THE FLEETWOOD MODEL 600 REMOTE TUNING TELEVISION SYSTEM

The FLEETWOOD Remote Receiver is designed for custom installation in a special cabinet, in the wall of a room, or into a recess or nook which may exist in the television viewing area. Its flexibility frees it from the usual requirement that the entire set be accessible for tuning. With the FLEETWOOD Remote system, it is quite practicable to place the viewing screen over a stairway, or over a buffet. The tuner, measuring only 7 x 11 1/2 inches, may be built into an end table, into a magazine rack, or placed wherever it may be of service with a minimum of effort on the part of the viewer. It may be mounted in any position, and its beautifully edgelit dial, in perfect taste, will add warmth and color to any room.

The system employs 27 tubes, and will accommodate any of the standard 21" or 24" magnetic focus picture tubes. The high voltage system employed will supply 18,000 volts nominally, resulting in extremely good spot focus and high brilliance. A cosine squared yoke insures uniform focus over the entire screen.

The picture chassis, when fitted with a 21" tube, can be mounted in a space 21" wide and 21" high. The 21AP4 picture tube is only 22 3/4" long, from the faceplate to the outside of the tube socket. This tube is recommended wherever space is at a premium; for installation in an existing cabinet, or an enclosure of limited size. When fitted with a 24" tube, the chassis can be mounted in a space 26" wide and 30" high. The 24" tube is 24" long from faceplate to the outside of the socket.

The following Kits are available as accessories to your Fleetwood Receiver:

601 A Kit for mounting a type 21AP4 Metal rectangular tube. This Kit includes:

- 1 - Plastic ring for the front of the picture tube.
- 1 - Plastic sleeve for the picture tube, with anode connector.
- 1 - Rubber band for the plastic ring.
- 1 - Tie down cable for the picture tube, 49" long.
- 1 - Set of blocks for the front of the picture tube.
- 4 - 8-32 x 3/4" self-threading screws for the blocks.
- 2 - Nuts for the tie down cable.

601 B Kit for mounting a 21" glass tube, either cylindrical or spherical faced. This Kit includes:

- 1 - Pair of support blocks for the front of the picture tube.
- 1 - Tie down strap for the front of the picture tube.
- 1 - Anode connector for the picture tube.
- 4 - 8-32 x 3/4" self-threading screws for the support blocks.
- 2 - Pieces of cork for the face of the support blocks.
- 2 - Phosphor Bronze Strips 1/4" x 2".
- 2 - #6-32 Self-threading screws.

604 A Kit for mounting a 24AP4 round metal tube. This Kit contains:

- 1 - Pair of side panels to support the yoke and focus coil.
- 1 - Pair of front tube support assemblies.
- 2 - 6-32 x 1/4" self-threading screws for the front support assemblies.
- 2 - 8-32 x 1/4" self-threading screws for the front support assemblies.
- 1 - Tie down cable for the front of the tube - 64" long.
- 1 - Plastic ring for the front of the tube
- 1 - Insulating sleeve for the tube, with anode connector.
- 1 - Rubber band for the plastic ring.

621 A Kit for framing a 21" metal picture tube. This Kit is assembled at the factory and is composed of the following items:

- 1 - Picture frame of Pacific Coast Birch, unfinished, sanded smooth, approximately 18 1/2" x 24 1/2" outside dimensions.
- 1 - Safety glass, 16" x 22" x 7/32", laminated.
- 1 - Mask for a 21AP4 type tube, gray-green in color.
- 4 - Clips for holding the assembled frame to the wall.

621 B Kit for framing a 21" Cylindrical Faced glass tube. This kit is assembled at the factory, and is identical with the 621 A Kit except for the mask, which will fit a Cylindrical Faced glass tube instead of the metal tube.

624 Kit for framing a 24" Round Metal Tube. This kit is assembled at the factory, and is composed of the following items:

- 1 - Picture Frame of Pacific Coast Birch, unfinished, sanded smooth, approximately 22" x 28" outside dimensions.
- 1 - Safety Glass, 20" x 26" x 7/32", laminated.
- 1 - Mask for a 24AP4 tube, gray-green in color.
- 4 - Clips for holding the assembled frame to the wall.

ELECTRICAL SPECIFICATIONS

PICTURE TUBE:	21AP4 Metal Rectangular or 24AP4 Metal Round
REMOTE PANEL CONTROLS:	Station Selector Fine Tuning Contrast Off-On-Volume

PICTURE CHASSIS

CONTROLS: FRONT:	Height Vertical Linearity Brightness Focus Horizontal Hold Vertical Hold
REAR:	Width Horizontal Drive Horizontal Linearity
I. F. FREQUENCIES:	Video 25.75 mc Audio 21.25 mc
BANDWIDTH:	4 mc
AUDIO OUTPUT:	1. 4.5 watts at terminals on Picture Chassis with volume control on remote tuner; 2. Ratio detector output; no volume control.
POWER:	117 Volts, 60 Cycle Picture tube chassis: 180 watts Remote tuner chassis: 55 watts
PICTURE TUBE ANODE VOLTAGE:	18 kv, design center

TUBE COMPLEMENT: (Remote Tuner)

1 - 6BQ7/6BK7	Cascode R.F. Amplifier
1 - 6J6	First Detector and Local Oscillator
1 - 6CB6	First I. F. Amplifier
3 - 6AU6	2nd, 3rd, and 4th I. F. Amplifiers
1 - 12AU7	Video Detector, AGC Rectifier, and 1st sound I. F. Amplifier
1 - 6AU6	2nd sound I. F. Amplifier
1 - 6AL5	Sound Ratio Detector
1 - 6AB4	Sound Cathode Follower
1 - 12AT7	Video Cathode Follower
1 - 6X4	Rectifier

TUBE COMPLEMENT: (Picture Chassis)

1 - 6AB4	Grounded Grid Video Input Stage
1 - 6AC7	Video Output Stage
1 - 6BE6	Sync Stripper and Noise Inverter
1 - 6SN7	Sync Phase Inverter and D.C. Restorer
1 - 6AL5	Horizontal Discriminator
1 - 6SN7	Vertical Oscillator
1 - 6S4	Vertical Output Amplifier
1 - 6SN7	Horizontal Oscillator
1 - 6CD6	Horizontal Amplifier
1 - 6W4	Horizontal Damper
1 - 1B3	High Voltage Rectifier
1 - 6AV6	Audio Input Amplifier
1 - 6V6	Audio Power Amplifier
1 - 5U4	Plate Supply Rectifier

WARNING – HIGH VOLTAGE

Extremely high voltages are used in the operation of this set. To avoid personal injury, extreme care should be exercised so that no contact is made with any components connected to the high voltage circuits. Do not operate the receiver with the high voltage compartment shield removed.

WARNING – PICTURE TUBE HANDLING

Particular care must be exercised when handling picture tubes due to their high vacuum and large surface area. The picture tube must not be struck, scratched, or subjected to more than moderate pressure at any time as fracture of the glass will result in an implosion of considerable violence capable of damaging both property and person.

DIMENSIONS

	Width	Height	Depth
PICTURE CHASSIS			
21" Chassis:	20 1/4	14 1/2	20 1/4
21" Chassis, tube mounted:	20 3/4	21	23 1/4
24" Chassis:	20 1/4	19	22 1/2
24" Chassis, tube mounted:	26	30	25 1/4
TUNER CHASSIS	11 1/2	7	8 1/2

INSTALLING A 21" METAL PICTURE TUBE (21AP4) USING 601 A KIT

1. Mount the front support blocks on the chassis, ridges forward, screwing the 8-32 x 3/4" self-threading screws through the blocks and into the holes found 1/2" from the front of the chassis.

2. Unpack the type 21AP4 picture tube and place it face down on a soft pad to protect it from being scratched. Place plastic sleeve over the tube away from the socket key. Bend the clip around the front edge of the rim of the picture tube.

3. With the plastic sleeve snug against the tube, wrap the plastic ring around the front rim of the tube, over the sleeve. Work the ring tightly around the tube. Secure the ring with the rubber band, which must lie flat in the groove.

4. Loosen the screws which hold the yoke mounting hood on top of the mounting panels, allowing the yoke to slip toward the rear of the chassis.

5. Set the picture tube, complete with its ring and plastic cover, in place on the chassis, using extreme caution not to damage the deflection yoke windings with the prongs of the picture tube as the base of the tube is guided through the yoke. The high voltage clip should be on your left as you face the tube. The ridges on the front mounting blocks should fit into the groove in the mounting ring.

6. Place the tie down cable in the groove in the plastic ring and pass the ends through the holes in the front corners of the chassis. Screw the nuts on the ends and tighten MODERATELY. These nuts need be only "finger tight" to secure the tube.

7. Solder anode connector to the end of the white wire extending through the front of the high voltage box. Snap this connector into the terminal in the plastic sleeve.

8. Loosen the wing screw protruding from the top of deflection yoke. Push the yoke mounting hood forward until the rubber rims engage the flare of the picture tube firmly. While holding the hood forward under moderate tension, tighten the two screws which fasten the hood to the top of the upright panels.

9. Push the deflection yoke forward until it also engages the flare of the picture tube, and tighten the wing screw in the top of the deflection yoke.

10. Clamp the Ion Trap Magnet around the neck of the picture tube, about 1/2" forward of the tube base.

11. Place the picture tube socket on the base of the picture tube. Dress the leads away from the tubes on the chassis, and also away from the picture tube.

INSTALLING A 21" GLASS TUBE USING A 601 B KIT

1. Mount the front support blocks on the chassis, screwing the 8-32 x 3/4" screws through the blocks and into the holes found 1/2" from the front of the chassis.

2. Remove the four screws which hold the yoke mounting panels to the chassis. Move the entire assembly (yoke, focus coil and panels) back 1 1/4", by putting the screws into the front set of holes in the panels.

3. Fasten the 2" x 1/4" grounding strips to front of yoke mounting panels, using 6-32 x 1/4" self-threading screws.

4. Place the pieces of cork on the faces of the front blocks. If desired, the cork may be cemented to the blocks.

5. Loosen the screws which hold the yoke mounting hood on top of the mounting panels, allowing the yoke to slide toward the rear of the chassis.

6. Set the picture tube in place on the blocks, using extreme caution not to damage the deflection yoke windings with the prongs of the picture tube as the base of the tube is guided through the yoke. The anode connection on the side of the picture tube should be on your left as you face the tube. The grounding strips must make connection with the coating on the outside of the tube.

7. Place the tie down strap over the top of the picture tube and pass the ends through the holes in the front corners of the chassis Screw the nuts onto the ends of the strap MODERATELY. These nuts need be only "finger tight" to properly secure the tube.

8. Loosen the wing screw protruding from the top of the deflection yoke. Push the yoke mounting hood forward until the rubber rim engages the flare of the picture tube firmly. While holding the hood forward under moderate tension, tighten the two screws which fasten the hood to the top of the upright panels.

9. Push the deflection yoke forward until it also engages the flare of the picture tube, and tighten the wing screw on top of the deflection yoke.

10. Clamp the ION TRAP MAGNET around the neck of the tube, about 1/2" forward of the base.

11. Place the picture tube socket on the base of the picture tube.

12. Dress the leads away from the tubes on the chassis, and also away from the picture tube.

13. Solder the anode connector onto the end of the white wire extending through the front wall of the high voltage box, and press connector into place on the picture tube.

INSTALLING A 24" TUBE USING A 604 A KIT

1. Mount the front support brackets on the chassis. Each front support bracket is mounted (wood side forward) with one 8-32 and one 6-32 self-threading screws. The screws are driven upward from beneath the chassis. The 8-32 screw goes through the hole in the corner of the chassis and engages the center hole in the bracket.

2. Remove the deflection yoke hood and the focus magnet assembly from the upright panels at the rear of the chassis. Remove the panels, and replace them with the taller panels supplied with the 24" mounting kit. Replace the deflection yoke and hood, leaving it loose and free to slip toward the rear of the chassis. Remount the focus magnet on the new panels.

3. Unpack the type 24AP4 tube and place it face down on a soft pad to protect it from being scratched. Place the plastic sleeve over the tube, with high voltage clip on the side of the tube away from the socket key. Bend the high voltage clip around the front edge of the rim of the tube.

4. With the plastic sleeve snug against the tube, wrap the plastic ring around the front of the tube, over the sleeve. Secure the ring with the rubber band, which must lie flat in the groove.

5. Set the picture tube, complete with its ring and sleeve on the chassis, using extreme caution not to damage the deflection yoke windings with the prongs of the picture tube as the base of the tube is guided through the yoke. The high voltage clip should be on your left as you face the tube. The front mounting pieces should fit into the groove in the mounting ring.

6. Place the tie down cable in the groove in the plastic ring, and pass the ends through the holes in the outside ends of the front mounting assemblies. Screw the nuts on the ends of the rod and tighten moderately.

7. Solder anode connector to the end of the white wire extending through the front of the high voltage box. Snap this connector into the terminal in the plastic sleeve.

8. Loosen the wing screw which holds the deflection yoke in the yoke mounting hood. Push the yoke mounting hood forward until the rubber rims engage the flare of the picture tube firmly. While holding the hood forward under moderate tension, tighten the two screws which fasten the hood to the top of the upright panels.

9. Push the deflection yoke forward until it also engages the flare of the picture tube, and tighten the wing screw which holds it in the yoke mounting hood.

10. Clamp the Ion Trap Magnet around the neck of the picture tube about 1/2" forward of the tube base.

11. Place the picture tube socket on the base of the picture tube. Dress leads away from the tubes on the chassis, and away from the picture tube.

ELECTRICAL CONNECTIONS

Connect the tuner chassis with the picture chassis, using the 40-foot cable provided. Connect a P.M. Type speaker to the speaker terminals on the picture tube chassis. Plug each unit into a 117 volt, 60 cycle source of power. Turn the system "ON" by clockwise rotation of the center control on the tuner chassis. The tubes in both chassis should now be lighted.

Set the brightness control on the picture chassis to maximum. Adjust the Ion Trap Magnet until the screen of the picture tube lights up. The Ion Trap may be rotated completely, and moved back and forth along the neck of the picture tube. Proper adjustment has been attained when the light on the face of the picture tube is at its maximum.

Connect an antenna to the antenna terminals on the tuner chassis, using 300 ohm twin lead. It should now be possible to tune in a station.

CENTERING THE PICTURE

Each FLEETWOOD system is operated at the factory with a standard picture tube and is properly adjusted. However, picture tubes vary slightly and, when first set up, the picture on your set may not be properly centered. Around the neck of the picture tube, to the rear of the deflection yoke, will be found a focus magnet. It is mounted on a shelf with a single wing nut and is adjustable laterally on the shelf. The shelf in turn is mounted with two wing nuts and is adjustable vertically. These adjustments permit centering the picture. If the picture must be raised, the focus coil must be raised. Similarly, if the picture must be moved to one side in order to be centered, the focus magnet must be moved in the same direction as it is necessary to move the picture.

After the picture has been centered, it will be necessary to readjust the Ion Trap. The Ion Trap MUST BE ADJUSTED FOR MAXIMUM SCREEN BRIGHTNESS ONLY, OR THE PICTURE TUBE WILL BE DAMAGED, OVER A PERIOD OF TIME. MAKE ALL CENTERING ADJUSTMENTS WITH THE FOCUS COIL.

To level the picture, loosen the wing screw above the deflection yoke and turn the yoke slightly. Keep the yoke pushed forward against the flare of the picture tube when tightening the wing screw.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS: These adjustments should be made only if a reliable test pattern is available from a station. During some parts of the day several stations may be transmitting test patterns, and their individual differences may be "averaged." Generally speaking, the "Vertical Linearity" controls the top portion of the picture, and can make the test pattern "flat headed" or "egg headed." After changing the Vertical Linearity, the height will probably have to be reset.

HORIZONTAL HOLD: If the stations should come in as a series of black and white bars running diagonally across the screen, adjust the Horizontal Hold. Do not center the picture with this control.

VERTICAL HOLD: Proper adjustment of this control will prevent the picture from "rolling" either up or down. When the Horizontal and Vertical Hold controls have been adjusted, they should not require re-setting for many months.

BRIGHTNESS: With no station tuned in, adjust this control so that the screen is nearly dark.

NORMAL OPERATION OF THE SYSTEM:

Select a station desired with the Station Selector Knob. Behind this knob is a FINE TUNING CONTROL. Turn this control counter-clockwise until the picture appears to be covered with a fine mesh pattern, or has "sound" in it. Turn the fine tuning control clockwise until this effect just disappears. This will be the point at which the picture will have a maximum of fine detail.

Adjust the CONTRAST control for the most pleasing picture. Too much contrast will give the picture a coarse appearance, while too little contrast will give the picture a "washed out" appearance.

OPERATION OF THE SYSTEM WITH A SEPARATE AUDIO SYSTEM:

On the rear of the tuner chassis is a jack marked DETECTOR OUTPUT, which may be used to supply audio to an external amplifier. In this case, the volume control in the tuner will not function, and the loudness or volume control in the external system must be used. It is important that the speaker terminals on the picture tube chassis be shorted with a wire at all times if there is no speaker connected to these terminals. Failure to do so may result in damage to the audio output transformer in the picture tube chassis.

CABINET CONSIDERATIONS

The FLEETWOOD picture chassis should always be mounted in a cabinet, or in an enclosure behind a wall. In either case, the face of the picture tube should be protected by a safety glass window. Suitable laminated safety glass, together with a Royalite Picture Mask and a mounting frame are available in the FLEETWOOD 621 Accessory Kit (for 21" tube); and the FLEETWOOD 624 Accessory Kit (for 24" tube). This safety glass should be mounted on a plywood panel not less than 1/4" thick. Panel layout drawings will be found in the back of this manual.

A piece of the plywood 2-1/2" x 10-1/2" should be salvaged from the panel cutout to make a matching cover for the secondary controls. Two spring clips are provided to hold the cover in place. This cover will rarely have to be opened after the set has been properly adjusted. If the set is housed in a cabinet, the back of the cabinet should be masonite. Ventilation should be provided by piercing the masonite with holes not larger than 1/4" in diameter, on centers not greater than 1/2".

In order that the longest possible life may be expected from the tubes and other components in the system, it is imperative that both chassis be installed in a manner that will provide adequate ventilation. The shelf on which the picture chassis is mounted should have an opening approximately ten inches square, near the center of the chassis. This opening should be covered with hardware cloth, or heavy screen.

MOUNTING THE TUNER

If the tuner is to be installed in a piece of furniture, check the thickness of the panel behind which it is to be installed. If the panel is not over 1/2" thick, the front panel and the bottom of the tuner may be removed and the dial bezel may be mounted directly on the panel.

An opening approximately 4" x 6" should be made in the shelf beneath the chassis for ventilation, and the opening should be covered with hardware cloth or heavy screen. Provision must also be made for ventilating the top of the chassis. At least 30 square inches of opening is recommended, at either the top, back, or sides of the tuner.

SERVICE NOTES

OSCILLATOR ADJUSTMENT

If the fine tuning control knob does not turn far enough to properly bring in a particular station, set the fine tuning control at the middle of its range. Turn the oscillator adjusting slug clockwise until the picture has "sound interference" in it. Turn slug counter-clockwise until this interference just disappears. This slug can be adjusted through the hole located one inch to the right of, and 1/4 inch above the station selector shaft. As the station selector is turned to a different station, a different slug will appear in the hole. Use a non-metallic screw driver. A fraction of a turn should be sufficient.

Should the slug "fall into" the coil form, remove the bottom tuner cover by pulling downward on its forward end, and remove the forward channel coil cartridge of the station concerned. Move the slug retaining spring out of its slot, and tap the coil assembly until slug slips forward. Set the retaining spring in place so that it rests firmly against the slug, and reassemble the tuner.

If the fine tuning is off in the same direction on all stations, due to replacing V2 (6J6), set the station selector on a station in the "high group" (11-13), set the fine tuning knob in the middle of its range. Turn C15 counter-clockwise until the picture has "sound interference" in it, then turn it clockwise until this interference just disappears.

I. F. ALIGNMENT – VIDEO

1. Connect the negative terminal of a 3-volt battery to the junction of C118 and R105; positive grounded.

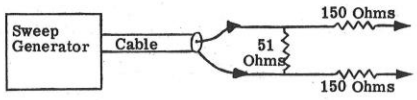
2. Connect the negative probe of a VTVM to point "A" at the "high" end of the contrast potentiometer; positive meter terminal to ground.

3. Connect signal generator having a 21-28 mc range, to pin #1 of V101 (6CB6) through a D.C. blocking condenser.

Adjust the following:

Coil	Frequency	Indication
T105 - Bottom Slug	27.25	Null
T101 - Bottom Slug	21.1	Null
T102	21.25	Null
T105 - Top Slug	25.5	Maximum
T101 - Top Slug	22	Maximum
L104	23	Maximum
L105	24.5	Maximum

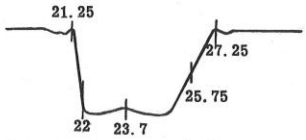
Replace the VTVM with an oscilloscope, and the signal generator with a sweep generator, adjusted to sweep 20-28 M.C. If necessary, re-adjust T101 (top), T105 (top), L104 and L105 to produce a curve approximately as shown:



Set marker generator to 23.7 and adjust L9 so that the dip produced by it is at 23.7 mc. Move the sweep generator lead to the output terminal of the tuner and adjust L101 for maximum response at 23.7 m.c.

TUNER ADJUSTMENT

Set sweep generator on channel 12 and feed the antenna terminals through a balancing network as shown:



Set station selector on channel 12 and adjust C6, C2 and C7 for maximum output and minimum tilt on top of curve.

I. F. ALIGNMENT — SOUND CHANNEL

1. Connect a voltmeter from the junction of R125 and R126 (point D) to ground. Tune in a station. Adjust T103, top and bottom, and T104 bottom for maximum reading. Connect the voltmeter between points C and D and adjust T104 top for zero voltage.

4 1/2 M.C. VIDEO TRAP ADJUSTMENT

With a station tuned in, turn the fine tuning control knob counter-clockwise until "sound interference" can be seen in the picture. Adjust L107 for a minimum of this interference.

HORIZONTAL OSCILLATOR ADJUSTMENTS:

1. Horizontal Linearity, L604:

   Connect a voltmeter across the cathode resistor of the 6CD6, R609, and adjust the Horizontal Linearity Coil, L604 for minimum voltage, while watching a standard test pattern. Proper adjustment will be attained when the two halves of the pattern are similar, and will be close to the point of minimum cathode voltage.

2. Horizontal Frequency, L603:

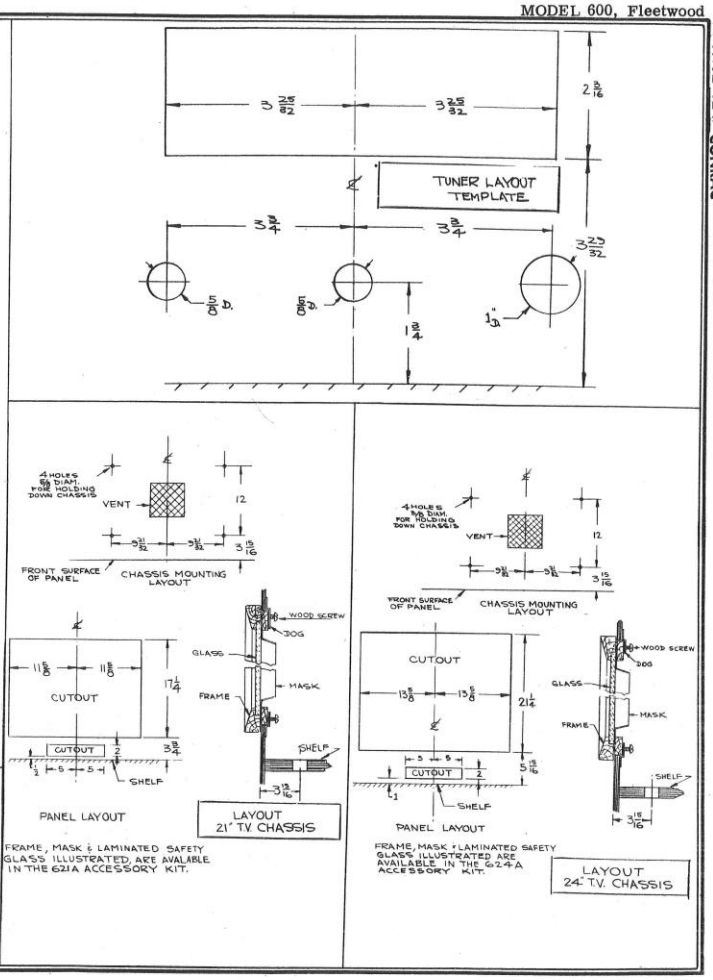
   With a station tuned in, temporarily ground the grid, pin #1, of V601, the horizontal oscillator. Set the horizontal hold in the middle of its range, and adjust L603 until the picture is nearly stopped. Remove temporary ground from pin #1, V601.

3. Horizontal Drive, C609:

   With a station tuned in, set contrast at its minimum, and brightness so that the screen is lighted. Turn C609 clockwise from the rear of the chassis (loosen) until a white vertical bar appears near the middle of the screen. Tighten (counter-clockwise) until the bar just disappears.

4. Width:

   Adjust so that 1/8" to 1/4" of the picture is off the screen on each side.



All resistors are 1/2 watt, 10% composition except as noted.

RESISTORS

Symbol No.	Description
R-615	3.9Ω, w.w.
R-302	10Ω, w.w.
R-431	51Ω 5%
R-430	100Ω
R-434	120Ω
R-608	150Ω
R-435	220Ω
R-207	270Ω
R-304	470Ω 1w
R-619, R-620	560Ω
R-609	300Ω 10w, w.w.
R-208	1000Ω 20% 2w
R-618	1000Ω
R-602	1500Ω 5%
R-512	2000Ω 1w
R-506	1800Ω
R-617	2200Ω 2w 20%
R-422	2700Ω
R-432	2700Ω 5%
R-421	3900Ω
R-309	3900Ω 2w
R-405	4700Ω 2w 5%
R-601, R-606	4700Ω 5%
R-310	5600Ω 2w
R-423	4700Ω
R-308	7500Ω 10w, w.w.
R-610	18KΩ 3w
R-433	10KΩ
R-611	10KΩ 1w
R-514	15KΩ
R-406, R-429, R-612	22KΩ
R-418	39KΩ
R-613, R-614	47KΩ
R-515	82KΩ
R-616, R-621	82KΩ 1w
R-301, R-410, R-424, R-425, R-416	100KΩ
R-203, R-507	220KΩ
R-603, R-604	180KΩ
R-409	330KΩ
R-415	390KΩ
R-205, R-427, R-408, R-426, R-607, R-419, R-436	470KΩ
R-505	250KΩ 1w
R-513, R-428	1 meg
R-509	1.2 meg
R-414, R-417	2.2 meg
R-202	10 meg

POTENTIOMETERS

Symbol No.	Description
R-511	3000Ω (Vert. Lin.)
R-305	3000Ω (Focus)
R-412	500K (Brightness)
R-605	100KΩ (Horiz. Hold)
R-508	250KΩ (Vert. Hold)
R-510	2 meg (Height)

VACUUM TUBES

Symbol No.	Description
V-404	6AL5
V-602	6CD6G
V-201	6AV6
V-202	6V6GT
V-301	5U4G
V-401	6AC7
V-501, V-601, V-403	6SN7GT
V-502	6S4
V-603	6W4GT
V-604	1B3GT
V-402	6BE6
V-406	6AB4
V-405	Kinescope

CAPACITORS

Symbol No.	Description
C-603	47mmf 10% 500V, mica
C-613	47mmf 10% 1KV, mica
C-409	220mmf 20%, mica
C-602	270mmf 5%, mica
C-410, C-411	500mmf 10%
C-611	500mmf 20KV
C-416	.0015mf 10%, mica
C-203	.004mf 600V, tubular paper molded
C-612, C-614	.01mf 600V, molded paper
C-201, C-412	.005mf 500V, ceramic disc
C-506, C-615, C-407	.006mf 600V, paper
C-601	.006mf 500V 10%, mica
C-505	.015mf 600V, paper
C-604	.01mf 600V, paper
C-414	.01, ceramic disc
C-609	700mmf, trimmer
C-202, C-510	.02mf 600V, paper
C-302, C-305	.022mf 600V
C-403, C-408, C-413, C-507, C-607, C-608	.05mf 600V, paper 20%
C-415	.22mf 600V, molded paper
C-404, C-606, C-509, C-616	.1mf 600V, paper
C-511	.25mf 600V, paper
C-605	.5mf 200V, paper
C-618	20mf 450V
C-508	50mf 50V, electrolytic
C-303A, C-303B/C406, C-303C, C-303D/C617	20x20x20x20mf 450V, electrolytic
C-304A/C204, C-304B/C205, C-304C/C610, C-304D	20x20x20mf 450V + 20mf 25V, elec.
C-301A, B	40x40mf 475V

COILS AND TRANSFORMERS

Symbol No.	Description
L-301	Filter choke
L-302	Focus coil, 1400Ω
L-404	Series peaking coil, 93μh
L-402	Shunt peaking coil, 450μh
L-403	Series peaking coil, 215μh on 22K res.
L-602	Width coil, 3-16μh
L-603	Ringing coil, 5.5-20μh
L-601	Deflection yoke, 18 1/2μh
L-604	Linearity coil, 1.5-8.3μh
T-201	Audio output
T-301	Power
T-501	Vertical output
T-601	Horizontal output

All resistors are 1/2 watt, 10% Composition except as noted.

RESISTORS

Symbol No.	Description
R-141	1.5Ω 1w, w.w.
R-102	51Ω 5%
R-104, R-110	68Ω 5%
R-106, R-112, R-113, R-115, R-117, R-120	150Ω
R-137	150Ω 10w, w.w.
R-123	270Ω
R-139	800Ω 10w, w.w.
R-105, R-107, R-114, R-122, R-135, R-133	1000Ω
R-140	2000Ω 10w, w.w.
R-138	3900Ω 1w
R-101	3300Ω 5%
R-108, R-111	4700Ω 5%
R-116	5600Ω 5% 1w
R-132	6800Ω 1w
R-103, R-109	10KΩ 5%
R-125, R-126	10KΩ
R-127	15KΩ 1w
R-124, R-128, R-136	22KΩ
R-121	100KΩ
R-118, R-119, R-129	470KΩ

POTENTIOMETERS

Symbol No.	Description
R-201	500KΩ (Volume) with switch
R-142	5000Ω (Contrast)

VACUUM TUBES

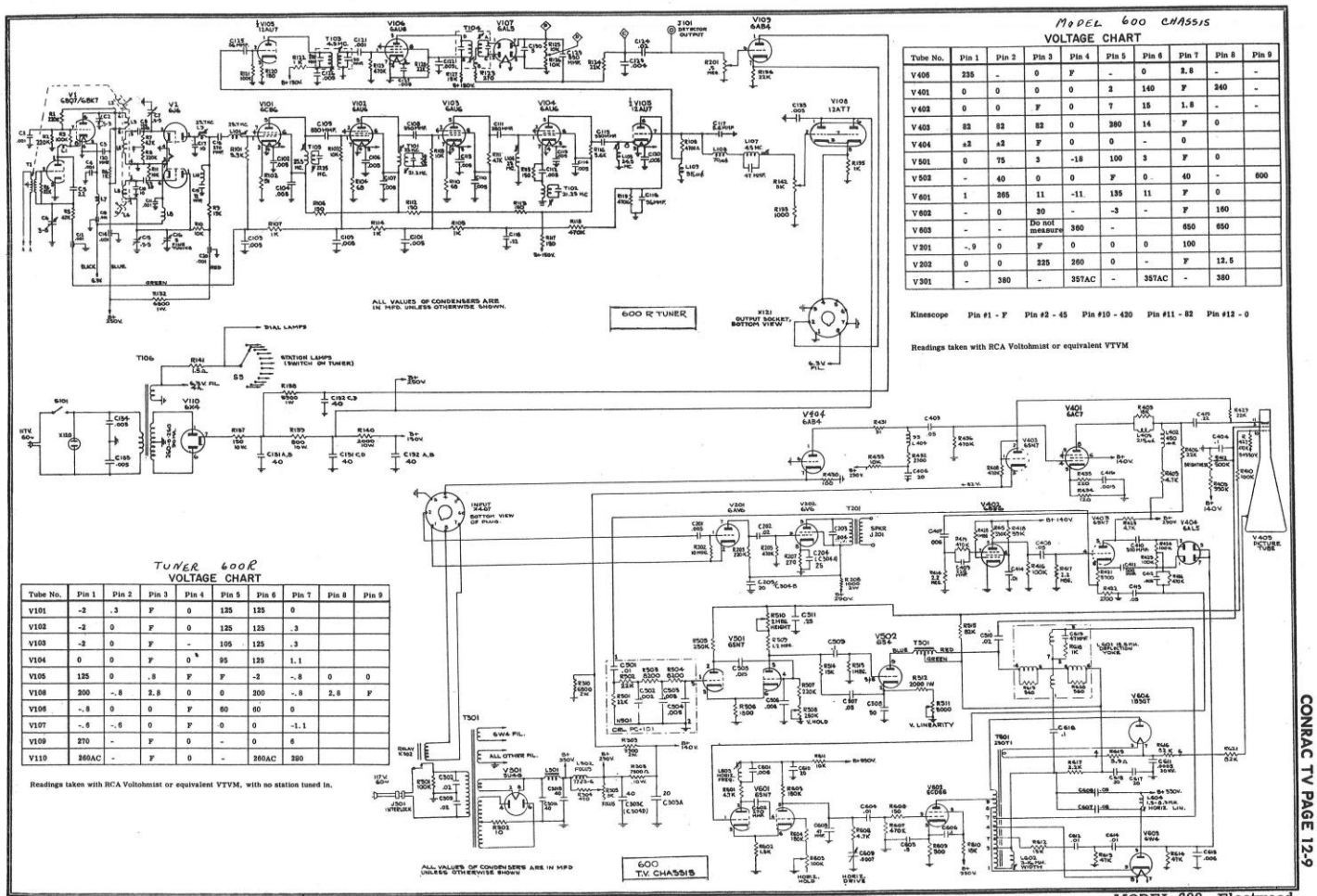
V-107	6AL5
V-102, V-103, V-104, V-106	6AU6
V-101	6CB6
V-105	12AU7
V-109	6AB4
V-108	12AT7
V-110	6X4

CAPACITORS

Symbol No.	Description
C-117	5.6mmf, ceramic tubular
C-116, C-125	56mmf, ceramic tubular
C-129	330mmf 10% mica
C-105, C-108, C-111, C-115	330mmf, ceramic tubular
C-121	1000mmf, ceramic tubular
C-123	.004mf 600V, tubular paper molded
C-101, C-102, C-103, C-104, C-106, C-107, C-109, C-110, C-113, C-114, C-119, C-120, C-122, C-126, C-127, C-112, C-133, C-134, C-135	.005mf, 500V, ceramic disc
C-124	.022mf 600V
C-118	.22mf 400V, paper molded
C-130	5mf 50V, electrolytic
C-131, C-132	20x20x20x20mf 450V, electrolytic

COILS AND TRANSFORMERS

Symbol No.	Description
L-104, L-105, L-101	I.F. Coil
L-107	Video trap coils 4.5 mc
T-105	#2 I.F. Coil with 27.25 mc trap
T-101	#3 I.F. Coil
T-102	Cathode Trap 21.25 mc
T-104	Ratio Det. Coil 4.5 mc
T-103	I.F. Transf. 4.5 mc
L-108	Series Peaking Coil 70 μh
L-109	35 μh Peaking Coil



MODEL 600 CHASSIS

VOLTAGE CHART

Tube No.	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 406	235	-	0	F	-	0	2.8	-	-
V 401	0	0	0	0	2	140	F	240	-
V 402	0	0	F	0	7	15	1.8	-	-
V 403	82	82	82	0	380	14	F	0	
V 404	±2	±2	F	0	0	-	0		
V 501	0	75	3	-18	100	3	F	0	
V 502	-	40	0	0	F	0	40	-	800
V 601	1	365	11	-11	135	11	F	0	
V 602	-	0	30	-	-3	-	F	160	
V 603	-	-	Do not measure	360	-		650	650	
V 201	-.9	0	F	0	0	0	100		
V 202	0	0	225	260	0	-	F	12.5	
V 301	-	380	-	357AC	-	357AC	-	380	

Kinescope Pin #1 - F Pin #2 - 45 Pin #10 - 420 Pin #11 - 82 Pin #12 - 0

Readings taken with RCA Voltohmist or equivalent VTVM

TUNER 600R

VOLTAGE CHART

Tube No.	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V101	-2	.3	F	0	125	125	0		
V102	-2	0	F	0	125	125	.3		
V103	-2	0	F	-	105	125	.3		
V104	0	0	F	0	95	125	1.1		
V105	125	0	.8	F	F	-2	-.8	0	0
V108	200	-.8	2.8	0	0	200	-.8	2.8	F
V106	-.8	0	0	F	60	60	0		
V107	-.6	-.6	0	F	0	0	-1.1		
V109	270	-	F	0	-	0	6		
V110	260AC	-	F	0	-	260AC	290		

Readings taken with RCA Voltohmist or equivalent VTVM, with no station tuned in.

FLEETWOOD MODEL 610 TELEVISION RECEIVER

The Fleetwood Model 610 Television Receiver is a Custom Quality chassis designed for installation into a wall, or for use in a special cabinet. It is especially suited for installations which include high fidelity sound systems and record players. Two types of audio output are provided, making it possible to connect the receiver into almost any sound system without circuit changes, or to operate a loud-speaker from the amplifier which is included in the 610 Receiver.

The Fleetwood 610 Receiver will accommodate a 21" or a 24" picture tube, either metal or glass. Kits are available, which will mount any of the standard types of tubes. When the Receiver has been fitted with the desired type of picture tube, it makes a complete package, with everything except the loud-speaker firmly mounted onto a single chassis The chassis may be mounted in any position. A set of knobs is supplied with the Fleetwood 610.

UHF Tuner strips are available which will enable the FLEETWOOD to receive any of the new Ultra High Frequency stations. A set of these strips replaces a set of coils which are not used in a particular locality. The Super Cascode turret type tuner with which your Fleetwood is equipped insures maximum sensitivity on any channel, in both the VHF and UHF bands. When properly fitted with the strips for the UHF stations in your locality, these channels can be tuned in as easily as the regular VHF channels. An extra position on the dial is provided to show UHF when such a station is tuned in. The panel light associated with the replaced coils can easily be moved to this UHF position behind the dial panel.

ELECTRICAL SPECIFICATIONS

PICTURE TUBE: (Not Supplied)	21AP4 21EP4 24AP4
CONTROLS:	Off-Volume Contrast Brightness Station Selector-fine tuning
SECONDARY CONTROLS:	Vertical Hold Horizontal Hold Height Vertical Linearity
SECONDARY CONTROLS: (Rear of Chassis)	Width Horizontal Drive Horizontal Linearity Focus
I. F. FREQUENCIES:	Video 25.75 Mc. Audio 4.5 Mc.
BANDWIDTH:	Video 4 Mc.
AUDIO OUTPUT:	1. Ratio detector output; no volume control. 2. 6V6 Power Amplifier with inverse feedback.
POWER:	117 Volts, 60 Cycles 210 Watts
PICTURE TUBE ANODE VOLTAGE:	18 kv, design center, 20.5 kv max.

TUBE COMPLEMENT:

1 - 6BQ7	Cascode RF Amplifier
1 - 6J6	First Detector & Local Oscillator
1 - 6CB6	First I. F. Amplifier
3 - 6AU6	2nd, 3rd, and 4th I. F. Amplifiers
1 - 12AU7	Video Detector, AGC Rectifier and 1st I. F. Amplifier
1 - 6AU6	2nd Sound I. F. Amplifier
1 - 6AL5	Ratio Detector
1 - 6AV6	1st Audio Amplifier
1 - 6V6	Audio Power Amplifier
1 - 6AC7	Video Amplifier
1 - 6BE6	Sync Stripper and Noise Inverter
1 - 6SN7	Sync Phase Inverter
1 - 6AL5	Horizontal Phase Discriminator
1 - 6SN7	Horizontal Oscillator
1 - 6CD6	Horizontal Amplifier
1 - 6W4	Horizontal Damper
1 - 1B3	High Voltage Rectifier
1 - 6SN7	Vertical Oscillator
1 - 6S4	Vertical Output Amplifier
1 - 5U4	Plate Supply Rectifier

WARNING - HIGH VOLTAGE

Extremely high voltages are used in the operation of this set. To avoid personal injury, extreme care should be exercised so that no contact is made with any components connected to the high voltage circuits. Do Not Operate the receiver with the high voltage compartment shield removed.

WARNING - PICTURE TUBE HANDLING

Particular care must be exercised when handling picture tubes due to their high vacuum and large surface area. The picture tube must not be struck, scratched, or subjected to more than moderate pressure at any time as fracture of the glass will result in an implosion of considerable violence capable of damaging both property and person.

DIMENSIONS

	Width	Height	Depth
Chassis:	20 1/4	14 1/2	20 1/4
Chassis, 21" tube mounted:	20 3/4	21	23 1/4
Chassis, 24" tube mounted:	26	30	25 1/4

UNPACKING

Remove the chassis from the shipping carton. A small package will be found in the carton, which contains a set of knobs, the Ion Trap for the neck of the picture tube, a pair of clips for holding a trap door in position over the secondary controls, and some small wood screws for mounting the clips onto the back side of the trap door. As soon as the receiver has been unpacked, examine it for any apparent damage which may have occurred in shipment. Should any damage be found, file a claim immediately with the carrier, stating the extent of the damage.

INSTALLING A 21" METAL PICTURE TUBE (21AP4) USING 601 A KIT

1. Mount the front support blocks on the chassis, ridges forward, screwing the 8-32 x 3/4" self-threading screws through the blocks and into the holes found 1/2" from the front of the chassis.

2. Unpack the type 21AP4 picture tube and place it face down on a soft pad to protect it from being scratched. Place plastic sleeve over the tube away from the socket key. Bend the clip around the front edge of the rim of the picture tube.

3. With the plastic sleeve snug against the tube, wrap the plastic ring around the front rim of the tube, over the sleeve. Work the ring tightly around the tube. Secure the ring with the rubber band, which must lie flat in the groove.

4. Loosen the screws which hold the yoke mounting hood on top of the mounting panels, allowing the yoke to slip toward the rear of the chassis.

5. Set the picture tube, complete with its ring and plastic cover, in place on the chassis, using extreme caution not to damage the deflection yoke windings with the prongs of the picture tube as the base of the tube is guided through the yoke. The high voltage clip should be on your left as you face the tube. The ridges on the front mounting blocks should fit into the groove in the mounting ring.

6. Place the tie down cable in the groove in the plastic ring and pass the ends through the holes in the front corners of the chassis. Screw the nuts on the ends and tighten MODERATELY. These nuts need be only "finger tight" to secure the tube.

7. Solder anode connector to the end of the white wire extending through the front of the high voltage box. Snap this connector into the terminal in the plastic sleeve.

8. Loosen the wing screw protruding from the top of deflection yoke. Push the yoke mounting hood forward until the rubber rims engage the flare of the picture tube firmly. While holding the hood forward under moderate tension, tighten the two screws which fasten the hood to the top of the upright panels.

9. Push the deflection yoke forward until it also engages the flare of the picture tube, and tighten the wing screw in the top of the deflection yoke.

10. Clamp the Ion Trap Magnet around the neck of the picture tube, about 1/2" forward of the tube base.

11. Place the picture tube socket on the base of the picture tube. Dress the leads away from the tubes on the chassis, and also away from the picture tube.

INSTALLING A 21" GLASS TUBE USING A 601 B KIT

1. Mount the front support blocks on the chassis, screwing the 8-32 x 3/4" screws through the blocks and into the holes found 1/2" from the front of the chassis.

2. Remove the four screws which hold the yoke mounting panels to the chassis. Move the entire assembly (yoke, focus coil and panels) back 1 1/4", by putting the screws into the front set of holes in the panels.

3. Fasten the 2" x 1/4" grounding strips to front of yoke mounting panels, using 6-32 x 1/4" self-threading screws.

4. Place the pieces of cork on the faces of the front blocks If desired, the cork may be cemented to the blocks.

5. Loosen the screws which hold the yoke mounting hood on top of the mounting panels, allowing the yoke to slide toward the rear of the chassis.

6. Set the picture tube in place on the blocks, using extreme caution not to damage the deflection yoke windings with the prongs of the picture tube as the base of the tube is guided through the yoke. The anode connection on the side of the picture tube should be on your left as you face the tube. The grounding strips must make connection with the coating on the outside of the tube.

7. Place the tie down strap over the top of the picture tube and pass the ends through the holes in the front corners of the chassis. Screw the nuts onto the ends of the strap MODERATELY. These nuts need be only "finger tight" to properly secure the tube.

8. Loosen the wing screw protruding from the top of the deflection yoke. Push the yoke mounting hood forward until the rubber rim engages the flare of the picture tube firmly. While holding the hood forward under moderate tension, tighten the two screws which fasten the hood to the top of the upright panels.

9. Push the deflection yoke forward until it also engages the flare of the picture tube, and tighten the wing screw on top of the deflection yoke.

10. Clamp the ION TRAP MAGNET around the neck of the tube, about 1/2" forward of the base.

11. Place the picture tube socket on the base of the picture tube.

12. Dress the leads away from the tubes on the chassis, and also away from the picture tube.

13. Solder the anode connector onto the end of the white wire extending through the front wall of the high voltage box, and press connector into place on the picture tube.

INSTALLING A 24" TUBE USING A 604 A KIT

1. Mount the front support brackets on the chassis. Each front support bracket is mounted (wood side forward) with one 8-32 and one 6-32 self-threading screws. The screws are driven upward from beneath the chassis. The 8-32 screw goes through the hole in the corner of the chassis and engages the center hole in the bracket.

2. Remove the deflection yoke hood and the focus magnet assembly from the upright panels at the rear of the chassis. Remove the panels, and replace them with the taller panels supplied with the 24" mounting kit. Replace the deflection yoke and hood, leaving it loose and free to slip toward the rear of the chassis. Remount the focus magnet on the new panels.

3. Unpack the type 24AP4 tube and place it face down on a soft pad to protect it from being scratched. Place the plastic sleeve over the tube, with high voltage clip on the side of the tube away from the socket key. Bend the high voltage clip around the front edge of the rim of the tube.

4. With the plastic sleeve snug against the tube, wrap the plastic ring around the front of the tube, over the sleeve. Secure the ring with the rubber band, which must lie flat in the groove.

5. Set the picture tube, complete with its ring and sleeve on the chassis, using extreme caution not to damage the deflection yoke windings with the prongs of the picture tube as the base of the tube is guided through the yoke. The high voltage clip should be on your left as you face the tube. The front mounting pieces should fit into the groove in the mounting ring.

6. Place the tie down cable in the groove in the plastic ring, and pass the ends through the holes in the outside ends of the front mounting assemblies. Screw the nuts on the ends of the rod and tighten moderately.

7. Solder anode connector to the end of the white wire extending through the front of the high voltage box. Snap this connector into the terminal in the plastic sleeve.

8. Loosen the wing screw which holds the deflection yoke in the yoke mounting hood. Push the yoke mounting hood forward until the rubber rims engage the flare of the picture tube firmly. While holding the hood forward under moderate tension, tighten the two screws which fasten the hood to the top of the upright panels.

9. Push the deflection yoke forward until it also engages the flare of the picture tube, and tighten the wing screw which holds it in the yoke mounting hood.

10. Clamp the Ion Trap Magnet around the neck of the picture tube about 1/2" forward of the tube base.

11. Place the picture tube socket on the base of the picture tube. Dress leads away from the tubes on the chassis, and away from the picture tube.

ELECTRICAL CONNECTIONS

Connect a PM type speaker to the speaker terminals on the chassis Connect an antenna to the antenna terminals, using 300 ohm twin lead. Plug the unit into a 117 volt, 60 cycle source. Turn the receiver on by clockwise rotation of the "off-volume" control. The tubes in the receiver should now be lighted. Set the brightness control to maximum (clockwise rotation). Adjust the Ion Trap Magnet until the screen of the picture tube lights up. The Ion Trap may be rotated completely, and moved back and forth along the neck of the picture tube. Proper adjustment has been attained when light of the face of the tube is at its maximum. It should now be possible to tune in a station.

CENTERING THE PICTURE

Each FLEETWOOD system is operated at the factory with a standard picture tube and is properly adjusted. However, picture tubes vary slightly and, when first set up, the picture on your set may not be properly centered. Around the neck of the picture tube, to the rear of the deflection yoke, will be found a focus magnet. It is mounted on a shelf with a single wing nut and is adjustable laterally on the shelf. The shelf in turn is mounted with two wing nuts and is adjustable vertically. These adjustments permit centering the picture. If the picture must be raised, the focus coil must be raised. Similarly, if the picture must be moved to one side in order to be centered, the focus magnet must be moved in the same direction as it is necessary to move the picture.

After the picture has been centered, it will be necessary to readjust the Ion Trap. The Ion Trap MUST BE ADJUSTED FOR MAXIMUM SCREEN BRIGHTNESS ONLY, OR THE PICTURE TUBE WILL BE DAMAGED, OVER A PERIOD OF TIME. MAKE ALL CENTERING ADJUSTMENTS WITH THE FOCUS COIL.

To level the picture, loosen the wing screw above the deflection yoke and turn the yoke slightly. Keep the yoke pushed forward against the flare of the picture tube when tightening the wing screw.

HEIGHT AND VERTICAL LINERARITY ADJUSTMENTS: These adjustments should be made only if a reliable test pattern is available from a station. During some parts of the day several stations may be transmitting test patterns, and their individual differences may be "averaged." Generally speaking, the "Vertical Linearity" controls the top portion of the picture, and can make the test pattern "flat headed" or "egg headed." After changing the Vertical Linearity, the height will probably have to be reset.

HORIZONTAL HOLD: If the stations should come in as a series of black and white bars running diagonally across the screen, adjust the Horizontal Hold. Do not center the picture with this control.

VERTICAL HOLD: Proper adjustment of this control will prevent the picture from "rolling" either up or down. When the Horizontal and Vertical Hold controls have been adjusted, they should not require re-setting for many months.

NORMAL OPERATION OF THE SYSTEM: Select a station desired with the Station Selector Knob. Behind this knob is a FINE TUNING CONTROL. Turn this control counter-clockwise until the picture appears to be covered with a fine mesh pattern, or has "sound" in it. Turn the fine tuning control clock-wise until this effect just disappears. This will be the point at which the picture will have a maximum of fine detail.

Adjust the CONTRAST CONTROL for the most pleasing picture. Too much contrast will give the picture a coarse appearance, while too little contrast will give the picture a "washed out" appearance.

Adjust the BRIGHTNESS for the amount of light desired.

OPERATION OF THE SYSTEM WITH A SEPARATE AUDIO SYSTEM: On the rear of the chassis is a jack marked DETECTOR OUTPUT, which may be used to supply audio to an external amplifier. In this case, the volume control on the receiver will not function, and the loudness or volume control in the external system must be used. It is important that the speaker terminals on the picture tube chassis be shorted with a wire at all times if there is no speaker connected to these terminals. Failure to do so may result in damage to the audio output transformer in the picture tube chassis.

CABINET CONSIDERATIONS

The FLEETWOOD picture chassis should always be mounted in a cabinet, or in an enclosure behind a wall. In either case, the face of the picture tube should be protected by a safety glass window. Suitable laminated safety glass, together with a Royalite Picture Mask and a mounting frame are available in the FLEETWOOD 621 Accessory Kit (for 21" tube); and the FLEETWOOD 624 Accessory Kit (for 24" tube). This safety glass should be mounted on a plywood panel not less than 1/4" thick. Panel layout drawings will be found in the back of this manual.

A piece of the plywood 2 1/2" x 10 1/2" should be salvaged from the panel cutout to make a matching cover for the secondary controls. Two spring clips are provided to hold the cover in place. This cover will rarely have to be opened after the set has been properly adjusted. If the set is housed in a cabinet, the back of the cabinet should be masonite. Ventilation should be provided by piercing the masonite with holes not larger than 1/4" in diameter, on centers not greater than 1/2".

In order that the longest possible life may be expected from the tubes and other components in the system, it is imperative that both chassis be installed in a manner that will provide adequate ventilation. The shelf on which the picture chassis is mounted should have an opening approximately ten inches square, near the center of the chassis. This opening should be covered with hardware cloth, or heavy screen.

SERVICE NOTES

OSCILLATOR ADJUSTMENT

If the fine tuning control knob does not turn far enough to properly bring in a particular station, set the fine tuning control at the middle of its range. Turn the oscillator adjusting slug clockwise until the picture has "sound interference" in it. Turn slug counter-clockwise until this interference just disappears. This slug can be adjusted through the hole located one inch to the right of, and 1/4 inch above the station selector shaft. As the station selector is turned to a different station, a different slug will appear in the hole. Use a non-metallic screw driver. A fraction of a turn should be sufficient.

Should the slug "fall into" the coil form, remove the bottom tuner cover by pulling downward on its forward end, and remove the forward channel coil cartridge of the station concerned. Move the slug retaining spring out of its slot, and tap the coil assembly until slug slips forward. Set the retaining spring in place so that it rests firmly against the slug, and reassemble the tuner.

If the fine tuning is off in the same direction on all stations, due to replacing V2 (6J6), set the station selector on a station in the "high group" (11-13), set the fine tuning knob in the middle of its range. Turn C15 counter-clockwise until the picture has "sound interference" in it, then turn it clockwise until this interference just disappears.

I. F. ALIGNMENT - VIDEO

1. Connect the negative terminal of a 3-volt battery to the junction of C118 and R105; positive grounded.

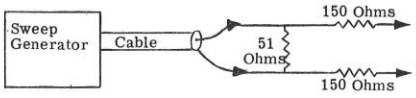
2. Connect the negative probe of a VTVM to pin #4 of the 6AC7 tube; positive meter terminal to ground.

3. Connect signal generator having a 21-28 mc range, to pin #1 of V101 (6CB6) through a D.C. blocking condenser.

Adjust the following:

Coil	Frequency	Indication
T105 - Bottom Slug	27.25	Null
T101 - Bottom slug	21.1	Null
T102	21.25	Null
T105 - Top Slug	25.5	Maximum
T101 - Top Slug	22	Maximum
L104	23	Maximum
L105	24.5	Maximum

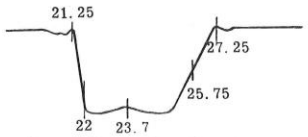
Replace the VTVM with an oscilloscope, and the signal generator with a sweep generator, adjusted to sweep 20-28 M.C. If necessary, re-adjust T101 (top), T105 (top), L104 and L105 to produce a curve approximately as shown:



Set marker generator to 23.7 and adjust L9 so that the dip produced by it is at 23.7 mc. Move the sweep generator lead to the output terminal of the tuner and adjust L101 for maximum response at 23.7 m.c.

TUNER ADJUSTMENT

Set sweep generator on channel 12 and feed the antenna terminals through a balancing network as shown:



Set station selector on channel 12 and adjust C6, C2 and C7 for maximum output and minimum tilt on top of curve.

I. F. ALIGNMENT - SOUND CHANNEL

1. Connect a voltmeter from the junction of R125 and R126 (point D) to ground. Tune in a station. Adjust T103, top and bottom, and T104 bottom for maximum reading. Connect the voltmeter between points C and D and adjust T104 top for zero voltage.

4 1/2 M.C. VIDEO TRAP ADJUSTMENT

With a station tuned in, turn the fine tuning control knob counter-clockwise until "sound interference" can be seen in the picture. Adjust L107 for a minimum of this interference.

HORIZONTAL OSCILLATOR ADJUSTMENTS:

1. Horizontal Linearity, L604:

   Connect a voltmeter across the cathode resistor of the 6CD6, R609, and adjust the Horizontal Linearity Coil, L604 for minimum voltage, while watching a standard test pattern. Proper adjustment will be attained when the two halves of the pattern are similar, and will be close to the point of minimum cathode voltage.

2. Horizontal Frequency, L603:

   With a station tuned in, temporarily ground the grid, pin #1, of V601, the horizontal oscillator. Set the horizontal hold in the middle of its range, and adjust L603 until the picture is nearly stopped. Remove temporary ground from pin #1, V601.

3. Horizontal Drive, C609:

   With a station tuned in, set contrast at its minimum, and brightness so that the screen is lighted. Turn C609 clockwise from the rear of the chassis (loosen) until a white vertical bar appears near the middle of the screen. Tighten (counter-clockwise) until the bar just disappears.

4. Width:

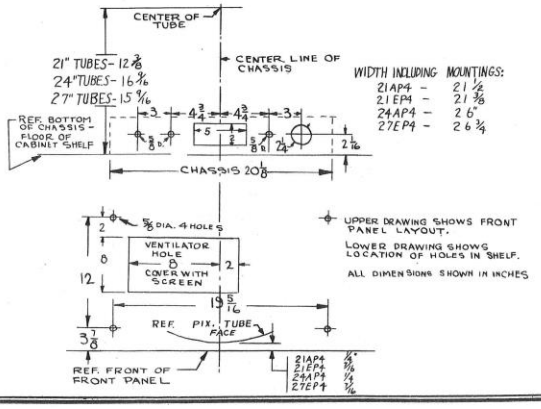
   Adjust so that 1/8" to 1/4" of the picture is off the screen on each side.

VOLTAGE CHART

Tube No.	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V101	-2	.3	F	0	125	125	0		
V102	-2	0	F	0	125	125	.3		
V103	-2	0	F	-	105	130	.3		
V104	0	0	F	0	95	133	1.1		
V105	125	0	1.6	F	F	-2	-.8	0	0
V106	-.8	0	0	F	60	60	0		
V107	-.6	-.6	0	F	0	0	-1.1		
V401	0	0	0	-.6	0/9	110/190	F	140/200	-
V402	-2	0	F	0	12	15	-1	-	-
V403	0	0	0	0	220	10	F	0	
V404	2.7	-4	F	0	0	-	0		
V501	0	75	3	-18	100	3	F	0	
V502	-	40	0	0	F	0	40	-	600
V601	±2	265	11	-11	135	11	F	0	
V602	-	0	30	-	-3	-	F	160	
V603	-	-	Do not measure	340	-		650	650	
V201	-.9	0	F	0	0	0	100		
V202	0	0	170	190	0	-	F	9	
V301	-	360	-	357AC	-	357AC	-	360	

Kinescope Pin #1 - F Pin #2 - 65 Pin #10 - 420 Pin #11 - 110 Pin #12 - 0

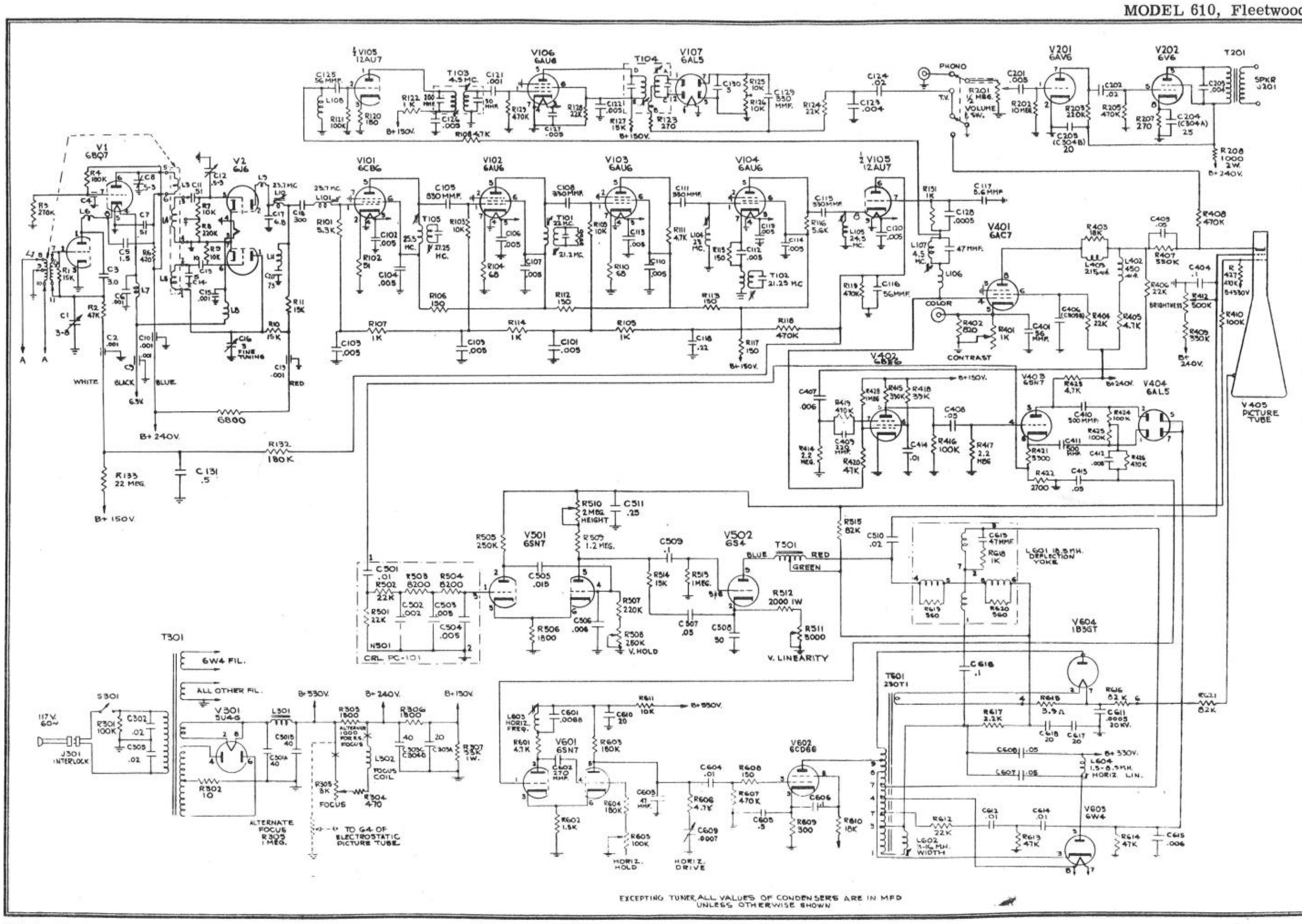
Readings taken with RCA Voltohmist or equivalent VTVM.



Symbol No.	Description
RESISTORS	
R615	3.9Ω 10% 1/2w, w.w.
R302	10Ω 10% 1/2w, w.w. Special
R102	51Ω 5% 1/2w
R104, R110	68Ω 5% 1/2w
R106, R112, R113, R115, R117, R120, R608	150Ω 10% 1/2w
R207	270Ω 10% 1/2w
R123	270Ω 10% 1/2w
R609	300Ω 10% 10w, w.w.
R304	470Ω 1w
R619, R620	560Ω 10% 1/2w
R402	820Ω 10% 1/2w
R105, R107, R114, R122, R131, R618	1000Ω 10% 1/2w
R208	1000Ω 2w
R602	1500Ω 5% 1/2w
R303, R306	1500Ω 10% 10w, w.w.
R512	2000Ω 10% 1w
R506	1800Ω 10% 1/2w
R617	2200Ω 2w
R422	2700Ω 10% 1/2w
R421	3900Ω 10% 1/2w
R101	3300Ω 5% 1/2w
R405	4700Ω 10% 2w
R108, R111, R601, R606	4700Ω 5% 1/2w
R116	5600Ω 5% 1w
R423	4700Ω 10% 1/2w
R610	18KΩ 10% 3w
R103, R109	10KΩ 5% 1/2w
R125, R126	10KΩ 10% 1/2w
R611	10KΩ 10% 1w
R514, R612	15KΩ 10% 1/2w
R127	15KΩ 10% 1w
R124, R128, R406	22KΩ 10% 1/2w
R404	22KΩ 10% 1w
R307	33KΩ 10% 1w
R418	39KΩ 10% 1/2w
R613, R614, R420	47KΩ 10% 1/2w
R515	82KΩ 10% 1/2w
R616, R621	82KΩ 10% 1w
R121, R301, R410, R424, R425, R416	100KΩ 10% 1/2w
R203, R507	220KΩ 10% 1/2w
R603, R604	180KΩ 10% 1/2w

Symbol No.	Description
R407, R409	330KΩ 10% 1/2w
R415	390KΩ 10% 1/2w
R118, R119, R129, R205, R427, R408, R426, R607, R419	470KΩ 10% 1/2w
R505	250KΩ 10% 1w
R513, R428	1megΩ 10% 1/2w
R509	1.2megΩ 10% 1/2w
R414, R417	2.2megΩ 10% 1/2w
R202	10megΩ 10% 1/2w
CONTROLS	
R511	3000Ω Vert. Lin.
R305	3000Ω Focus, w.w. 4w
R412	500K Brightness
R605	100KΩ Horiz. Hold (Height)
R508	250KΩ Vert. Hold
R401	1KΩ Contrast
R201	500KΩ Volume w/switch
R510	2megΩ Height
CAPACITORS	
C117	5.6mmf 10%, ceramic tubular
C603	47mmf 10% 500V, mica
C613	47mmf 10% 1KV, mica
C116, C125, C401	56mmf, ceramic tubular GP
C409	220mmf, mica
C602	270mmf 5%, mica
C129	330mmf 10%, mica
C105, C108, C111, C115	330mmf, ceramic tubular GP
C128	500mmf 10%, mica
C410, C411	500mmf 10%
C611	500mmf 20KV
C121	1000mmf, ceramic tubular GP
C123, C203	.004mf 600V, tubular paper molded
C612, C614	.002mf 600V, molded paper
C101, C102, C103, C104, C106, C107, C109, C110, C113, C114, C119, C120, C122, C126, C127, C201, C412, C112	.005mf 500V, ceramic disc
C506, C615, C407	.006mf 600V, paper
C601	.006mf 500V 10% Zero Temp.
C505, C604	.01mf 600V, paper

Symbol No.	Description
C414	.01mf ceramic disc
C609	700mmf, trimmer
C202, C510	.02mf 600V, paper
C124, C302, C305	.022mf 600V, molded
C403, C408, C413, C507, C607, C608	.05mf 600V, paper
C118	.22mf 400V, molded paper
C404, C606, C509, C616	.1mf 600V, paper
C511	.25mf 600V, paper
C605	.5mf 200V, molded paper
C130	5mf 50V, electrolytic
C618	20mf 450V
C508	50mf 50V, electrolytic
C303A, C303B/ C406, C303C, C303D/C617	20x20x20x20mf 450V, electrolytic
C304A/C204, C304B/C205, C304C/C610, C C304D	20x20x20mf 450V plus 20mf 25V, electrolytic can
C301A, C301B	40x40mf 475V
COILS	
L104, L105, L101	I.F. Coil
L107	Video Trap Coils 4.5 mc
T105	#2 I.F. Coil with 27.25 mc Trap
T101	#3 I.F. Coil
T102	Cathode Trap 21.25 mc
T104	Ratio Det. Coil 4.5 mc
T103	Sound I.F. Transf. 4.5 mc
L301	Filter Choke
L302	Focus Coil
L106	Peaking Coil 150mh on 10K res.
L402	Shunt Peaking Coil 450mh
L403	Series Peaking Coil 215mh on 18K res.
L602	Width Coil 3-16mh
L603	Ringing Coil 5.5-20mh
L601	Deflection Yoke
L108	Peaking Coil 250mh
L604	Linearity Coil 1.5-8.3mh
TRANSFORMERS	
T201	Audio Output - Single 6V6 to 3.2Ω voice coil
T301	Power
T501	Vertical Output 18:1 Ratio
T601	Horizontal Output
NETWORKS	
N501	Vertical Integrator


V1
6BQ7
V2
6J6
V101
6CB6
V102
6AU6
V103
6AU6
V104
6AU6
½ V105
12AU7
V106
6AU6
V107
6AL5
T103
4.5 MC.
T104
T101
T102
21.25 MC
T105
PHONO
T.V.
R201
½ MEG.
VOLUME
SW.
V201
6AV6
V202
6V6
T201
SPKR
J201
V401
6AC7
COLOR
CONTRAST
BRIGHTNESS
V402
6BE6
V403
6SN7
V404
6AL5
V405
PICTURE
TUBE
B+ 240V.
B+ 150V.
WHITE
BLACK
BLUE
RED
FINE TUNING
6800
R132
180K
R133
22 MEG.
C131
.5
V501
6SN7
V502
6S4
T501
BLUE
RED
GREEN
R510
2 MEG.
HEIGHT
V. HOLD
R512
2000 1W
R511
5000
V. LINEARITY
CRL. PC-101
L601 18.5 MH.
DEFLECTION
YOKE
V604
1B3GT
T601
250T1
T301
6W4 FIL.
ALL OTHER FIL.
S301
117 V.
60~
J301
INTERLOCK
V301
5U4G
L501
B+ 550V.
L502
FOCUS COIL
FOCUS
ALTERNATE
FOCUS
R305
1 MEG.
TO G4 OF
ELECTROSTATIC
PICTURE TUBE
L603
HORIZ.
FREQ.
V601
6SN7
HORIZ.
HOLD
HORIZ.
DRIVE
V602
6CD6G
L602
WIDTH
V603
6W4
L604
1.5-8.5 MH.
HORIZ. LIN.
EXCEPTING TUNER, ALL VALUES OF CONDENSERS ARE IN MFD
UNLESS OTHERWISE SHOWN