voltage impressed upon the grid of the horizontal deflection amplifier V221, the horizontal drive control adjusts the linearity of the beginning and end of each horizontal trace.

2.09 Horizontal Output Amplifier and High Voltage Power Supply.

The high voltage required to accelerate the electron stream in the Teletron V206 is generated by a "fly back" type of power supply. During the return trace of the sweep the energy which is stored in the horizontal deflection coil circuit is fed back into the primary winding of the horizontal output transformer T204 in the form of a very sharp negative pulse. This pulse is increased in amplitude by auto-transformer action in the primary winding and is rectified by the high voltage rectifier V222. The rectified energy which is stored in the high voltage capacitor C277 is used to accelerate the electron stream in the teletron.

The horizontal damping tube V223 and the damping resistor, R304, critically dampen the ringing in the horizontal deflection yoke which occurs during the line retrace period. Part of the energy so absorbed is utilized to "boost" the plate trace of V221 by feeding the B supply in series with the voltage developed across the damper tube V223 on to the plate of the horizontal deflection amplifier V221. The horizontal linearity network consisting of L219, C275 and C276 is used to shift the phase of the booster voltage. By shifting the phase of this booster voltage with respect to the plate current requirements of V221, slight variations of plate characteristics are obtained. The *Horizontal Positioning Control,* R305, controls the DC current through the horizontal deflection coils.



NOTE: ALL CAPACITOR VALUES ARE MICROFARAD UNLESS OTHERWISE SPECIFIED.
ALL RESISTORS 10% TOLERANCE UNLESS OTHERWISE SPECIFIED.

Figure 3. Schematic of Ratio Detector (Used in First Production Run of Model RA-103 Telesets)

2.10 Sound IF Channel.

In sets which were produced in the earliest production run, the television sound channel has two IF stages, V207 and V208, using critically coupled IF transformers. The second IF stage feeds into an FM ratio detector which converts the frequency modulated IF carrier to audio frequencies, suppresses amplitude modulation interference, and also provides AVC for the sound IF stages. This circuit is shown in Figure 3.

The sound taken from the junction of capacitors C231 and C232 is passed through the de-emphasis network consisting of R241 and C234 to the front section of the selector switch. The audio amplifier consists of one stage of high gain audio amplification V210 and the audio output stage V211 which feeds into the permanent magnet speaker.

Sets produced in later runs are connected with V207 as an IF stage, V208 as the limiter, and V209 as a conventional FM discriminator. See Figure 11 at back of book. R244 and C234 make up the de-emphasis network.

2.11 Power Supply.

The low voltage power supply of the television receiver is obtained from a pair of 5U4G rectifiers connected for full wave, high current rectification, with conventional filtering.

The low voltage power is applied to the receiver by the closing of the time delay relay K201. This relay is energized by the diode current of V224. The relay circuit has been designed so that the relay is energized approximately ten seconds after the power is applied to the television receiver. In this way all capacitors and other components are protected from the high surge voltage which otherwise would occur before the tubes heated up and started to draw plate current.

2.12 Focus Coil and Control.

The focus coil, L218, is in series with the section of the power supply which delivers 300 volts to most of the circuits. The current drain of these circuits provides more than enough current for proper focus. The focus current is adjusted to bring the Teletron to precise focus by means of the *Focus Control* R288, which is a variable resistor shunted, together with R286B, across the focus coil.

3. INSTALLATION OF THE TELESET

The RA-103 television receiver has been designed to operate from an unbalanced transmission line (co-axial cable) whose characteristic impedance is 73 ohms. This shielded type of cable, when properly utilized, provides a greater degree of noise immunity than a parallel wire balanced type of transmission line. The inner conductor of the 73 ohm co-axial cable is connected to the antenna input terminal marked "A" and the shield is connected to the antenna input terminal marked "G." In order to avoid a discontinuity in the transmission line it is important to bring the shielded cable as close to the terminals as possible, cutting back only enough of the shield to make the connection (not over 1/2 inch), and keeping the ground lead as well as the center lead as short as possible (not over 1/2 inch).

A broad band antenna, providing satisfactory reception on all thirteen channels and on the FM band, with a matching stub or other suitable means for matching the balanced output of the antenna to the unbalanced transmission line should be used. The matching arrangement is particularly important where the signal is weak and the local noise level high. In such instances the extra directional sensitivity of an antenna with reflector, properly oriented, also may be desirable. This antenna, too, must have a matching device if maximum discrimination against noise is to be achieved. An antenna with reflector will also be useful when there is a "ghost" image produced by a reflection from a hill or other object on the opposite side of the antenna from the transmitting station.

It should be noted that many types of antennas which operate satisfactorily on the lower frequency channels cannot provide satisfactory reception on all channels due to their wide variations in sensitivity and bandwidth characteristics with frequency.

The RA-103 receivers have been designed with adequate ventilation to insure operation of all components well within their temperature ratings, ensuring long, trouble-free operation. *Care must be taken in installing the receivers not to obstruct the ventilation openings at the top, at the back, and, in the case of the table model, at the bottom. The back should be kept at least an inch away from a wall or other obstructing surface.*

4. SERVICE NOTES

4.1 INITIAL ADJUSTMENTS OF THE RA-103 TELESET.

All controls with the exception of Horizontal Linearity, Horizontal Phasing and Teletron Bias Controls are accessible without removing the receiver chassis from its cabinet. The horizontal linearity, and horizontal phasing controls have been factory aligned and are sufficiently broad in adjustment to eliminate the need for field adjustment. The Bias Control only needs to be adjusted if the Teletron is replaced.

Normal Operation.

With the service selector switch turned to the television position in which the pilot light is on, turn the audio volume control to the right about half of its range, thus turning on the receiver. Turn the Brightness Control almost completely clockwise and turn the contrast completely counterclockwise. Approximately ten seconds after the power is turned on, a "click" will be heard indicating that the surge protection relay is energized.

Subsequently, a raster will appear on the picture tube. Adjust the Brightness Control for a moderate brightness, below the point at which the raster size increases due to excessive drain on the high voltage power supply. Adjust the focus control for greatest clarity of the lines at the center of the raster.

Turn the brightness control counterclockwise until the raster just becomes invisible. Turn the illuminated tuning dial to a television broadcast station by adjusting the tuning eye indicator for the maximum closing of the luminescent screen. Turn the contrast control to the right until the proper contrast is obtained.

Adjustment of Non-Operational Controls.

If the picture does not remain stationary, determine which hold control needs readjustment. The horizontal hold control is adjusted by means of the threaded screw protruding from the aluminum can at the back of the receiver. Determine the two extreme positions in which the picture falls INTO synchronism (not out of synchronism) and set the control half way between these two positions. Set the vertical hold control in the middle of its lock-in range if readjustment is needed.

The horizontal phasing control is located on the bottom of the same aluminum can which contains the horizontal hold control and can be manipulated only from the bottom of the chassis. Readjustment of this control will seldom be necessary

In case it should be necessary, however, the procedure is as follows:

Position the raster to the left by means of the horizontal positioning control. Increase the picture brightness and decrease the contrast so that the entire raster is visible including the area at the right which is normally "blanked out." There should be a vertical gray strip of about 1/4" wide at the right of the raster adjacent to the right edge of the picture. Still further to the right there may be a still darker vertical strip or there may not. If the darker strip is present, and is more than 3/16" wide, or if the first lighter gray strip is not present, the phasing is not correct. The phasing control should be adjusted until the left edge of the darker strip is located at the extreme right edge of the raster (so that the dark strip almost disappears).

Adjust the brightness and contrast of the picture so that the "blanked" edges of the raster disappear, and then adjust both horizontal and vertical positioning controls so that the picture is centered with respect to the picture frame of the cabinet. The *Vertical Positioning Control* controls the amount of vertical positioning and the *Vertical Positioning Switch* controls the direction (up or down).

Adjust the vertical size control so that the height of the picture equals the height of the picture frame opening. Readjust the vertical positioning control to center the picture.

Adjust the horizontal size of the picture with the aid of a screwdriver so that the width of the picture equals the width of the picture frame opening. This adjustment is located above the focus coil and is mounted on the same bracket assembly as the focus coil. Readjust the horizontal positioning control to center the picture.

Observe any non-linear sweep distortions and determine if either the horizontal or vertical sweeps, or both, need adjustment. The horizontal drive control has the effect of spreading or compressing right side of the picture with respect to the left side of the picture. This control has been preset at the factory on a special test pattern and should not require field alignment. The horizontal linearity adjustment has the effect of expanding or compressing the middle portion of the picture with respect to the sides. Readjust the horizontal size control after the horizontal drive control has been turned.

The vertical linearity control has the effect of expanding the picture at an increasing rate from the bottom to the top of the picture. Adjustment of this control has the greatest effect on the top portion of the picture, some effect on the middle of the picture, and very little effect on the bottom of the picture. The vertical size and centering controls will need readjustment as a result of the change in position of the vertical linearity control.

When replacing the Teletron, the Teletron Bias Control may be adjusted as follows: Turn the contrast control to the extreme left so no picture appears. Adjust brightness control so that the arm of the control reads plus fifty volts with respect to ground using a high resistance DC vacuum tube voltmeter. Adjust the Teletron *Bias Control* to the position where the raster just becomes invisible.

4.2 REMOVAL OF TELEVISION RECEIVER CHASSIS FROM CABINET.

1. Remove the knobs on the front panel. The small knobs are of the "push-on" type. The large tuning knob has set screws.

2. Remove the screws fastening the back grill to the cabinet.

3. Without turning the cabinet on its side or on its back, remove the four bolts fastening the receiver chassis to the bottom panel of the cabinet.

4. Turn the receiver so that the back of the cabinet can be observed and slide the chassis until it is fully removed from its cabinet.

5. To reinsert the television receiver in its cabinet repeat the above steps in reverse order.

4.3 REMOVAL AND REPLACEMENT OF THE TELETRON.

1. Remove the television receiver chassis from its cabinet as outlined in the preceding paragraph.

2. With the aid of a spintite wrench, remove the screws that fasten the Teletron bracket to the chassis.

3. Disconnect the socket and high voltage lead from the Teletron.

4. Remove the corrugated paper around the neck of the Teletron within the focus coil.

5. Grasp the Teletron firmly with both hands along its outer edge and gently slide it out of the focus and deflection coils.

CAUTION

Never grasp the Teletron by its neck or allow pressure to be exerted on the neck.

For test patterns see back of Manual

6. Place the Teletron, face down, on a flat surface covered by a clean soft cloth, in a location where it will not be disturbed.

7. When the Teletron is ready to be replaced in the receiver chassis, slide the tube gently back into the deflection coils until the center of its face surface extends about 3/16" beyond the front edge of the chassis. Move the deflection yoke and focus coil forward as far as possible. Adjust the screws which fasten the Teletron bracket to the chassis so that the center of the Teletron screen is 7-1/2 inches from the bottom edge of the chassis. Also, see that the neck of the Teletron is centered in the focus coil. This centering must be accomplished by proper seating of the front part of the Teletron. *Do not allow pressure to be exerted on the neck.* Replace the corrugated strip of paper.

8. Adjust the focus coil so it is perpendicular to the axis of the Teletron. The focus coil should be located 1/8" from the deflection yoke.

REMOVAL AND REPLACEMENT OF THE INPUTUNER.

1. Unsolder four power leads coming out of the inputuner to the receiver chassis. *Do not cut the leads; keep them full length.* Denote the color coding of the wires and the terminals from which the wires were removed.

2. Unsolder the inputuner antenna cable leads at the antenna terminals.

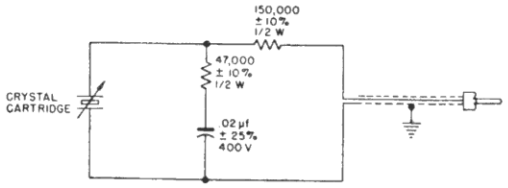
3. Remove the five screws which fasten the inputuner to the chassis.

4. Lift the inputuner from the chassis.

5. To put in the new inputuner, reverse the steps above.

4.4 TEST EQUIPMENT NEEDED FOR SERVICING THE RA-103 TELESETS.

Equipment Needed	*Required Characteristics*
A. *Trouble Shooting*	
Oscillograph (5-inch CRT preferable) (Du Mont Type 241 or equivalent)	Very high input impedance. Must readily synchronize with "Y" axis signal. Amplifier response must be satisfactory up to at least two megacycles. Must not compress input signal until a reasonably sized waveform appears. Wide range input attenuator.
Voltage Calibrator (Du Mont Type 264-A or equivalent)	Suitable for calibrating the amplitude of the waveshapes on the "Y" axis of the oscillograph.
Electronic volt-ohmmeter	Very high input impedance for d.c. voltage measurements.
Vacuum Tube Tester	Any good commercial instrument.
B. *IF and Video Alignment*	
Wobbulator	Center frequency of 25 megacycles (approx.); sweep width of 10 megacycles (adjustable); Output voltage up to 0.10 volt; adjustable attenuator. Frequency range from 20 to 100 mc. minimum.
Signal Generator	Frequency calibration reliable to better than 100 kc. per dial division. Attenuator should be adjustable and very accurate; modulation up to 30%.
Probe Detector	See Note 7, for schematic diagram.
Oscillograph (Du Mont Type 208-B or equivalent)	A high gain "Y" axis amplifier with good square wave 60 cycle response.



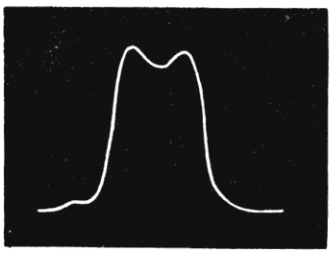
Schematic Diagram of Record Changer Assembly (Savoy Console Model Only)

TABLE OF VOLTAGES

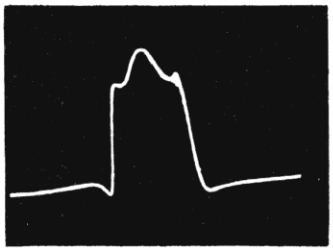
Pin Voltages Measured to Ground with no Signal, Maximum Contrast

Symbol	Type	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V201 (1)	6AG5	0	1.0	A.C. 6.3 V	GND	145	145	1.0	
V202 (1)	6AG5	0	1.0	6.3	GND	145	145	1.0	
V203	6AG5	0	1.1	6.3	GND	135	135	1.1	
V204	6AL5	0	3.0	6.3	GND	3.0	GND	0	
V205	6AC7	GND	A.C. 6.3	GND	3.0	GND A.C.	175	GND	240
V206	12JP4	GND	0	Pin 10	Pin 11	Pin 12			
	6AU6	-0.5	GND	310 V	35 V	6.3 V	170	90	
V207				GND	A.C. 6.3	290			
V208 (1)	6AU6	0.5	GND	GND	A.C. 6.3	290	170	90	
V209	6AL5	0	0	GND	A.C. 6.3	0	NC	0	
V210	6SJ7	GND	GND	GND	-2.1 V	GND	60 V	A.C. 6.3 V	190 V
V211	6V6	GND	GND	250 V	265	12.5		A.C. 6.3 V	GND
V212	6SN7	0	200V	250 V	-45	80	GND	A.C. 6.3 V	GND
V213	6SJ7	GND	GND	250 V	0.0	GND	5.0	A.C. 6.3 V	300 V
V214	6AL5	-1.5	-1.75	250 V	A.C. 6.3 V	-1.5	NC	-1.8	
V215	6K6	GND	GND	220	227	-4.5	NC	A.C. 6.3 V	-0.5
V216	6SN7	-65	200V	220	0	145	7.5	GND	A.C. 6.3 V
V217	6SN7	0	350	15 V	0	350 V	15	A.C. 6.3 V	GND
V218	5U4		440		A.C. 390 V		A.C. 390		440
V219	5U4		440		A.C. 390 V		A.C. 390 V		440
V220	6AC7	GND	GND	GND	-1.9 V	0	-115	A.C. 6.3 V	240 V
V221	6BG6	GND	GND	-3.0		-22		A.C. 6.3 V	250
V222	8016								
V223	5V4		A.C. 5 V		410		415		A.C. 5 V
V224	6AL5	45	-12.5	A.C. 6.3 V	A.C. 6.3 V	45	NC	-12.5	
V101	6J6	120	120	A.C. 6.3 V	GND	GND	GND	1.85	
V102	6AK5	-1.25 (1)	12	GND	A.C. 6.3	190	50	12	
V103	6J6	150 (1)	GND	A.C. 6.3	GND	GND	-8.6 (1)	GND	

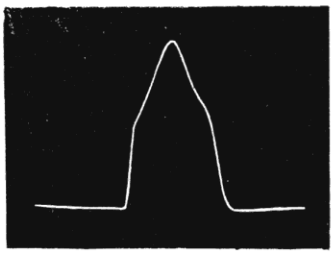
(1) These voltage readings will be influenced by capacity to ground of measuring equipment.



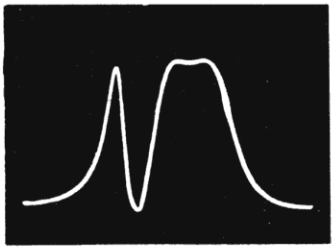
A—4th Coupling Network L210, L212



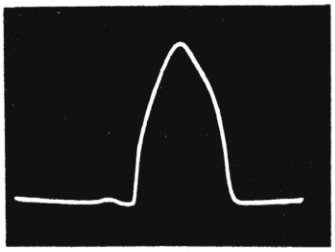
B—3rd Coupling Network L207, L208, L209 and L222



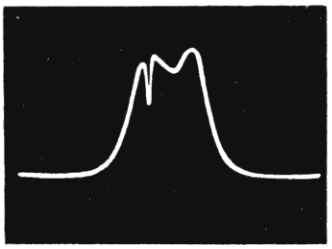
C—2nd, 3rd, Video I.F. Stages



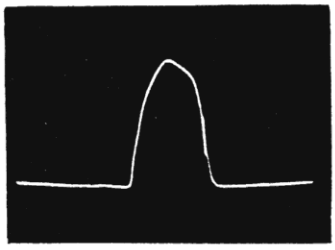
D—2nd Coupling Network L204, L206



E—2nd, 3rd and 4th Video IF Stages



F—1st Coupling Network L201, L203



G—All Video IF Stages

Figure 4. Alignment Waveforms for Model RA-103 Telesets

4.5 ALIGNMENT AND ADJUSTMENT NOTES.

1. The sound IF and video IF carriers in the model RA-103 television receiver are 21.9 megacycles and 26.4 megacycles, respectively.

2. When the television receiver is repaired or aligned, always turn the chassis on its side so that the power transformer is located on the bottom. Never turn the receiver on its end or other side.

3. Always place a piece of sponge rubber or block of wood between the power transformer and the work bench. Failure to observe this precaution will result in the crushing of one or several of the vacuum tubes in the inputuner section.

4. Never disconnect the loudspeaker while the power is turned on. If it is necessary to operate the receiver without the loudspeaker, remove the audio output tube, V211.

5. If the television receiver must be operated with the picture tube removed from the chassis, tape or cover the exposed end of the high voltage lead.

6. Always reconnect the high voltage lead so that the wire runs along the underside of the neck of the Teletron.

7. Always mount the television receiver chassis on a metal top work bench so that good contact between the receiver chassis and the metal top is maintained.

8. Connect the metal cabinets of all test equipment to the metal top work bench by means of heavy ground wires.

9. All lead connections from the signal generators and wobbulators must be shielded. Keep the exposed ends and ground leads as short as possible (about one inch).

10. Always locate the ground lead connections as close as possible to their respective "hot" leads in the television receiver chassis.

11. The wobbulator or signal generator output must be kept low enough to prevent overloading the television receiver circuits. The limiting action produced by overloading causes incorrect response curves.

12. The alignment procedure must be followed in the order shown in the alignment chart.

A. IF AND VIDEO ALIGNMENT TABLE

Step No.	To Adjust	Type of Input Signal Required	Connect Generator Leads Across (see note 1)	Connect Output Leads Across (see note 1)	Feed Output Leads Directly Into Oscillograph or Into Oscillograph Via Probe Detector See Note 8	Adjust Coils to Conform to Response Pattern Shown In	Remarks
1	L210 L212	Wobbulator & unmodulated RF signal	Pin 1 (grid), V203 and chassis	Pin 2 (grid), V206 and chassis	Direct	Figure 4A	
2	L222	30% mod. signal at 21.9 mc.	Pin 1 (grid), V202 and chassis	Pin 2 (grid), V206 and chassis	Direct	None	Adjust coil for a minimum deflection on the oscillograph
3	L209	30% mod. signal at 27.9 mc.	Pin 1 (grid), V202 and chassis	Pin 2 (grid), V206 and chassis	Direct	None	Adjust coil for a minimum deflection on the oscillograph
4	L207 L208	Wobbulator & unmodulated RF signal	Pin 1 (grid), V202 and chassis	Pin 5 (plate), V203 and chassis	Probe Detector	Figure 4B	Readjust L209
5	Check 2nd & 3rd video IF stages	Wobbulator & unmodulated RF signal	Pin 1 (grid), V202 and chassis	Pin 2 (grid), V206 and chassis	Direct	Figure 4C	If necessary readjust L207 and L208
6	Z201 pri. (top coil)	30% mod. signal at 21.9 mc.	Pin 1 (grid), V201 and chassis	Pin 2 (grid), V206 and chassis	Direct	None	Adjust coil for minimum deflection on the oscillograph
7	L204 L206	Wobbulator & unmodulated RF signal	Pin 1 (grid), V201 and chassis	Pin 5 (plate), V202 and chassis	Probe Detector	Figure 4D	
8	Check 1st, 2nd & 3rd video IF stages	Wobbulator & unmodulated RF signal	Pin 1 (grid), V201 and chassis	Pin 2 (grid), V206 and chassis	Direct	Figure 4E	If necessary readjust L204 and L206
9	L201 L203	Wobbulator & unmodulated RF signal	Pin 1 (grid), V102 and chassis	Pin 5 (plate), V201 and chassis	Probe Detector	Figure 4F	See note 2
10	Check all video IF stages	Wobbulator & unmodulated RF signal	Pin 1 (grid), V102 and chassis	Pin 2 (grid), V206 and chassis	Direct	Figure 4G	If necessary readjust L206. See note 2
11	Z202	Wobbulator & unmodulated RF signal at 21.9 mc.	Pin 1 (grid) V207 and chassis	Pin 5 (plate), V208 and chassis	Probe Detector	None	Adjust for a symmetrical response
12	Z203 (primary)	Unmodulated RF signal at 21.9 mc.	Pin 1 (grid) V207 and chassis	Junction R320 & R321	Use high impedance DC voltmeter instead of oscillograph	None	Adjust primary (bottom coil) for maximum reading
13	Z201 sec. (bottom coil), Z203 sec.	Unmodulated RF signal at 21.9 mc.	Pin 1 (grid) V201 and chassis	Junction R320 & R321	Use high impedance DC voltmeter instead of oscillograph	None	Align secondary (top coil) for zero meter reading, *i.e.*, so that the meter will swing through zero. Voltmeter should be set on lowest DC scale
14	L216	Unmodulated RF signal at 4.5 mc.	Pin 4 (grid), V205 and chassis	Pin 2 (grid), V206 and chassis	Use high impedance DC voltmeter instead of oscillograph	None	Adjust coil for maximum voltmeter reading

PRECAUTIONARY NOTES:

1. Locate all ground lead connections as close as possible to their respective "hot" leads.
2. Remove the Type 6AK5 mixer and carefully solder a comparatively fine wire on to pin 1. Examine connection to make certain that the wire is not shorted to any other prong. Reinsert the tube into its socket and connect the inner conductor of the signal generator lead to this wire. (See note 7, page 20.)

4.51 Inputuner Alignment Procedure.

I. TEST EQUIPMENT REQUIRED

Equipment	*Required Characteristics*
Wobbulator	High frequency wobbulator; bandwidth 10-12 mc.; center frequency variable over the complete television spectrum of channels 1-13; output variable to maximum of 0.1 volt; output impedance 72 ohms.
Signal generator	High frequency signal generator; minimum frequency range 40-250 mc.; 72 ohm output.
Oscillograph	Having a high gain Y axis amplifier with good 60 cycle square wave response (such as Du Mont Model 208-B).
Non-capacitive screwdriver	Made of 1/4" fiber rod having screwdriver chisel ends.
Dummy shield	Made specially to fit readily over unit to reproduce shielded conditions, allowing ready access to trimmers and end coil adjustments.
Voltmeter	High impedance having at least one megohm of DC resistance on the 3 volt scale.

II. OSCILLATOR ALIGNMENT

A. Set up:

1. Solder a 3" insulated lead to the screen pin of the 6AK5 mixer tube socket (V102 pin 6), passing this lead through the shield cover at the same point the plate lead passes through.
2. Connect the Y axis of the oscillograph to the screen lead through a shielded cable to minimize extraneous pick-up.
3. Connect the X axis of the oscillograph to the wobbulator sweep output. (If no external output for sweep voltage is provided on the wobbulator use the regular sawtooth sweep of the oscillograph, noting that two traces will appear for each complete sweep if the oscillograph time base is set at 60 cycles.
4. Connect the output of the signal generator to the antenna post of the receiver, keeping all connecting leads as short as possible.
5. Connect a high impedance vacuum tube voltmeter to the cathode, Pin 5, of the discriminator, V209.

B. Adjustments:

CAUTION

The following presupposes that the sound IF system and the discriminator are correctly aligned.

1. Set the inputuner dial exactly to channel 4. With modulation on the signal generator, set the signal generator to 71.75 mc. Rotate C111 to a maximum audible signal, then set more accurately by means of a null on the voltmeter. (The voltmeter will swing both positive and negative while this adjustment is being made, and a higher scale should be used for initial settings, reducing the scale and eliminating modulation for finer adjustments to guard against damage to the voltmeter.)

2. The high frequency setting of the oscillator is made with the receiver dial set to channel 13, the signal generator, with modulation, set at 215.75 mc.; adjustment is made by pulling or squeezing the end coil L104 with similar procedure as above. (Squeezing the end coil together reduces frequency; spreading the turn apart increases frequency.) Be careful not to short the coil.

3. Check all low frequency channels to make sure that the sound is received at the correct dial setting. In each case the signal generator should be set to the sound frequency allocated to the particular channel under test. If the shield cover has been removed to make any adjustments, all the oscillator settings must be rechecked with the cover in place.

Channel	*1*	*2*	*3*	*4*	*5*	*6*
Sound Freq. (MC.)	49.75	59.75	65.75	71.75	81.75	87.75
Channel	*7*	*8*	*9*	*10*	*11*	
Sound Freq. (MC.)	179.75	185.75	191.75	197.75,	203.75	
Channel	*12*	*13*				
Sound Freq. (MC.)	209.75	215.75				

III. BAND PASS ALIGNMENT

A Set up:

1. Retain steps 1, 2, 3 and 5 of Part II.
2. Connect the output of the wobbulator through 72 ohm coaxial to the antenna and ground posts of the receiver, keeping all connecting leads as short as possible (under 3/4 inch).
3. Connect the signal generator between the shielded side of the input cable and chassis ground. (This will allow sufficient signal injection across the stray inductance between the two grounds to obtain a birdie for checking the bandpass frequencies without causing any discontinuity to the input impedance.)

B. Adjustments:

1. When the oscillator has been correctly set, the bandpass circuits can be aligned. The low frequency adjustment is made by means of C107, C105, and C106, which are adjusted to give a bandpass of 4.5 mc. on channel 3. With the teleset dial set on channel 3, sound should be obtained with the signal generator set at 65.75 mc., and a "birdie" should appear on the high frequency peak of the passband. With the signal generator set at 61.25 mc. (no change in Teleset tuning) the "birdie" should fall on the low frequency peak. The peak to valley ratio should not exceed 30%.

2. High frequency adjustments.—The high frequency adjustment is done by means of end coils L101 and L105. The bandwidth should not exceed 6 mc. nor be less than 4.5 mc. With the Teleset dial set at channel 13, sound should be obtained with the signal generator set at 215.75 mc. and a birdie should appear within the passband. With the signal generator set at 211.25 mc. (no change in teleset tuning) a birdie should appear within the passband also. (This holds true when a maximum bandwidth of 6 mc. is obtained. If the bandwidth should be 4.5 both birdies would appear on the bandpass peaks.)

CAUTION

All station channels should be checked with nothing but the signal generator connected to the antenna terminals using amplitude modulation in a point to point check to eliminate possibility of error in impedance matching with varying types of wobbulating equipment.

The alignment of the inputuner should not be attempted by any serviceman who is unfamiliar with wide bandpass circuits. Since the manufacturer maintains service for a nominal fee on all inputuners, it is recommended that the service company use this facility rather than spend time in acquiring a know-how for correct alignment of the inputuner, especially since costly apparatus is involved.

4.6 SERVICING THE AM TUNER IN THE SAVOY CONSOLE MODEL.

The type 7045-A1 AM Tuner chassis which is used only in the Console Model is a 6 tube superhetrodyne radio receiver designed for operation on a 115 volt, 60 cycle, AC power source. The power consumption of the receiver is 60 watts. The vacuum tubes used are:

Tube Symbol	*Tube Type*	*Tube Function*
V401	6BA6 (miniature)	RF Amp.
V402	6BE6 (miniature)	Converter
V403	6BA6 (miniature)	IF Amp.
V404	6SQ7	Det.—A.V.C.
V405	6V6GT/G	Audio Power Output
V406	5Y3GT	Rectifier

This receiver covers the frequency range from 530 to 1620 kilocycles.

4.61 Installation.

This receiver is equipped with a built-in loop antenna, making it unnecessary to use an external antenna and ground. In some steel-framed buildings the loop pick-up may be improved by forming a one turn loop out of the incoming television coaxial cable and locating the cable very close to the AM tuner loop.

4.62 Operation.

The front panel controls are the station selector tuning dial, the audio volume control, and the power on-off switch. The power on-off switch disconnects the power supplied to the television receiver and record player when power is applied to the AM tuner.

4.63 Disassembly Instructions.

To remove the chassis from the cabinet for servicing, first remove the volume and tuning knobs. First remove the screws fastening the back screen to the cabinet. Then remove the two screws fastening the AM tuner chassis to the wooden shelf after having disconnected the power line plug, loudspeaker and teleset power plugs. Slide the chassis out of the cabinet from the rear. Remove the loudspeaker from the back side of the front panel and reconnect the speaker plug to the audio output receptacle of the AM tuner.

4.64 Alignment Procedure.

The alignment should be made with the volume control fully on and the output from the signal generator as low as possible to prevent A.V.C. action from interfering with the correct alignment.

A cathode-ray oscillograph or output meter should be connected across the voice coil of the speaker.

CAUTION

When connecting the signal generator output leads to the receiver, place a .25 mfd. condenser in series with the inner conductor of the signal generator output lead.

1. Turn the tuning condenser to the low frequency and adjust the dial set screw so that the 530 kc. dial scale mark lines up with the dial pointer.

2. Turn the tuning dial to the extreme high frequency end. Connect the signal generator output leads across the middle section of the tuning gang and feed in a 455 kc. signal. Adjust the trimmers in both IF transformers for maximum cathode-ray oscillograph reading.

3. Disconnect all leads. Place the AM tuner and the loudspeaker back into their respective positions within the console cabinet. Connect the power and loudspeaker plugs. Reconnect the oscillograph across the loudspeaker voice coil. Connect a two-foot piece of wire to the inner conductor of the signal generator output lead and locate this wire as close as possible to the AM tuner pick-up loop. Turn the tuning dial to 1500 kc. and feed in a 1500 kc. signal from the generator. Adjust all the tuning gang trimmers for maximum audio output.

4.7 AVERAGE SENSITIVITY AND STAGE GAINS

4.71 Video IF System

The following table indicates the signal input required at various points to produce the indicated output. The signal generator is to be 30% modulated at 400 cycles.

Connect Signal Generator	*Signal Generator Frequency*	*Oscillograph Connected To*	*Output*	*Microvolts Input*
Pin 1 V203	24 mc.	Pin 2 V206	25 V p-p	105,000
Pin 1 V202	24 mc.	"	"	7,000
Pin 1 V201	24 mc.	"	"	500
Pin 1 V102	24 mc.	"	"	54
Antenna terminals[1]	82 mc.	"	"	62

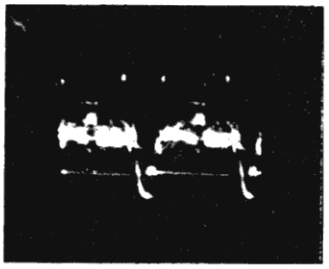
[1] The signal generator is to be connected to the receiver with sufficient series resistance to make the generator impedance match 73 ohms. The receiver is to be tuned to 84 mc.

4.72 Sound IF System

The following table indicates the signal input required at various points to produce 1/2 watt output across a 3.2 ohm resistor connected in place of the voice coil. The audio gain control shall be at maximum with the selector switch in FM position. The FM signal generator shall be deviated ±75 kc. with 400 cycle modulation.

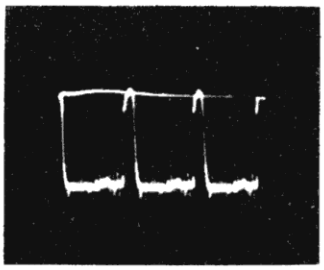
Connect Signal Generator	*Signal Generator Frequency*	*Microvolts Input*
Pin 1, V208	21.9 mc.	30,000
Pin 1, V207	"	1,500
Pin 1, V201	"	200
Pin 1, V102	"	23
Antenna terminals[1]	100 mc.	25

[1] The signal generator is to be connected to the receiver with sufficient series resistance to make the generator impedance match 73 ohms. The receiver is to be tuned to 100 mc.

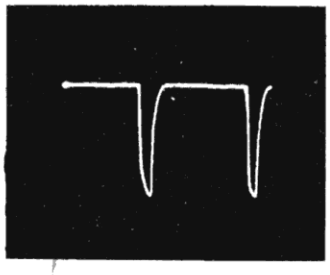


A—Grid of CRT, Pin 2, V206. 17 Volts p.p. (Adjusted by Contrast Control)

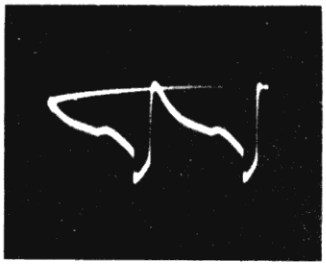
B—Sync Takeoff, Pin 1, V212A. 4 Volts p.p.



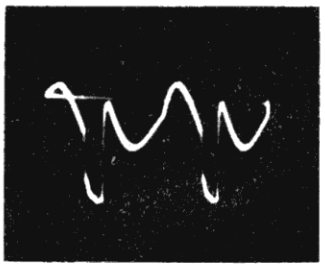
C—Plate of 1st Sync Clipper, Pin 2, V212A. 6 Volts p.p.



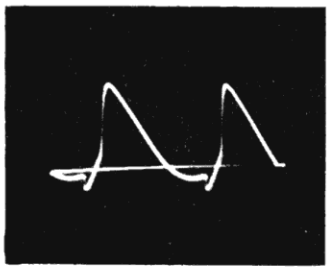
D—Plate of 2nd Sync Clipper, Pin 8, V213. 37 Volts p.p.



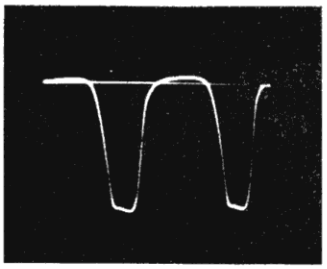
E—Sync Input White Lead, Z204. 10 Volts p.p.



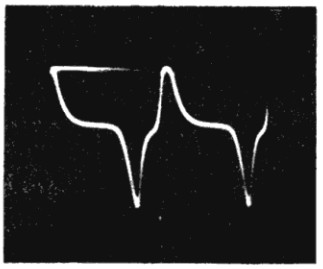
F—Sync Plus Sine Wave, Pin 1, V214. 16 Volts p.p.



G—Sync Plus Sine Wave, Pin 5, V214. 19 Volts p.p.



H—Horiz. Osc. Output, Pin 3, V214 210 Volts p.p.



I—Horiz. Osc. Differentiated. 105 Volts p.p.

J—Vertical B.T.O. Pulse, Pin 1, V216B. 185 Volts p.p.

K—Vertical Saw Pin 1 & 4, V217. 100 Volts p.p.

L—Horizontal Saw Pin 5, V212B. 110 Volts p.p.

Figure 5. Typical Sweep Waveforms of Model RA-103 Telesets

ALLEN B. DU MONT LABS., INC. MODEL RA-103

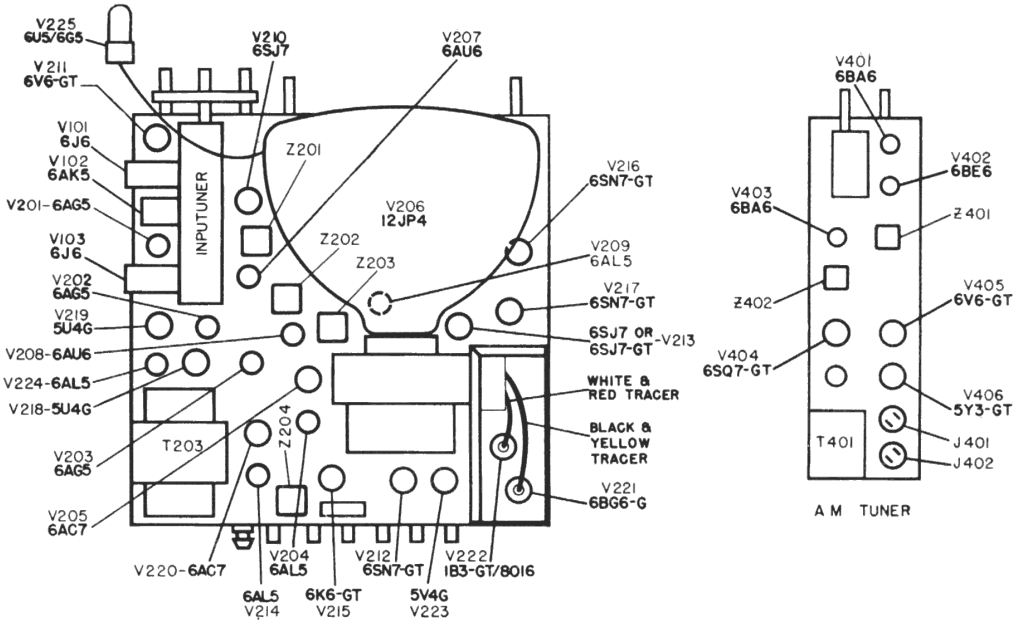


Figure 6. Chassis Layout Drawing (Du Mont RA-103)

4.73 AM Tuner

The following table indicates the signal input required at various points to produce a 1/2 watt audio output across a 3.2 ohm resistor connected in place of the voice coil. The audio gain control shall be at maximum. The R.F. signal generator shall be modulated 30% by a 400 cps tone.

Connect Signal Generator	*Signal Generator Frequency*	*Input in Volts*
R.F. Amp. grid, pin 1, V401	1000 K.C.	70 x 10^{-6}
Converter grid, pin 7, V402	1000 K.C.	390 x 10^{-6}
Converter grid, pin 7, V402	456 K.C.	270 x 10^{-6}
I.F. Amp. grid, pin 1, V403	456 K.C.	5000 x 10^{-6}
1st A.F. Amp. grid, pin 2, V404	400 cps.	.150
Pwr. Amp. grid, pin 5, V405	400 cps.	3.25

VOLTAGE MEASUREMENTS

Taken with an incoming signal of 1000 K.C. which was modulated by 400 cps tone, 30% modulated. All measurements taken on a 20,000 ohm per volt multi-meter. The input signal level is adjusted until the A.V.C. voltage reads minus 2 volts dc.

Symbol	*Tube Type*	*Pin 1*	*Pin 2*	*Pin 3*	*Pin 4*	*Pin 5*	*Pin 6*	*Pin 7*	*Pin 8*
V401	6BA6	–0.5	0	0	A.C. 6.3	240	95	0	.....
V402	6BE6	–.39	.....	0	A.C. 6.3	230	95	–.52	.....
V403	6BA6	–0.52	0	0	A.C. 6.3	225	95	0	.....
V404	6SQ7GT	0	A.C. –0.35	.....	–0.72	–0.4	100	A.C. 6.3	0
V405	6V6GT/G	0	0	225	225	0	.....	A.C. 6.3	11
V406	5Y3GT	.....	320	.....	A.C. 260	.....	A.C. 260	.....	320

Across C414D—225 v. dc.
Across C414C—245 v. dc.

MODEL RA-103 ALLEN B. DU MONT LABS., INC.

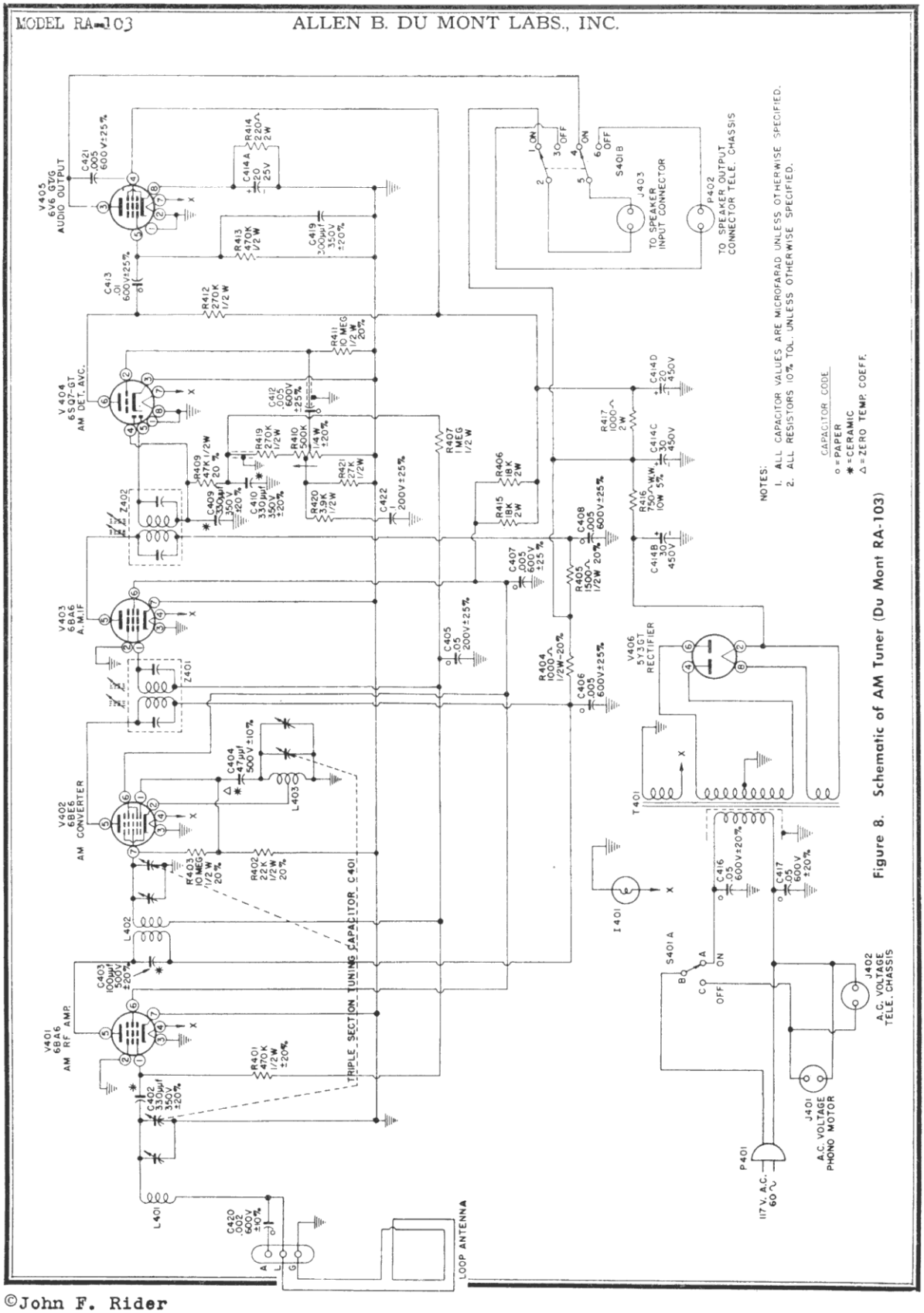


Figure 8. Schematic of AM Tuner (Du Mont RA-103)

NOTES

1. On later models, C116 and R111 which are located in the RF Tuner assembly have been eliminated.

2. In order to eliminate regeneration in the sound IF Amplifier, C225 has been changed to the following:

Symbol No.	*Reference or Drawing No.*	*Description*
C225	CM35B472K	Capacitor, fixed: mica; .0047 mfd. ±10%; 500 V.

3. In the Schematic Diagram, Figure 11, R211, 3.9 K resistor should be returned to the chassis ground instead of the cathode, pin 7 of V203.

4. In the Schematic Diagram, Figure 11, R305 should read 25 ohms ±10% 4 watts.

5. On later models the contacts of relay K201 were relocated to interrupt the "B" plus lead in the power supply instead of the "B" minus lead. The contacts now break the circuit between the junction of R316, C262 and L217, and pin nos. 8 of V218, V219.

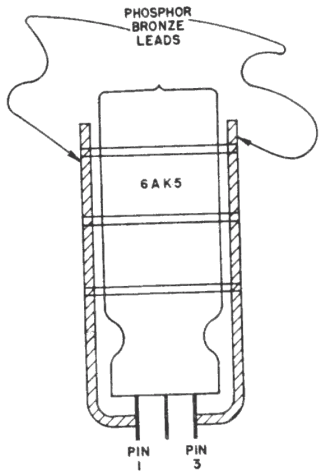
6. On later models the tuning indicator tube has been changed to the octal based type 6AL7-GT. The following changes were made: (a) The indicator cable assembly was changed from Du Mont Part No. 51B-13322 to Du Mont Part No. 48-13432.

(B) *Connect Pin # (V225)*	*To*	*Color Code of Wire*
1	Pin 8, V225	None
2	Pin 1, S202 #2 deck "A" section	Green
3	Junction R255, R311, C242	Red
4	Junction R320, C233, R321	Yellow
5	Pin 6, V225	None
6	Pin 2, X210 (See Fig. 10)	Black
7	Pin 2, X210 (See Fig. 10)	Blue
8	Pin 1, V225	None

(c) The tuning indicator bezel has been changed from Du Mont Part No. 58B-13007 to Du Mont Part No. 58A-13436-102.

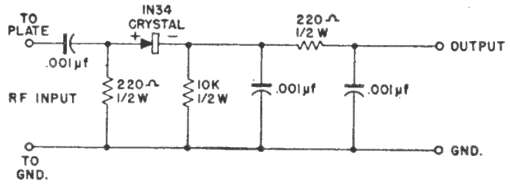
(d) Remove R321, 470 K ohms ±10%, ½ W from the circuit.

7. A drawing of the adapter tube for IF alignment is shown below. (See paragraph 4.4(B).)



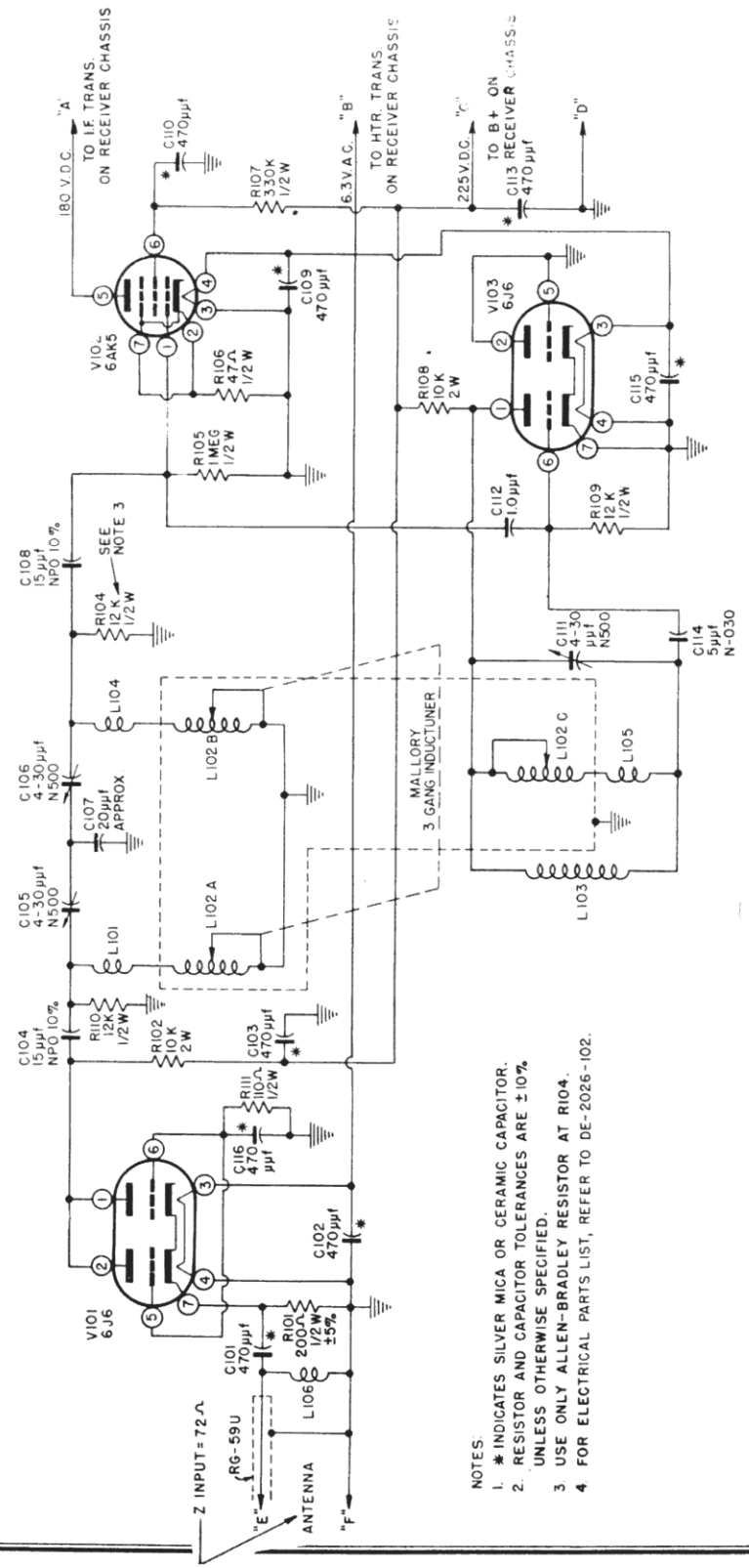
6AK5 Adapter Tube

8. The schematic for a crystal detector mounted in a probe assembly to enable IF stage to be aligned stage-by-stage is shown below.



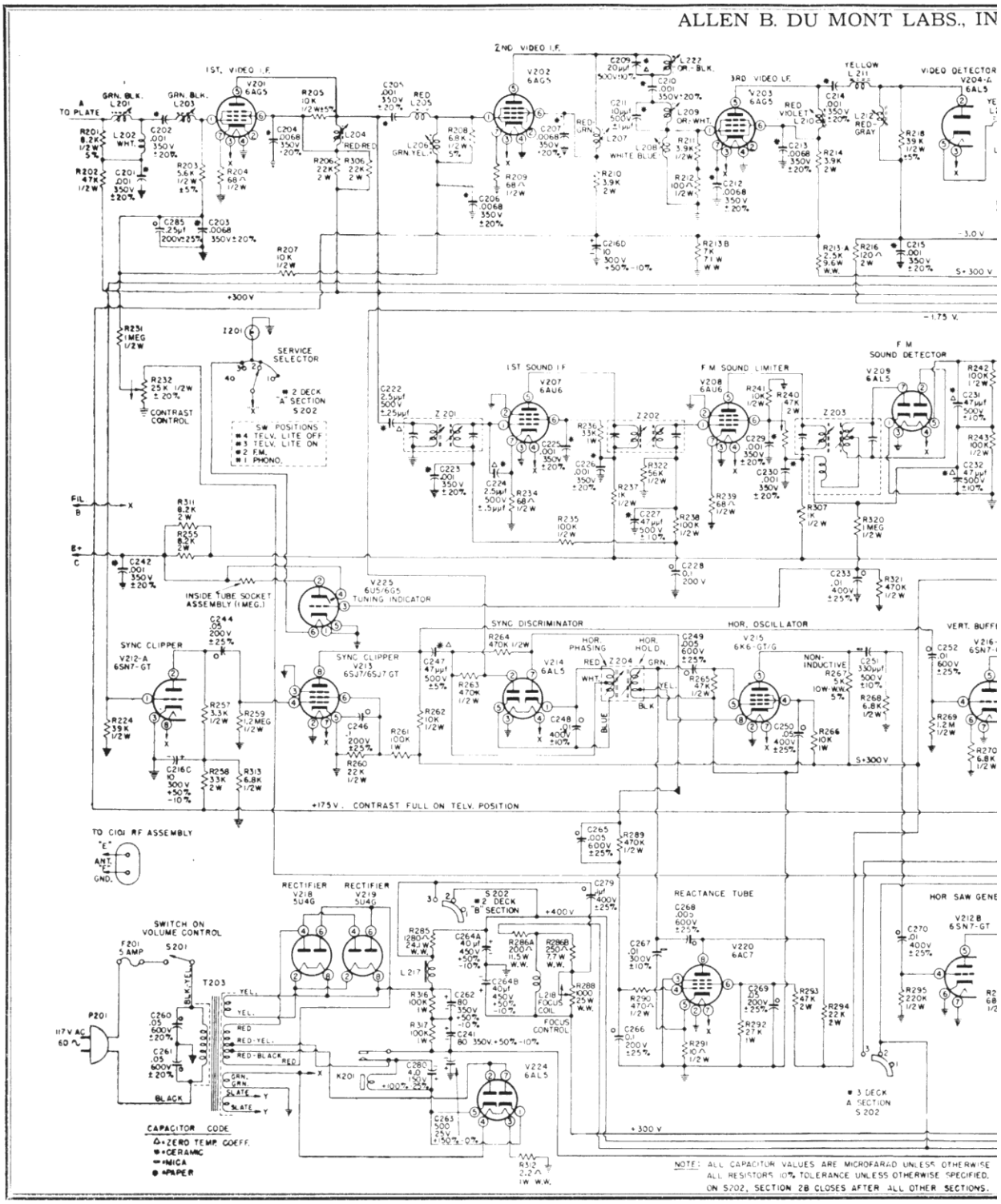
Probe Detector

MODEL RA-103 ALLEN B. DU MONT LABS., INC.

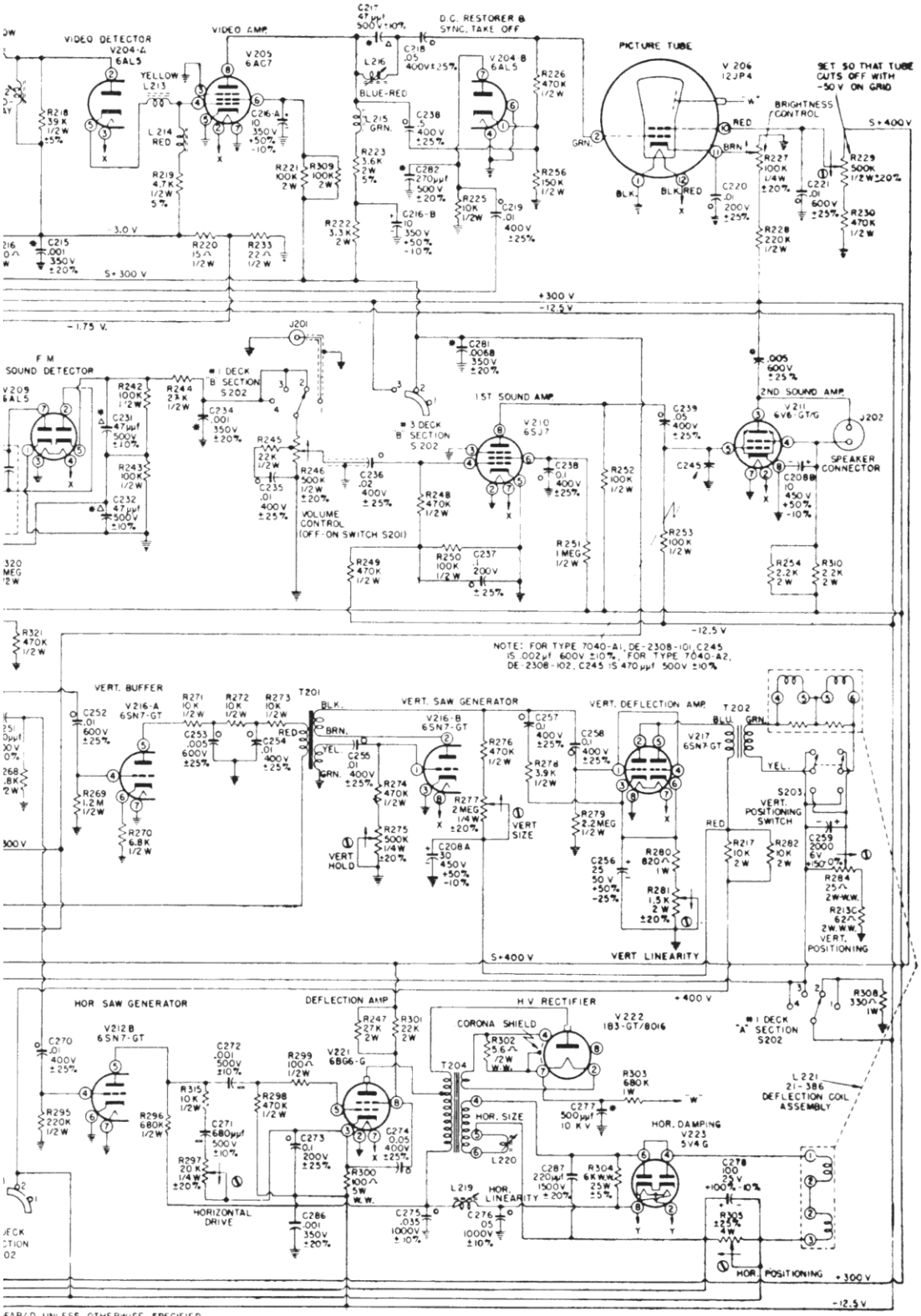


NOTES:
1. * INDICATES SILVER MICA OR CERAMIC CAPACITOR.
2. RESISTOR AND CAPACITOR TOLERANCES ARE ±10% UNLESS OTHERWISE SPECIFIED.
3. USE ONLY ALLEN-BRADLEY RESISTOR AT R104.
4. FOR ELECTRICAL PARTS LIST, REFER TO DE-2026-102.

Figure 9. Schematic of RF Tuner (Du Mont RA-103)


ALLEN B. DU MONT LABS., IN
2ND VIDEO I.F.
1ST. VIDEO I.F.
3RD VIDEO I.F.
VIDEO DETECTOR
1ST SOUND I.F.
F.M. SOUND LIMITER
F.M. SOUND DETECTOR
SERVICE SELECTOR
CONTRAST CONTROL
INSIDE TUBE SOCKET ASSEMBLY (1 MEG.)
SYNC CLIPPER
SYNC DISCRIMINATOR
HOR. OSCILLATOR
HOR. PHASING
HOR. HOLD
NON-INDUCTIVE
REACTANCE TUBE
FOCUS COIL
FOCUS CONTROL
RECTIFIER
SWITCH ON VOLUME CONTROL
TO CIOI RF ASSEMBLY
+175 V. CONTRAST FULL ON TELV. POSITION
+300 V
-3.0 V
-1.75 V
CAPACITOR CODE
NOTE: ALL CAPACITOR VALUES ARE MICROFARAD UNLESS OTHERWISE
ALL RESISTORS 10% TOLERANCE UNLESS OTHERWISE SPECIFIED.
ON S202, SECTION 2B CLOSES AFTER ALL OTHER SECTIONS.

NT LABS., INC. MODEL RA-103



FARAD UNLESS OTHERWISE SPECIFIED.
LESS OTHERWISE SPECIFIED.
ER ALL OTHER SECTIONS.

Figure 11. Schematic of Main Chassis for Du Mont Model RA-103 Teleset

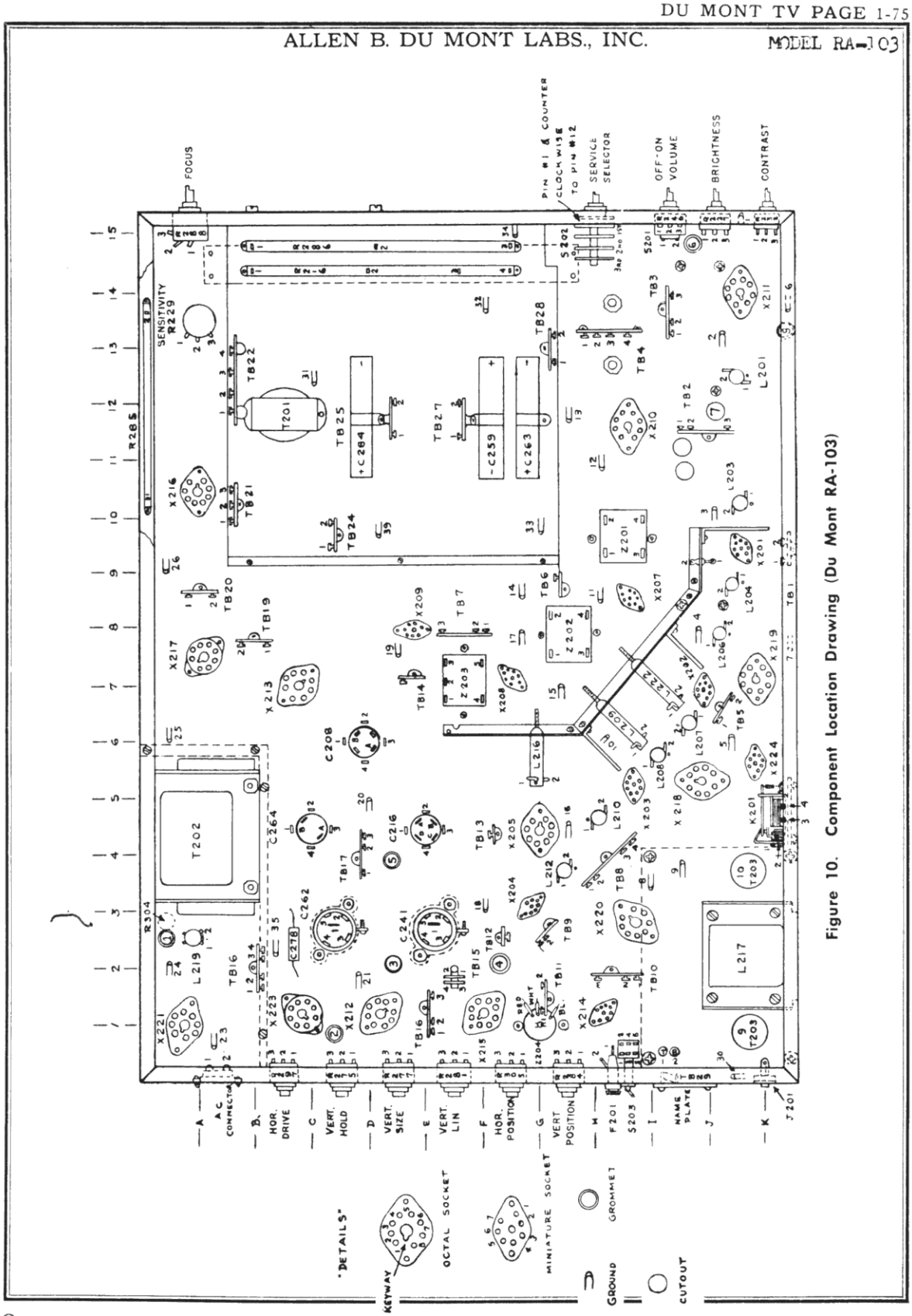


Figure 10. Component Location Drawing (Du Mont RA-103)

MODEL RA-103 ALLEN B. DU MONT LABS., INC.

ELECTRICAL PARTS LIST DE-2308

Symbol No.	Reference Drawing or Part No.	Description
C201	3-1394	Capacitor, fixed; ceramic; .001 mfd; ±20%; 350 V
C202	3-1394	Capacitor, fixed: ceramic; .001 mfd; ±20%; 350 V
C203	3-1392	Capacitor, fixed: ceramic; .0068 mfd; ±20%; 350 V
C204	3-1392	Capacitor, fixed: ceramic; .0068 mfd; ±20%; 350 V
C205	3-1394	Capacitor, fixed: ceramic; .001 mfd; ±20%; 350 V
C206	3-1392	Capacitor, fixed: ceramic; .0068 mfd; ±20%; 350 V
C207	3-1392	Capacitor, fixed: ceramic; .0068 mfd; ±20%; 350 V
C208A	3-1411	Capacitor, fixed; electrolytic; 2 section; 30+10 mfd; +50, −10%; 450 V
C208B		Part of C208A
C209	3-1401	Capacitor, fixed: ceramic; 20 mmfd; Zero Temp. Coeff.; ±10%; 500 V
C210	3-1394	Cacapitor, fixed: ceramic; .001 mfd; ±20%; 350 V
C211	3-1308	Capacitor, fixed: ceramic; 10 mmfd; ±1 mmfd; 500 V
C212	3-1392	Capacitor, fixed: ceramic; .0068 mfd; ±20%; 350 V
C213	3-1392	Capacitor, fixed: ceramic; .0068 mfd; ±20%; 350 V
C214	3-1394	Capacitor, fixed: ceramic; .001 mfd; ±20%; 350 V
C215	3-1394	Capacitor, fixed: ceramic; .001 mfd; ±20%; 350 V
C216A	3-1412	Capacitor, fixed; electrolytic; 4 section; 10+10+10+10 mfd; +50, -10%; 350 V, 350 V, 300 V, 300 V
C216B		Part of C216A
C216C		Part of C216A
C216D		Part of C216A
C217	3-1273 or 3-1420	Capacitor, fixed: ceramic; 47 mmfd; Zero Temp. Coeff.; ±10%; 500 V
C218	3-1402	Capacitor, fixed: paper; .05 mfd; ±25%; 400 V
C219	3-145	Capacitor, fixed: paper; .01 mfd; ±25%; 400 V
C220	3-1391	Capacitor, fixed: paper; .1 mfd; ±25%; 200 V
C221	3-1256	Capacitor, fixed: paper; .01 mfd; ±25%; 600 V
C222	3-1457	Capacitor, fixed: ceramic; 2.5 mmfd; ±.25 mmfd; Zero Temp. Coeff.; 500 V
C223	3-1394	Capacitor, fixed: ceramic; .001 mfd; ±20%; 350 V
C224	3-272 or 3-1428	Capacitor, fixed; ceramic; 2.5 mmfd; ±.5 mmfd; Zero Temp. Coeff.; 500 V
C225	3-1394	Capacitor, fixed: ceramic; .001 mfd; ±20%; 350 V
C226	3-1394	Capacitor, fixed: ceramic; .001 mfd; ±20%; 350 V
C227	3-1420	Capacitor, fixed: paper; 47 mmfd; Zero Temp. Coeff.; ±10%; 500 V
C228	3-1391	Capacitor, fixed: paper; .1 mfd; ±25%; 200 V
C229	3-1394	Capacitor, fixed: ceramic; .001 mfd; ±20%; 350 V
C230	3-1394	Capacitor, fixed: ceramic; .001 mfd; ±20%; 350 V
C231	3-1420	Capacitor, fixed: ceramic; 47 mmfd; Zero Temp. Coeff.; ±10%; 500 V
C232	3-1420	Capacitor, fixed: ceramic; 47 mmfd; Zero Temp. Coeff.; ±10%; 500 V
C233	3-145	Capacitor, fixed: paper; .01 mfd; ±25%; 400 V
C234	3-1394	Capacitor, fixed: ceramic; .001 mfd; ±20%; 350 V
C235	3-145	Capacitor, fixed: paper; .01 mfd; ±25%; 400 V
C236	3-146	Capacitor, fixed: paper; .02 mfd; ±25%; 400 V
C237	3-1391	Capacitor, fixed: paper; .1 mfd; ±25%; 200 V
C238	3-1404	Capacitor, fixed: paper; .1 mfd; ±25%; 400 V
C239	3-1402	Capacitor, fixed: paper; .05 mfd; ±25%; 400 V
C240	3-157	Capacitor, fixed: paper; .005 mfd; ±25%; 600 V
C241	3-1408	Capacitor, fixed: electrolytic; 80 mfd; +50, −10%; 350 V
C242	3-1394	Capacitor, fixed: ceramic; .001 mfd; ±20%; 350 V
C244	3-95	Capacitor, fixed: paper; .05 mfd; ±25%; 200 V
C245	3-1443	Capacitor, fixed: paper; .002 mfd; ±10%; 600 V
C245	3-1292	Capacitor, fixed: ceramic; 470 mmfd; ±10%; 500 V
C246	3-1391	Capacitor, fixed: paper; .1 mfd; ±25%; 200 V
C247	3-1395 or 3-1419	Capacitor, fixed: ceramic; 47 mmfd; Zero Temp. Coeff.; ±5%; 500 V
C248	3-341	Capacitor, fixed: paper; .01 mfd; ±10%; 400 V
C249	3-157	Capacitor, fixed: paper: .005 mfd; ±25%; 600 V
C250	3-1402	Capacitor, fixed: paper; .05 mfd; ±25%; 400 V
C251	CM20A331K	Capacitor, fixed: mica; 330 mmfd; ±10%; 500 V
C252	3-1256	Capacitor, fixed: paper; .01 mfd; ±25%; 600 V
C253	3-157	Capacitor, fixed: paper; .005 mfd; ±25%; 600 V
C254	3-145	Capacitor, fixed: paper; .01 mfd; ±25%; 400 V
C255	3-145	Capacitor, fixed: paper; .01 mfd; ±25%; 400 V
C256	3-1389	Capacitor, fixed: electrolytic; 25 mfd; +50, −25%; 50 V
C257	3-1404	Capacitor, fixed: paper; 0.1 mfd; ±25%; 400 V
C258	3-1404	Capacitor, fixed: paper; 0.1 mfd; ±25%; 400 V
C259	3-1225 or 3-1437	Capacitor, fixed: electrolytic; 2000 mfd; +150, − 0%; 6 V
C260	3-1405 or 3-1418	Capacitor, fixed: paper; .05 mfd; ±20%; 600 V
C261	3-1405 or 3-1418	Capacitor, fixed: paper; .05 mfd; ±20%; 600 V
C262	3-1408	Capacitor, fixed: electrolytic; 80 mfd; +50, −10%; 350 V
C263	3-1287	Capacitor, fixed: electrolytic; 500 mfd; +150, −0%; 25 V
C264A	3-1413	Capacitor, fixed: electrolytic; 2 section; 40+40 mfd; +50, −10%; 450 V
C264B		Part of C264A
C265	3-157	Capacitor, fixed: paper; .005 mfd; ±25%; 600 V
C266	3-1391	Capacitor, fixed: paper; 0.1 mfd; ±25%; 200 V
C267	CM35A103K	Capacitor, fixed: mica; .01 mfd; ±10%; 300 V
C268	3-157	Capacitor, fixed: paper; .005 mfd; ±25%; 600 V
C269	3-95	Capacitor, fixed: paper; .05 mfd; ±25%; 200 V
C270	3-145	Capacitor, fixed: paper; .01 mfd; ±25%; 400 V
C271	CM30A681K	Capacitor, fixed; mica; 680 mmfd; ±10%; 500 V
C272	CM30A102K	Capacitor, fixed: mica; .001 mfd; ±10%; 500 V
C273	3-1391	Capacitor, fixed: paper; .1 mfd; ±25%; 200 V
C274	3-1402	Capacitor, fixed: paper; .05 mfd; ±25%; 400 V
C275	3-1406	Capacitor, fixed: paper; .035 mfd; ±10%; 1000 V
C276	3-1407	Capacitor, fixed: paper; .05 mfd; ±10%; 1000 V
C277	3-1183 or 3-1441	Capacitor, fixed: ceramic; 500 mmfd; 10 kv.
C278	3-1409	Capacitor, fixed: electrolytic; 100 mfd; +100, −10%; 25 V
C279	3-1404	Capacitor, fixed: paper; .1 mfd; ±25%; 400 V
C280	3-1367	Capacitor, fixed: electrolytic; 4 mfd; +100, −25%; 150 V
C281	3-1392	Capacitor, fixed: ceramic; .0068 mfd; ±20%; 350 V
C282	3-1427	Capacitor, fixed: ceramic; 270 mmfd; ±20%; 500 V
C283	3-1426	Capacitor, fixed: paper; 0.5 mfd; ±25%; 400 V
C285	3-42	Capacitor, fixed: paper; .25 mfd; ±25%; 200 V
C286	3-1394	Capacitor, fixed: ceramic; .001 mfd; ±20%; 350 V
C287	3-1474	Capacitor, fixed: mica; 220 mmfd; ±20%; 1500 V
F201	11-11	Fuse, cartridge, 5 amp., 250 V
I201	39-4	Lamp, incandescent, 0.25 amp., 6.3 V
J201	9-276	Connector, female
J202	9-486	Connector Assembly, female, 2 contact
K201	5-241	Relay, armature, SPST
L201	21A-13089-101	Coil, 21.9 mc. Video IF
L202	21B-12411	Coil, 21.9 mc. Video IF. Coupling

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Symbol No.	Reference Drawing or Part No.	Description
L203	21A-13089-102	Coil, 21.9 mc. Video IF
L204	21A-13090-101	Coil, 21.9 mc. Video IF
L205	21B-12412	Coil, 21.9 mc. Video I.F. Coupling
L206	21A-13089-103	Coil, 21.9 mc. Video IF
L207	21A-13090-102	Coil, 21.9 mc. Video IF
L208	21A-13088-101	Coil, 21.9 mc. Video IF
L209	21A-13087-101	Coil, 21.9 mc. Video IF
L210	21A-13090-103	Coil, 21.9 mc. Video IF Trap.
L211	21B-12410	Coil, 21.9 mc. Video I.F. Coupling
L212	21A-13090-104	Coil, 21.9 mc. Video IF
L213	21B-12413-3	Coil, Video Peaking
L214	21B-12413-2	Coil, Video Peaking
L215	21B-12413-1	Coil, Video Peaking
L216	21A-13098-101	Coil, 4.5 mc. Trap.
L217	21C-12432	Choke, filter, 5 hy., 70 ohm, 310 ma.
L218	21C-12586-101	Assembly Focus Coil
L219	21A-13307	Assembly inductor; linearity control
L220	21A-13230-101	Assembly, inductor; size control
L221	21-388	Yoke, deflection coil
L222	21A-13087-102	Coil, 21.9 mc. Video IF Trap.
R201	RC20BF822J	Resistor, fixed: composition; 8200 ohm; ±5%; 1/2 W
R202	RC20BF473K	Resistor, fixed: composition; 47,000 ohm; ±10%; 1/2 W
R203	RC20BF562J	Resistor, fixed: composition; 5600 ohm; ±5%; 1/2 W
R204	RC20BF680K	Resistor, fixed: composition; 68 ohm; ±10%; 1/2 W
R205	RC20BF103J	Resistor, fixed: composition; 10,000 ohm; ±5%; 1/2 W
R206	RC40BF223K	Resistor, fixed: composition; 22,000 ohm; ±10%; 2 W
R207	RC20BF103K	Resistor, fixed: composition; 10,000 ohm; ±10%; 1/2 W
R208	RC20BF682J	Resistor, fixed: composition; 6800 ohm; ±5%; 1/2 W
R209	RC20BF680K	Resistor, fixed: composition; 68 ohm; ±10%; 1/2 W
R210	RC40BF392K	Resistor, fixed: composition: 3900 ohm; ±10%; 2 W
R211	RC20BF392J	Resistor, fixed: composition: 3900 ohm; ±5%; 1/2 W
R212	RC20BF101K	Resistor, fixed: composition: 100 ohm; ±10%; 1/2 W
R213A	2-1759	Resistor, fixed: 3 section; wire wound; 2500/7000/62 ohms; 9.6, 7.1, 2 watts; ±10%
R213B		Part of R213A
R213C		Part of R213A
R214	RC40BF392K	Resistor, fixed: composition: 3900 ohm; ±10%; 2 W
R216	RC40BF121K	Resistor, fixed: composition: 120 ohm; ±10%; 2 W
R217	RC40BF103K	Resistor, fixed: composition: 10,000 ohm; ±10%; 2 W
R218	RC20BF393J	Resistor, fixed: composition: 39,000 ohm; ±5%; 1/2 W
R219	RC20BF472J	Resistor, fixed: composition; 4700 ohm; ±5%; 1/2 W
R220	RC20BF150K	Resistor, fixed: composition; 15 ohm; ±10%; 1/2 W
R221	RC40BF104K	Resistor, fixed: composition: 100,000 ohm; ±10%; 2 W
R222	RC40BF332K	Resistor, fixed: composition: 3300 ohm; ±10%; 2 W
R223	RC40BF362J	Resistor, fixed: composition: 3600 ohm; ±5%; 2 W
R224	RC20BF393K	Resistor, fixed: composition: 39,000 ohm; ±10%; 1/2 W
R225	RC20BF103K	Resistor, fixed: composition; 10,000 ohm; ±10%; 1/2 W
R226	RC20BF474K	Resistor, fixed: composition; 470,000 ohms; ±10%; 1/2 W
R227	1-498 or 1-553	Resistor, variable: composition; 100,000 ohms; ±20%; 1/4 W
R228	RC20BF224K	Resistor, fixed: composition; 220,000 ohms; ±10%; 1/2 W
R229	1-660 or 1-671	Resistor, variable: composition; 500,000 ohms; ±20%; 1/2 W
R230	RC20BF474K	Resistor, fixed: composition; 470,000 ohms; ±10%; 1/2 W
R231	RC20BF105M	Resistor, fixed: composition; 1 megohm; ±20%; 1/2 W
R232	1-696 or 1-700	Resistor, variable: composition: 25,000 ohms; ±20%; 3/4 W
R233	RC20BF220K	Resistor, fixed: composition; 22 ohm; ±10%; 1/2 W
R234	RC20BF680K	Resistor, fixed: composition; 68 ohms; ±10%; 1/2 W
R235	RC20BF104K	Resistor, fixed: composition; 100,000 ohm; ±10%; 1/2 W
R236	RC30BF333K	Resistor, fixed: composition; 33,000 ohms; ±10%; 1 W
R237	RC20BF102K	Resistor, fixed: composition; 1000 ohms; ±10%; 1/2 W
R238	RC20BF104K	Resistor, fixed: composition; 100,000 ohms; ±10%; 1/2 W
R239	RC20BF680K	Resistor, fixed: composition; 68 ohms; ±10%; 1/2 W
R240	RC30BF473K	Resistor, fixed: composition; 47,000 ohms; ±10%; 2 W
R241	RC20BF103K	Resistor, fixed: composition; 10,000 ohms; ±10%; 1/2 W
R242	RC20BF104K	Resistor, fixed: composition; 100,000 ohms; ±10%; 1/2 W
R243	RC20BF153K	Resistor, fixed: composition; 15,000 ±10%; 1/2 W
R244	RC20BF273K	Resistor, fixed: composition; 27,000 ohms; ±10%; 1/2 W
R245	RC20BF223K	Resistor, fixed: composition; 22,000 ohms; ±10%; 1/2 W
R246	1-691 or 1-692	Resistor, variable; composition; 500,000 ohms; ±20%; 1/2 W; tapped; SPST Switch
R247	RC40BF273K	Resistor, fixed: composition; 27,000 ohms; ±10%; 2 W
R248	RC20BF474K	Resistor, fixed: composition; 470,000 ohms; ±10%; 1/2 W
R249	RC20BF474K	Resistor, fixed: composition; 470,000 ohms; ±10%; 1/2 W
R250	RC20BF104K	Resistor, fixed: composition; 100,000 ohms; ±10%; 1/2 W
R251	RC20BF105K	Resistor, fixed: composition; 1 megohm; ±10%; 1/2 W
R252	RC20BF104K	Resistor, fixed: composition; 100,000 ohm; ±10%; 1/2 W
R253	RC20BF104K	Resistor, fixed: composition; 100,000 ohm; ±10%; 1/2 W
R254	RC40BF222K	Resistor, fixed: composition; 2200 ohm; ±10%; 2 W
R255	RC40BF822K	Resistor, fixed: composition; 8200 ohm; ±10%; 2 W
R256	RC20BF154K	Resistor, fixed: composition; 150,000 ohm; ±10%; 1/2 W
R257	RC20BF332K	Resistor, fixed: composition; 3300 ohm; ±10%; 1/2 W
R258	RC40BF333K	Resistor, fixed: composition; 33,000 ohm; ±10%; 2 W
R259	RC20BF125K	Resistor, fixed: composition; 1.2 megohm; ±10%; 1/2 W
R260	RC20BF223K	Resistor, fixed: composition; 22,000 ohm; ±10%; 1/2 W
R261	RC30BF104K	Resistor, fixed: composition; 100,000 ohm; ±10%; 1 W
R262	RC20BF103K	Resistor, fixed: composition; 10,000 ohm; ±10%; 1/2 W
R263	RC20BF474K	Resistor, fixed: composition; 470,000 ohm; ±10%; 1/2 W
R264	RC20BF474K	Resistor, fixed: composition; 470,000 ohm; ±10%; 1/2 W
R265	RC20BF473K	Resistor, fixed: composition; 47,000 ohm; ±10%; 1/2 W
R266	RC30BF103K	Resistor, fixed: composition; 10,000 ohm; ±10%; 1 W
R267	2-192 or 2-932	Resistor, fixed: wire wound; 5000 ohm; ±5%; 10 W; N. I.
R268	RC20BF682K	Resistor, fixed: composition; 6800 ohm; ±10%; 1/2 W
R269	RC20BF125K	Resistor, fixed: composition; 1.2 megohm; ±10%; 1/2 W
R270	RC20BF682K	Resistor, fixed: composition: 6800 ohm; ±10%; 1/2 W
R271	RC20BF103K	Resistor, fixed: composition; 10,000 ohm; ±10%; 1/2 W
R272	RC20BF103K	Resistor, fixed: composition; 10,000 ohm; ±10%; 1/2 W
R273	RC20BF103K	Resistor, fixed: composition; 10,000 ohm; ±10%; 1/2 W
R274	RC20BF474K	Resistor, fixed: composition; 470,000 ohm; ±10%; 1/2 W
R275	1-661 or 1-671	Resistor, variable: composition; 500,000 ohm; ±20%; 1/4 W
R276	RC20BF474K	Resistor, fixed: composition; 470,000 ohms; ±10%; 1/2 W
R277	1-662 or 1-672	Resistor, variable: composition; 2 megohms; ±20%; 1/4 W
R278	RC20BF392K	Resistor, fixed: composition; 3900 ohms; ±10%; 1/2 W
R279	RC20BF225K	Resistor, fixed: composition; 2.2 megohms; ±10%; 1/2 W
R280	RC30BF821K	Resistor, fixed; composition; 820 ohms; ±10%; 1 W
R281	1-664, 1-681 or 1-682	Resistor, variable: composition; 1500 ohms; ±20%; 2 W
R282	RC40BF103K	Resistor, fixed: composition; 10,000 ohms; ±10%; 2 W
R284	1-663	Resistor, variable; wire wound; 25 ohms; ±10%; 2 W
R285	2-1761	Resistor, fixed: wire wound; 1280 ohms; ±10%; 24.1 W
R286AB	2-1760	Resistor, fixed: 2 section; wire wound; 200/250 ohm; ±10%; 11.5/7.7 W
R288	1-668 or 1-689	Resistor, variable; wire wound; 1000 ohms; ±10%; 25 W
R289	*RC20BF474K	Resistor, fixed: composition; 470,000 ohms; ±10%; 1/2 W
R290	RC20BF471K	Resistor, fixed: composition; 470 ohms; ±10%; 1/2 W

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Symbol No.	Reference Drawing or Part No.	Description
R291	RC20BF100K	Resistor, fixed: composition; 10 ohms; ±10%; 1/2 W
R292	RC30BF273K	Resistor, fixed: composition; 27,000 ohms; ±10%; 1 W
R293	RC40BF473K	Resistor, fixed: composition; 47,000 ohms; ±10%; 2 W
R294	RC40BF223K	Resistor, fixed: composition; 22,000 ohms; ±10%; 2 W
R295	RC20BF224K	Resistor, fixed: composition; 220,000 ohms; ±10%; 1/2 W
R296	RC20BF684K	Resistor, fixed: composition; 680,000 ohms; ±10%; 1/2 W
R297	1-665 or 1-670	Resistor, variable: composition; 20,000 ohms; ±20%; 1/4 W
R298	RC20BF474K	Resistor, fixed: composition; 470,000 ohms; ±10%; 1/2 W
R299	RC20BF101K	Resistor, fixed: composition; 100 ohms; ±10%; 1/2 W
R300	2-944 or 2-962	Resistor, fixed; wire wound; 100 ±5%; 5 W
R301	RC40BF223K	Resistor, fixed: composition; 22,000 ohms; ±10%; 2 W
R302	2-1763	Resistor, fixed: wire wound; 5.6 ohms; ±10%; 1/2 W
R303	RC30BF684K	Resistor, fixed: composition; 680,000 ohms; ±10%; 1 W
R304	2-1777	Resistor, fixed: wire wound; 6000 ohms; ±5%; 25 W
R305	1-666	Resistor, variable: composition; 25 ohms; ±10%; 4 W
R306	RC40BF223K	Resistor, fixed: composition: 22,000 ohms; ±10%; 2 W
R307	RC20BF102K	Resistor, fixed: composition; 1000 ohms; ±10%; 1/2 W
R308	RC30BF331K	Resistor, fixed: compositon; 330 ohms; ±10%; 1 W
R309	RC40BF104K	Resistor, fixed: composition; 100,000 ohms; ±10%; 2 W.
R310	RC40BF222K	Resistor, fixed: composition; 2200 ohms; ±10%; 2 W
R311	RC40BF822K	Resistor, fixed: composition; 8200 ohms; ±10%; 2 W
R312	2-1754	Resistor, fixed: wire wound; 2.2 ohms; ±10%; 1 W
R313	RC20BF682K	Resistor, fixed: composition; 6800 ohms; ±10%; 1/2 W
R315	RC20BF103K	Resistor, fixed: composition; 10,000 ohm; ±10%; 1/2 W
R316	RC30BF104K	Resistor, fixed: composition: 100,000 ohm; ±10%; 1 W
R317	RC30BF104K	Resistor, fixed: composition; 100,000 ohm; ±10%; 1 W
R318	RC20BF682K	Resistor, fixed: composition; 6800 ohm; ±10%; 1/2 W
R319	2-261	Resistor, fixed: wire wound; 7500 ohm; ±5%; 20 W
R320	RC20BF105K	Resistor, fixed: composition; 1 meg-ohm; ±10%; 1/2 W
R322	RC20BF563K	Resistor, fixed: composition; 56,000 ohms; ±10%; 1/2 W
S201		Part of Contrast Control R246
S202	5B-12449	Switch, Service Selector
S203	5-12	Switch, toggle, DPDT
T201	20D-4901-2	Transformer, Vertical Blocking Tube Oscillator
T202	20-380	Transformer, Vertical Sweep Output
T203	20D-12404 or 20D-12856	Transformer, Power
T204	20-375	Transformer, Horizontal Sweep and Flyback
V201	25-6AG5	Tube, electron: type 6AG5 miniature
V202	25-6AG5	Tube, electron: type 6AG5 miniature
V203	25-6AG5	Tube, electron: type 6AG5 miniature
V204	25-6AL5	Tube, electron: type 6AL5 miniature
V205	25-6AC7	Tube, electron: type 6AC7 Octal
V206	25-12JP4	Tube, electron: type 12JP4 C.R.T
V207	25-6AU6	Tube, electron: type 6AU6 miniature
V208	25-6AU6	Tube, electron: type 6AU6 miniature
V209	25-6AL5	Tube, electron: type 6AL5 miniature
V210	25-6SJ7	Tube, electron: type 6SJ7 Octal
V211	25-6V6-GT/G	Tube, electron: type 6V6-GT/G Octal
V212	25-6SN7-GT	Tube, electron: type 6SN7-GT Octal
V213	25-6SJ7-GT or 6SJ7	Tube, electron: type 6SN7-GT Octal
V214	25-6AL5	Tube, electron: type 6AL5 miniature
V215	25-6K6-GT/G	Tube, electron: type 6K6-GT/G Octal
V216	25-6SN7-GT	Tube, electron: type 6SN7-GT Octal
V217	25-6SN7-GT	Tube, electron: type 6SN7-GT Octal
V218	25-5U4G	Tube, electron: type 5U4G Octal
V219	25-5U4G	Tube, electron: type 5U4G Octal
V220	25-6AC7	Tube, electron: type 6AC7 Octal
V221	25-6BG6-G	Tube, electron: type 6BG6-G Octal
V222	25-1B3-GT or 8016	Tube, electron: type 1B3-GT/8016 Octal
V223	25-5V4G	Tube, electron: type 5V4G Octal
V224	25-6AL5	Tube, electron: type 6AL5 miniature
V225	25-6U5/6G5	Tube, electron: type 6U5/6G5
Z201	20C-12478	Transformer, 1st FM I.F.
Z202	20C-12478	Transformer, 2nd FM I.F.
Z203	20C-12477	Transformer
Z204	20C-12572-1	Transformer, Oscillator

RF Tuner Parts List

Symbol No.	Reference Drawing or Part No.	Description
C101	CM20C471K	Capacitor, fixed: mica; 470 mmfd; 500 V; ±10%
C102	3-1292	Capacitor, fixed: ceramic; 470 mmfd; 350 V; ±10%
C103	3-1292	Capacitor, fixed: ceramic; 470 mmfd; 350 V; ±10%
C104	3-1205	Capacitor, fixed: ceramic; 15 mmfd; 500 V; ±10% NPO
C105	3-307	Capacitor, variable: ceramic; 4-30 mmfd; N500
C106	3-307	Capacitor, variable: ceramic; 4-30 mmfd; N500
C107	3A-12739	Capacitor, variable: air; approx. 20 mmfd
C108	3-1205	Capacitor, fixed: ceramic; 15 mmfd; 500 V; ±10%; NPO
C109	3-1292	Capacitor, fixed: ceramic; 470 mmfd; 350 V; ±10%
C110	3-1292	Capacitor, fixed: ceramic; 470 mmfd; 350 V; ±10%
C111	3-307	Capacitor, variable: ceramic; 4-30 mmfd; N500
C112	3-1215	Capacitor, fixed: ceramic; 1.0 mmfd; 500 V; ±20%
C113	CM20C471K	Capacitor, fixed: mica; 470 mmfd; 500 V; ±10%
C114	3-1323	Cauacitor, fixed: ceramic; 5 mmfd; ±0.5 mmfd; N030
C115	CM20C471K	Capacitor, fixed: mica; 470 mmfd; 500 V; ±10%
C116	3-1292	Capacitor, fixed: ceramic; 470 mmfd; 350 V; ±10%
L101	21A-12080	Inductor, Eng—Band Pass Filter Input
L102A	21-357	Inductor, variable: 3 gang Mallory Inductuner
L102B		Part of L102A
L102C		Part of L102A
L103	21A-11281	Coil, Shunt
L104	21A-12081	Inductor, End—Band Pass Filter Output
L105	21A-12082	Inductor, End—Oscillator
L106	21A-12453	Coil, Antenna
R101	2-957	Resistor, fixed: composition; 200 ohm; ½ W; ±5%
R102	2-943	Resistor, fixed: composition; 10,000 ohm; 2 W; ±10%
R103		Omitted
R104	2-958	Resistor, fixed: composition; 12,000 ohm; ½ W; ±10%
R105	2-1208	Resistor, fixed: composition; 1 meg-ohm; ½ W; ±10%
R106	RC20BF470K	Resistor, fixed: composition; 47 ohm; ½ W; ±10%
R107	2-1202	Resistor, fixed: composition; 330,000 ohm; ½ W; ±10%
R108	2-943	Resistor, fixed: composition; 10,000 ohm; 2 W; ±10%
R109	2-956	Resistor, fixed: composition; 12,000 ohm; ½ W; ±10%
R110	2-956	Resistor, fixed: composition; 12,000 ohm; ½ W; ±10%
V101	25-6J6	Tube, electron: type 6J6
V102	25-6AK5	Tube, electron: type 6AK5
V103	25-6J6	Tube, electron: type 6J6

AM Tuner Parts List

Symbol No.	Reference Drawing or Part No.	Description
C401	3C-12714 or 3C-12987	Capacitor variable: 3 section
C402	3-1439	Capacitor, fixed: ceramic; 330 mmfd; ±20%; 350 V
C403	3-1438	Capacitor, fixed: ceramic; 100 mmfd; ±20%; 500 V
C404	3-1273 or 3-1420	Capacitor, fixed: ceramic; 47 mmfd; ±10%; 500 V; Zero Temp. Coeff.
C405	3-95	Capacitor, fixed: paper; .05 mfd; ±25%; 200 V
C406	3-157	Capacitor, fixed: paper; .005 mfd; ±25%; 600 V
C407	3-157	Capacitor, fixed: paper; .005 mfd; ±25%; 600 V
C408	3-157	Capacitor, fixed: paper; .005 mfd; ±25%; 600 V
C409	3-1439	Capacitor, fixed: ceramic; 330 mmfd; ±20%; 350 V
C410	3-1439	Capacitor, fixed: ceramic; 330 mmfd; ±20%; 350 V

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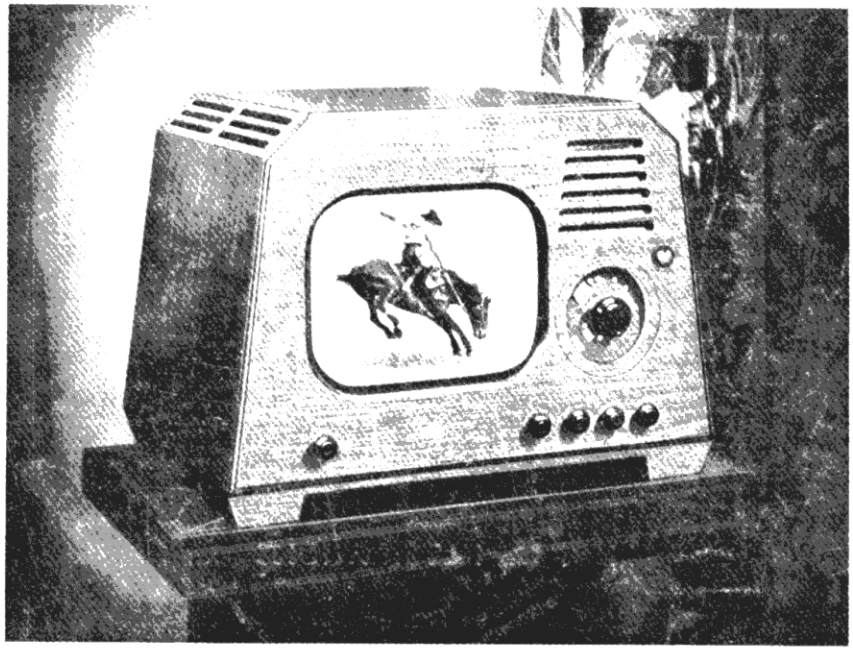
C412	3-157	Capacitor, fixed: paper; .005 mfd; ±25%; 600 V
C413	3-1256	Capacitor, fixed: paper; .01 mfd; ±25%; 600 V
C414A	3-1440	Capacitor, fixed: electrolytic; 4 section; 30+30+20+20 mfd; +50, −10%; 450/450/450/25 V
C414C		Part of C414A
C414B		Part of C414A
C414D		Part of C414A
C416	3-1405 or 3-1418	Capacitor, fixed: paper; .05 mfd; ±20%; 600 V
C417	3-1405 or 3-1418	Capacitor, fixed: paper; .05 mfd. ±20%; 600 V
C419	3-1439	Capacitor, fixed: ceramic; 330 mmfd; ±20%; 350 V
C420	3-1443	Capacitor, fixed: paper; .002 mfd. ±10%; 600 V
C421	3-157	Capacitor, fixed: paper; .005 mfd; ±25%; 600 V
C422	3-1391	Capacitor, fixed: paper; .1 mfd; ±25%; 200 V
I401	39-4	Lamp, incandescent: 0.25 amp; 6.3 V
R401	RC20BF474M	Resistor, fixed: composition; 470,000 ohm; ±20%; 1/2 W
R402	RC20BF223M	Resistor, fixed: composition; 22,000 ohm; ±20%; 1/2 W
R403	RC20BF106M	Resistor, fixed: composition; 10 megohm; ±20%; 1/2 W
R404	RC20BF102M	Resistor, fixed: composition; 1,000 ohm; ±20%; 1/2 W
R405	RC20BF152M	Resistor, fixed: composition; 1,500 ohm; ±20%; 1/2 W
R406	RC40BF183K	Resistor, fixed: composition; 18,000 ohm; ±10%; 2 W
R407	RC20BF105M	Resistor, fixed: composition; 1 megohm; ±20%; 1/2 W
R409	RC20BF473M	Resistor, fixed: composition; 47,000 ohm; ±20%; 1/2 W
R410	1-667 or 1-175	Resistor, variable: composition; 500,000 ohm; ±20%; 1/4 W
R411	RC20BF106M	Resistor, fixed: composition; 10 megohm; ±20%; 1/2 W
R412	RC20BF274K	Resistor, fixed: composition; 270,000 ohm; ±10%; 1/2 W
R413	RC20BF474K	Resistor, fixed: composition; 470,000 ohm; ±10%; 1/2 W
R414	RC40BF221K	Resistor, fixed: composition; 220 ohm; ±10%; 2 W
R415	RC40BF183K	Resistor, fixed: composition; 18,000 ohm; ±10%; 2 W
R416	2-1732	Resistor, fixed: wire wound; 750 ohm; ±5%; 10 W
R417	RC40BF102K	Resistor, fixed: composition; 1,000 ohm; ±10%; 2 W
R419	RC20BF274K	Resistor, fixed: composition; 270,000 ohm; ±10%; 1/2 W
R420	RC20BF392K	Resistor, fixed: composition; 3900 ohm; ±10%; 1/2 W
R421	RC20BF273K	Resistor, fixed: composition; 27,000 ohm; ±10%; 1/2 W
J403	9-486	Connector assembly: female; 2 contact
L401	21A-12919	Assembly, antenna coil
L402	21B-12921	Assembly, R.F. coil
L403	21A-12920	Assembly,oscillator coil
P401	46-108	Cable assembly: power
P402	9-501	Cable assembly: male; 2 contact
S401	5C-12914	Switch
T401	20D-12926	Transformer, power
V401	25-6BA6	Tube, electron: type 6BA6; miniature
V402	25-6BE6	Tube, electron: type 6BE6; miniature
V403	25-6BA6	Tube, electron: type 6BA6; miniature
V404	25-6SQ7-GT	Tube, electron: type 6SQ7-GT; octal
V405	25-6V6-GT/G	Tube, electron: type 6V6-GT/G; octal
V406	25-5Y3GT	Tube, electron: type 5Y3GT; octal
Z401	20C-12922-1	Transformer, IF
Z402	20C-12922-2	Transformer, IF



THE DU MONT CHATHAM

MECHANICAL PARTS LIST

TELEVISION RECEIVER CHASSIS TYPE 7040

Reference or Part No.	*Description*
4-3	Socket, tube, octal
4-22	Socket, tube, octal
4-113	Socket, tube: 7 prong miniature
6A-12550	Insulator, stand off
7-5	Grommet, rubber
16-135	Clamp, tube
9-500	Connector, male; 2 pin
11-55	Holder, fuse
16-6	Terminal, lug, ring
16-351	Board, terminal: 2 terminals
16-244	Board, terminal: 2 terminals
16-267	Board, terminal: 2 terminals
16-268	Board, terminal: 1 terminal
16-353	Board, terminal: 4 terminals
16-270	Board, terminal: 4 terminals
16-275	Board, terminal: 3 terminals
16-296	Board, terminal: 3 terminals
16-299	Board, terminal: 1 terminal
16C-12474	Clamp, CRT
18-267	Nut lock, push on type
26C-12457	Shield, CRT
26D-12468	Shield, base, flyback supply
26C-12706-101	Assembly, shield, flyback supply
30-451	Clamp, capacitor
30A-12450-1	Cushion, tube holder
30A-12450-3	Cushion, tube holder
31-1296	Bracket, deflection yoke
31W-12467	Chassis
31A-12472	Bracket, antenna
58B-12473	Support, CRT (lower)
58C-12475	Support, deflection and focus coil
51A-12571-101	Assembly, H.V. cable
4-110	Contact; tube socket
10-48	Washer, finishing cup #6
42C-12983	Name-plate
12-58	Lamp holder
26A-12989	Shield, light
26C-12460	Shield, RF
26A-12471	Shield, RF interstage
16-154	Feed, Thru
51B-13322	Cable, tuning indicator tube
10A-13274	Washer, insulating
16A-13304	Board, terminal; 2 terminals
16-9	Terminal lug
24A-13319	Sleeve CRT

CONSOLE MODEL SAVOY RA-103-A2

Reference or Part No.	*Description*
E-13031-101	Assembly, AM tuner chassis Type 7045-A1
69D-13004-101	Assembly, record changer
53D-12982-101	Assembly, loud speaker
22D-13003-102	Assembly, back panel
16A-12935	Clamp, back panel
58B-13007	Bezel
15A-12896-2	Knob
31-1380	Bracket, mounting of Eye Tube
15A-12896-1	Knob
15A-11218	Knob
15B-11363-101	Assembly, knob
10A-11122	Washer, felt: 1/4 dia. hole
58E-12927	Mask
15B-12900-1	Window, safety glass
32B-13006-101	Assembly, loop antenna
31W-13288	Cabinet—Savoy (Type 7042-A1)
58-65	Domes of Silence
16-361	Clip and wing screw
46-115	Cable assembly, power

RF TUNER UNIT (TYPE 7033-A2)

Reference or Part No.	*Description*
34A-12897-101	Assembly—gear bracket
34A-12535-101	Assembly—pinion gear
15B-12565-102	Assembly—vernier television dial
15B-12564-102	Assembly—main television dial
31C-12495	Chassis—R.F. assembly
31C-12539	Cover, RF Chassis
4-93	Socket, tube: 7 prong miniature
4-67	Shield, long
4-72	Shield, short
10-249	Fibre washer #6
16-269	Board, term: single
16-1	Board, term: double
16-6	Terminal, lug: ring
10-265	Fibre washer
16-276	Terminal, lug: ring
16-278	Terminal, lug: ring
16-277	Terminal, lug; ring
6-502	Insulator—stand-off 3/8 x 1
31A-4871	Bracket: RF coupling
3B-12740-101	Assembly—capacitor group
34A-12897-101	Assembly—gear bracket
34A-12535	Pinion—gear
15B-1256A-101	Assembly—main dial
15B-12565-101	Assembly—vernier dial
31C-12495	Chassis
31C-12539	Cover
31A-12536	Bracket
15A-12537	Pointer
16A-13454	Plate, ground

TABLE MODELS CHATHAM (TYPE 7043-A1) AND STRATFORD (TYPE 7041-A1)

Drawing or Part No.	*Description*
31W-12898	Cabinet—Chatham (Type 7043-A1)
31W-12707	Cabinet—Stratford (Type 7041-A1)
15B-12900-1	Window, safety glass
58E-12927	Mask 12" CRT
53D-12540-101	Assembly, loud speaker
15A-12896-2	Knob
15A-12896-1	Knob
31-1380	Bracket, mounting of Eye Tube
15B-11363-101	Assembly, knob and handle
22D-13003-103	Assembly, back panel
22D-13003-101	Assembly, back panel
16A-12935	Clamp, back panel
10A-11122	Washer, felt: 1/4 I.D.
15B-12887	Window, Dial
28-52	Staple
28-51	Glazier's Point
4-121	Bezel assembly, tuning indicator
16-361	Clip and wing screw
46-114	Cable assembly, power

AM TUNER CHASSIS RA-103-A2

Reference or Part No.	*Description*
31E-12966	Chassis, A.M. Tuner
31B-12941	Bracket
31A-12940	Bracket
15A-12537	Pointer
15B-12984-101	A.M. Dial Assembly
26A-12989	Shield, light
7A-12942	Grommet, shock mount
13A-12952	Bushing
12-58	Lamp holder, miniature bayonet
4-3	Socket, tube, octal
4-113	Socket, tube, 7 prong miniature
7-29	Grommet, rubber, 1/4 mtg. hole
7-37	Strain relief
16-7	Terminal, lug, ring, No. 8
16-267	Board, terminal: 2 terminals
9-88	Connector, female, 2 contact
16-357	Board, terminal: 3 terminals
16-275	Board, terminal: 3 terminals
16-269	Board, terminal: 1 terminal
7-6	Grommet, rubber, 15/32 mtg. hole
30-723	Strain relief
13A-13364	Insulator sheet