

# DUMONT

*First with the Finest in Television*

**BLOCK DIAGRAM  
ADJUSTMENTS  
and  
TROUBLE SHOOTING  
for  
TELESET MODEL  
RA-111A**

**Putnam**

**Guilford**

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## BLOCK DIAGRAM and TROUBLESHOOTING

### INTRODUCTION

The purpose of this block diagram is to assist the serviceman in rapidly localizing troubles. It also provides a means for quickly familiarizing the serviceman with the functional details of the Teleset.

In analyzing trouble, especially in the home of a customer, it is essential that the serviceman quickly and accurately diagnose the cause of the difficulty. Since most troubles are caused by tubes, the use of this block diagram, in conjunction with the tube location chart stapled to the inside of the cabinet, will enable the serviceman to quickly remedy most faults.

The RA-111A schematic diagram was divided into as many sections as possible. The number of sections into which a television receiver may be divided depends upon the number of indications available within the Teleset. Thus, by carefully examining the operation of the Teleset, the indications observed in conjunction with the following information should point to the source of the trouble.

The 6T8 tube is shown on the schematic diagram as V203. Since this tube performs three different functions, it was divided on this block diagram into three separate designations, namely V203A, V203B, V203C. The purpose of this breakdown was merely to make the block diagram more accurate from a functional standpoint.

Obviously, a block diagram of this type is not fool-proof since certain defects can result in indications in more than one section at a time. It is, therefore, left to the intelligence of the serviceman to analyze the difficulty in any case not specifically covered here.

The following chart is a tabulation of the various sections and the type of difficulty caused by each section. Where no direct reference is made to the probable cause of defect, it is understood that all tubes within the confines of the section are possible causes. It is further understood that the only observed symptoms are those shown under the heading "Indications of trouble" and that only one trouble occurs at one time.

### 1. PIX AND SOUND SECTION

Indications of trouble:

- A. No picture and no sound.
- B. Weak picture (very snowy) and weak sound.
- C. The AGC clamp tube is shown in this section since it is part of the AGC circuit that controls the RF and mixer stages. If it becomes defective, except for a short, its effect may not immediately be noticed. However, operation of the tube in a non-conducting state may result in defective 6J6 or 6AK5 tubes.

### 2. SOUND IF SECTION

Indications of trouble:

- A. No sound output. Tuning indicator does not function as Teleset is tuned to a station.
- B. Weak sound output. Very little tuning eye deflection as Teleset is tuned.

### 3. AUDIO SECTION

Indications of trouble:

- A. No sound output. Tuning eye functions normally during tuning.

### 4. PIX AND SYNC SECTION

Indications of trouble:

- A. No picture. Raster not synchronized as indicated by vertical retrace lines moving through the raster.

### 5. PIX SECTION

Indications of trouble:

- A. No picture. Raster is synchronized as evidenced by vertical retrace lines remaining stationary when tuned to a station.

### 6. COMPOSITE SYNC SECTION

Indications of trouble:

- A. Loss of horizontal and vertical sync on both weak and strong signals. [Defective V219, V220A or Sync Detector half of V213.]
- B. Loss of horizontal and vertical sync plus loss of AGC. Loss of AGC will be apparent when tuned to strong stations which will overdrive the set. [Defective V212 or entire V213.]
- C. No AGC. Depending on the strength of the received signal, lack of AGC may result in the loss of horizontal and vertical sync. On the strongest stations, complete loss of horizontal and vertical sync will take place. On medium strength signals, bad vertical jitter and tendency of the horizontal to lose sync may result. On the weak signals (those not normally affected by AGC) the picture will be synchronized both horizontally and vertically. If the signal strength of all received stations is fairly high, the condition may be checked by inserting an attenuator in the transmission line. The attenuation should be sufficient to produce a "snowy" picture. If lack of AGC is the only difficulty, the picture will be synchronized. [Loss of AGC is caused by defective AGC detector half of V213.]

[See page 2 of the Installation section of the Service Notes for information on attenuators.] [In the above, reference to a defective half tube is meant to indicate a possible defect in that half of the circuit. Obviously, a defective half tube requires a replacement.]

### 7. HORIZONTAL SYNC, SWEEP, AND HIGH VOLTAGE SECTION

Indications of trouble:

- A. Loss of horizontal sync. V214 defective.
- B. No high voltage. Any one of the four tubes.

### 8. LOW VOLTAGE SECTION

Indications of trouble:

- A. No sound, picture or raster, tuning indicator does not glow. Defective fuse or 5U4G.

### 9. VERTICAL SWEEP SECTION

Indications of trouble:

- A. No vertical sweep or insufficient vertical sweep.

# SERVICE ADJUSTMENTS FOR DU MONT TELESET RA-111A

## GENERAL

All Du Mont Telesets are properly adjusted before they are shipped from the factory. It is possible, however, that during shipment certain of these adjustments will be disturbed and may require re-setting.

There are no electrical positioning controls used in the RA-111A Teleset. Positioning of the picture is accomplished by adjusting the position of the focus coil.

## ION-TRAP MAGNET ADJUSTMENT

(See Adjoining Illustrations)

**NOTE:** Accurate setting of the ion-trap magnet is highly important to insure optimum performance and normal life of the picture tube. The procedure should be carried out as rapidly as possible, to prevent damage to picture tube, and is not to be used as a picture positioning or screen coverage adjustment.

1. Start with the magnet about  $\frac{1}{2}$ " from the base of the tube.
2. Keep the Brightness Control at the lowest possible setting that will allow adjustment of the magnet.
3. Adjust the magnet by rotating it on the neck of the tube and sliding it back and forth for maximum illumination. Correct positioning of the magnet results in a decrease in brightness with movement of the magnet in any direction. (Two positions will be found; use position NEAREST BASE of tube).
4. Make final adjustment of magnet with Brightness Control set just below point where "blooming" (defocus) occurs.

## PICTURE POSITIONING ADJUSTMENTS RA-111A

(See Adjoining Illustration)

**Note 1:** Be sure that ion-trap magnet has been properly adjusted before attempting picture positioning.

1. Set 3 wingnuts (B) so that focus coil is spaced a minimum of  $\frac{1}{4}$ " from rear of deflection yoke at all points. When set properly, the focus coil should exhibit practically no tilt.
2. Tune to a TV station and make the necessary front panel adjustments for a good picture.
3. If picture requires positioning in a rotary direction, loosen thumbscrew (A) and rotate deflection yoke. When retightening, make sure yoke is full forward against cone of picture tube. This may be checked by applying forward pressure on rear of yoke cover while tightening (A).
4. Loosen 2 screws (C) holding focus coil mounting ring to yoke bracket and move focus coil assembly to position picture as correctly as possible. Up-and-down movement of focus coil assembly results in

horizontal positioning of picture, horizontal movement of focus coil assembly results in vertical positioning. Retighten screws (C). (Immediately reset ion-trap magnet if change in brightness occurs.)

5. Using 3 wingnuts (B), accurately position picture by UNSCREWING necessary wingnut(s). Vertical tilt of coil moves picture horizontally. Horizontal tilt of coil moves picture vertically. (Immediately reset ion-trap magnet if change in brightness occurs).

**Note 2:** If picture cutoff (shadowing) occurs, the tilt of the focus coil (wingnuts B) may have to be readjusted, followed by readjustment of the positioning (screws C). Do not attempt to eliminate cutoff (shadowing) or obtain screen coverage by adjustment of ion-trap magnet.

## ELECTRICAL ADJUSTMENTS

The following controls are located on the rear fold of the chassis. The identification of each is stamped adjacent to the control.

### VERTICAL HOLD

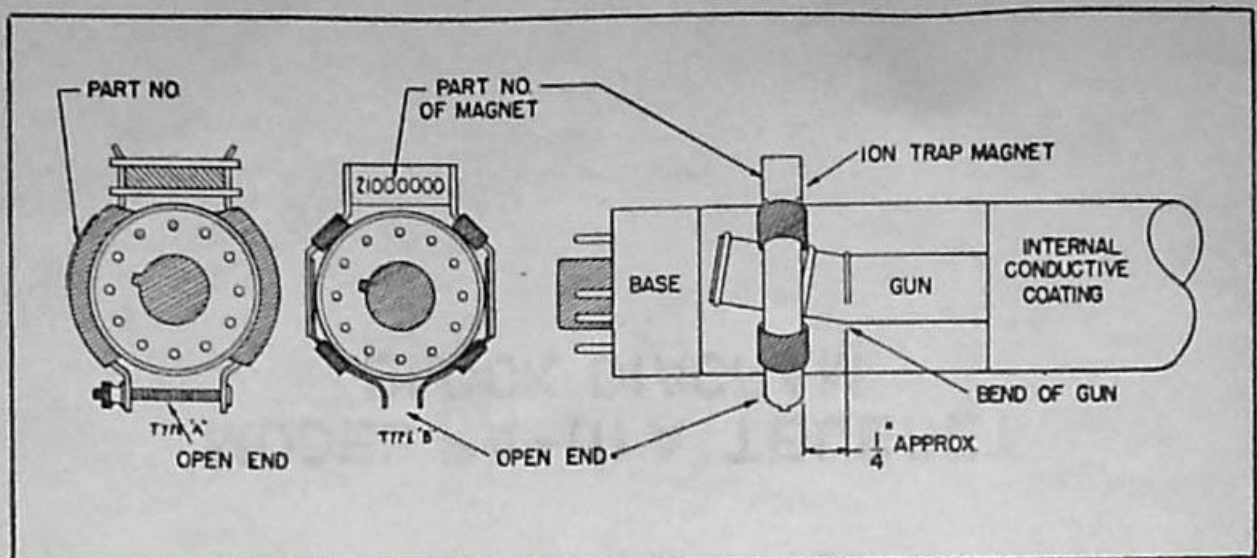
Rotate hold control until picture falls out of sync. Adjust control to bring picture back into sync and note point where this occurs. Rotate hold control until picture goes out of sync in direction opposite to that just described. Adjust control and note point where picture falls into sync. Correct setting is approximately half-way between the two points where picture falls into sync. A final adjustment should be made for best interlace.

### VERTICAL LINEARITY

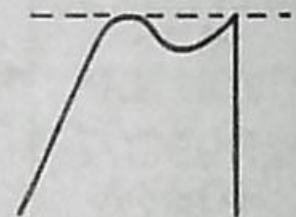
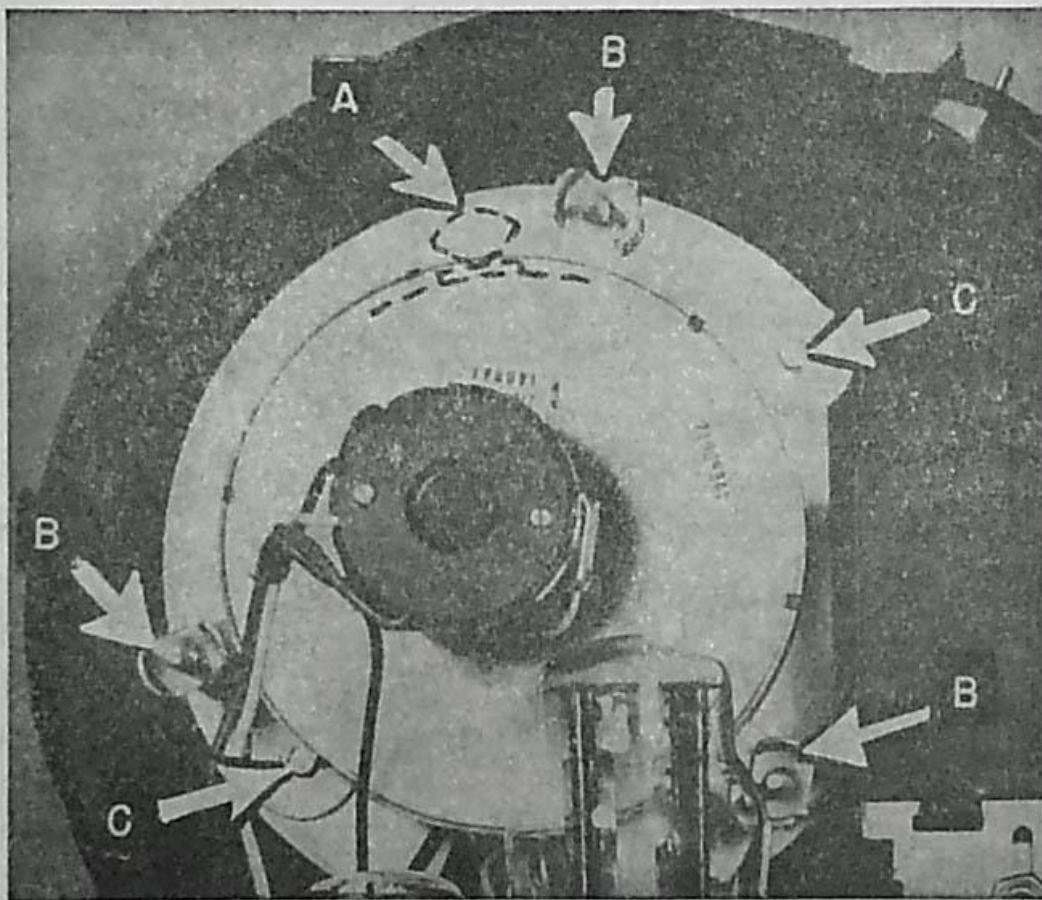
If vertical non-linearity is observed in the upper half of the picture, adjustment of this control should correct the condition.

### VERTICAL SIZE

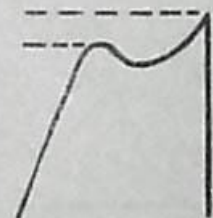
This control affects the linearity of the bottom half of the picture as well as affecting the size. For best linearity and proper size, the linearity and size controls should be adjusted in conjunction with one another.



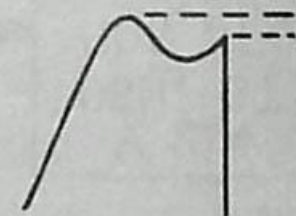
Types of ion-trap magnets used. (Thumbscrew of Type A should be tightened by hand only—do not use tools.)



CORRECT



INCORRECT



INCORRECT  
WAVEFORMS  
STEP NO. 6

## Horizontal Deflection and Synch Adjustments

### Important

The horizontal size, linearity and drive controls should always be set correctly before the final adjustments are made on the synchronization circuits. Any change in the horizontal drive capacitor will necessitate resetting of the horizontal synch adjustments. It is further recommended that all adjustments of the deflection and synch circuits be made at 117 volt line.

### Horizontal Deflection Adjustment

#### Procedure:

If the picture size is improper or if the horizontal linearity is off, one or more of the following controls must be readjusted as prescribed:

#### Horizontal Size

Adjustment of this control will change the picture size without affecting the linearity.

#### Horizontal Drive

This control affects the picture width and the linearity of the left side. This control should be adjusted in a clockwise direction to obtain maximum width and no bright vertical line on the left side of the raster. It should not be turned further clockwise from this point as it will result in loss of picture size and a larger amount of current drawn by the 6BQ6.

#### Linearity Adjustments

If any horizontal non-linearity exists in the picture the following controls should be adjusted as follows:

1. Turn linearity slug (lin 2) to minimum inductance (slug all the way out of coil).
2. Turn linearity pot (lin 1) to maximum resistance (completely counter clockwise).
3. Position picture so that the extreme right side of the raster may be seen. Adjust the horizontal hold control on the front panel until the leading edge of the synch pulse is at the extreme right side of the raster.
4. Turn linearity slug (lin 2) in until "packing" is just observed at the right edge of the picture (not raster).
5. Adjust the linearity pot so the linearity of the left third of the picture is equal to that of the center third.
6. Turn the linearity slug in another turn or until "packing" is again just seen at the right side of the picture. With this adjustment the picture should now have the desired linearity.
7. A slight adjustment of the horizontal drive capacitor in the counter-clockwise direction to bring in the left side of the picture is permissible if necessary, and if no bright vertical line appears.

#### Horizontal Synchronization Adjustments

1. Turn locking range capacitor C240A (marked "Freq.", and located at rear of horizontal-HV compartment) full clockwise.

2. Rotate waveform adjustment slug (top of Z210, between yoke mounting assembly and horizontal-HV compartment) full counter-clockwise then four turns clockwise.

3. Adjust front panel horizontal hold control full clockwise.

4. Rotate frequency slug (bottom) of Z210 until picture syncs.

5. Connect an oscilloscope through a 10 mmfd capacitor to terminal C of Z210 and ground.

6. Adjust internal sweep of oscilloscope to 15,750 cps and observe waveform composed of two peaks—one broad, one sharp. (See adjoining illustrations.) Carefully rotate waveform adjustment slug (top) of Z210 until two peaks are of equal amplitude. This adjustment must be made with picture in synch, and should require only a portion of a turn.

7. Remove scope and readjust frequency slug (bottom) of Z210, still keeping front panel control full clockwise. Proper adjustment of slug is with picture phased as far to right as possible without instability or "gear-tooth" effect appearing. Some blanking must appear at left side of picture.

8. Check to see that picture holds synch when front panel hold control is rotated completely counter-clockwise. If synch is not held over full range of control, it may be necessary to repeat 5, 6 and 7 (above). It is normal in this circuit to lose synch if the signal is interrupted while front panel hold control is in the counter-clockwise position of its range. This may be used as a check of the circuit adjustment, since when normal, 4 or 5 slanting black bars of horizontal blanking should be visible.

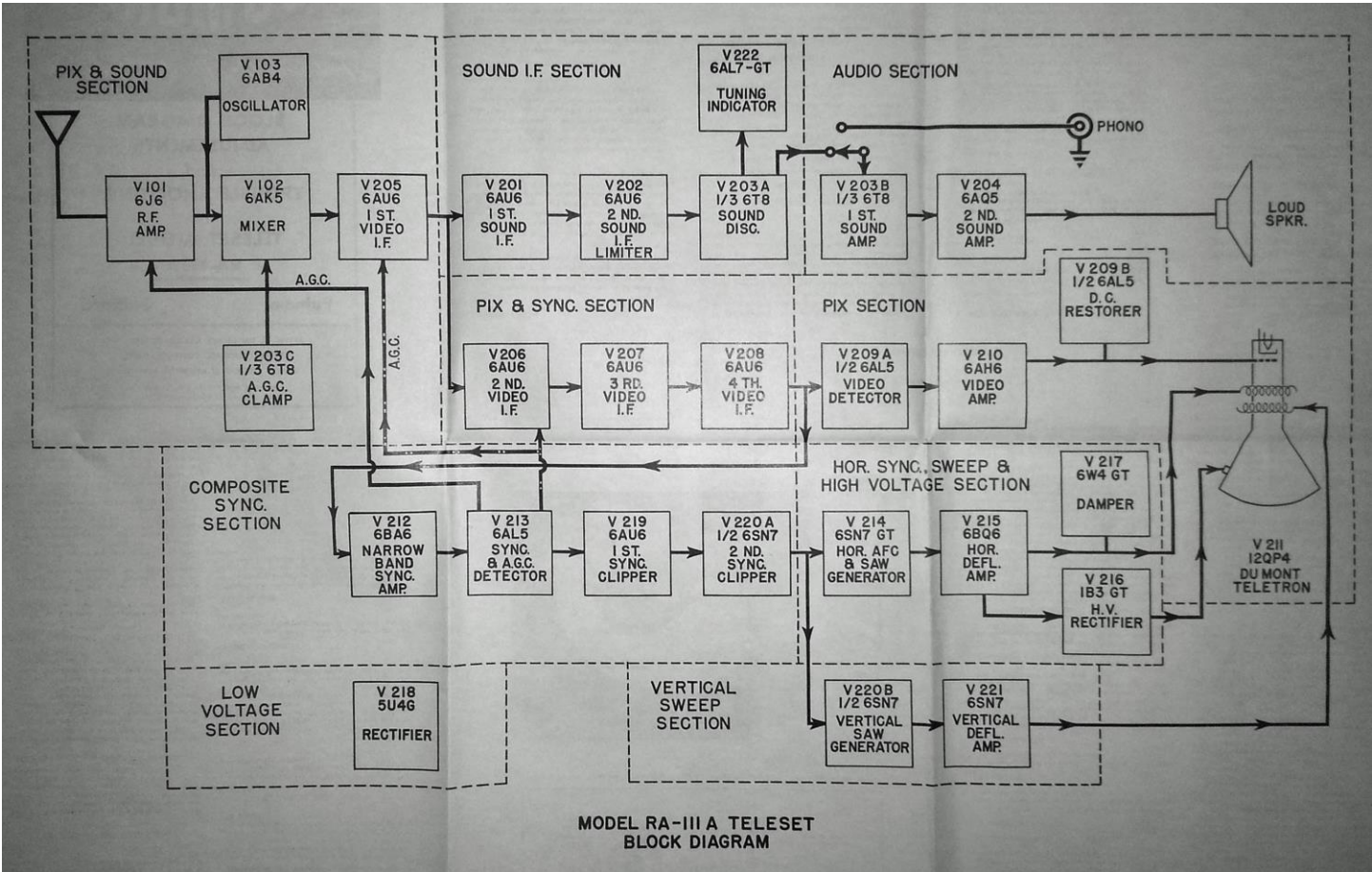
9. When above steps are completed, set front-panel hold control for stable synch (approximately mid-point of its rotation range), and make any necessary correction of picture positioning by using focus coil adjustment (See Picture Positioning instructions). Front-panel hold control is not intended as a positioning adjustment.

The AGC control is the only unmarked potentiometer type control in the RA-111A Teleset and is located on top of the chassis. When viewing the chassis from the rear, it is directly to the right of V203 (6T8) and under the CRT.

This control should be adjusted as per instructions on the Alignment Procedure sheet. An incorrect setting of this control may result in the following conditions.

If the set is located in the vicinity of a station, the set may overload on normal contrast setting. It is also possible for the top of the picture to tear out regardless of the contrast setting. If this occurs insufficient AGC voltage is developed and the control should be turned slightly clockwise to develop more AGC.

If control is turned too far CW the weak stations will be affected which is undesirable. Therefore, a balance between the point where the strong signal will overdrive the set and the weak signal is attenuated by AGC action must be made.



MODEL RA-III A TELEASET  
BLOCK DIAGRAM