SERVICE MANUAL

For

Regency Model 6205

Electronic Chord Organ Built by Electro-Voice, Inc.

This Service Manual is intended specifically for use by service technicians of Electro-Voice dealers in servicing the Regency Model 6205 electronic chord organ.

The Electro-Voice Organ Guarantee

The following guarantee applies to the Regency Model 6205 electronic chord organ built by Electro-Voice. It is printed in the Owner's Manual which is supplied with each organ.

> The Regency organ is guaranteed for one year from date of purchase by original owner to be free from any defect in workmanship or material. Electro-Voice, Incorporated agrees to repair and replace, at its option, within that year, any part used in its manufacture. Finishes are excepted. All transportation charges incurred in the carrying out of the terms of this guarantee are to be borne by the purchaser.
>
> This guarantee becomes void if the organ is in any way subjected to treatment other than the normal use and care as outlined in the Owner's Manual, or if unauthorized parts or service are employed or if there is evidence that the serial number has been removed, defaced, or changed. This guarantee is in lieu of all other guarantees, expressed or implied, and no representative or person is authorized to assume for Electro-Voice any liability in connection with the sale of the Regency Model 6205 electronic chord organ.

The dealer implements the guarantee on all organs, whether or not the one-year period is applicable, by removing from the organ any modular unit which is defective and replacing it with a similar working module. The defective module is then returned to Electro-Voice, who will then repair or replace the module before returning it to the dealer. A nominal handling charge will be made by Electro-Voice on all modules covered by the one-year guarantee period; an appropriate charge for labor and materials is made on all modules replaced in units which are out of warranty.

Tubes and loudspeakers are included in the one-year guarantee. Should these items become defective, they should be returned to Electro-Voice who will make replacement at no charge.

The cabinet woodwork is guaranteed only against defects which are caused by manufacturing errors.

Damage to the organ after it leaves the Electro-Voice factory cannot be handled under guarantee. Claim should be made against the carrier for all damage incurred during transportation.

NOTE CAREFULLY: This manual includes instructions and warnings concerning certain types of repair operations which persons not directly employed by Electro-Voice are unauthorized to perform. Contravention of these rules may, at the option of Electro-Voice, entirely or partially void the guarantee.

Limits of Field Service

The Regency Model 6205 organ is manufactured in modular form. This means that each of the major components of the organ is a separate assembly which can be removed easily from the organ and replaced.

Replacement parts are available from the Electro-Voice Organ Service Department, and the order should include the model and serial number and customer's name.

Repairs made to Regency organs outside the factory should, therefore, be confined almost entirely to

Tube replacement,
Replacement of complete modules,
Readjustment of potentiometers for tuning purposes.

The only exceptions to this rule cover such actions as resoldering of a wire which may have been broken through rough handling and similar very minor electrical work.

Servicing Procedure

When an organ owner reports that his instrument is faulty, the following procedure is normal:

The dealer's service technician visits the customer's home and determines which module is responsible for the trouble.

If the trouble is in a tone generator and appears to be the result of bad tuning, the technician adjusts the controls on the back of the instrument as described in the chapter on Tuning Adjustment.

If such adjustment does not cure the problem, a new 12AX7 tube is inserted in the faulty generator.

If a new tube does not cure the trouble, the ailing generator is removed as a module; a new one of identical designation is installed and, if necessary, adjusted.

If the amplifier-power supply appears to be at fault, the technician may attempt to repair by changing appropriate tubes. If this is not effective,

the power-amplifier subassembly is removed and replaced by a new one.

NOTE: If a generator module or amplifier-power supply is replaced, or if a generator tube is replaced, the tuning of the generator should be checked and, if necessary, adjusted.

If loudspeaker, swell shoe, or keyboards are defective, new components are substituted for the bad ones. If the technician is experienced and sees an obvious and easily repaired cause for the fault without disassembling the individual unit, he may make a simple repair; but he does so at his own risk, as improper repair may void the guarantee.

If the front panel chord switch and tone selector switch or swell shoe potentiometer is faulty, the technician will replace the unit with one bearing the same stamped identification number as supplied by Electro-Voice Organ Service Department. Use of controls other than those furnished by Electro-Voice voids the guarantee.

Theory of Operation

This section gives a technical explanation of how the Regency Model 6205 electronic chord organ operates. While an understanding of the organ's functioning is not essential to servicing, it will be of great help in diagnosing trouble and locating the section at fault. The circuit diagrams given in connection with this section are only for the purpose of explanation and are not complete; a complete schematic diagram is to be found inside the rear cover of this manual, and that diagram should be used for actual servicing when a diagram is required. Most service problems, however, can be solved efficiently through the use of the sections on component removal and replacement and on trouble-shooting. Each technician should read the Owner's Manual, since the information contained therein is not generally repeated here.

The Regency electronic organ is a chord organ with 37 solo notes and 16 chord buttons. In addition, 8 bass keys are provided to enhance the accompaniment section. The organ consists of 12 electron tubes, 2 transistors, 16 signal diodes, and 2 power supply silicon diodes. The unit consumes approximately 57 watts and must be powered from an AC source of 105-125 volts/60 cycles. An internal 12-inch speaker and foot-operated swell shoe are incorporated in the unit. Four tonal voices are supplied in the solo manual section, and a diapason voiced chord section is provided. An automatic bass feature permits the operator to produce four-note chords with the chord buttons only. The four-note chord consists of the original three-note chord and bass tone. A switch is provided to disable this feature so that the bass keys can be operated separately from the chord buttons.

SOLO SECTION: The solo keyboard, which consists of 37 keys, is directly associated with the solo tone generator sections. The tone generators are broken up into three modules, each module being of similar design to the others but with differing component values. Since the 37-note keyboard covers a range of three octaves, a single octave tone generator is provided per module. Each model consists of four identical triode phase shift oscillator circuits. Two 12AX7 type tubes accomplish this and are seen on the schematic as V201, V202, V301, V302, V401, V402. The phase shift R-C oscillator has one resistance arm variable so that the oscillating frequency can be changed in the tuning process. Reference will be made to the V201A circuit, but the discussion will hold for all four mentioned tube sections. The variable resistor R201 is one of the quad sections which is accessible at the rear of the organ for tuning purposes. The other resistors associated with the oscillating circuit are R201A, R209, R213, R217. The grid resistor to complete the phase shift network is provided on the keyboard switchers and is not shown in the module drawing. More will be said in reference to this later.

The output from the phase shift oscillator passes through the coupling condenser C205 and resistor R209. From there it passes to a clipping diode circuit consisting of D201, C201, R205. Since an output waveform with harmonics is needed in a formant type organ so that the various voices can be achieved, the sine wave characteristic must be altered. The wave shaping network just described, in effect, rectifies the signal as a half-wave rectifier, and, in so doing, provides numerous higher harmonics of the fundamental oscillating frequency. The outputs from the oscillators are connected to a common buss and are brought out of the module printed circuit board and sent on to the voicing filters.

The keyboard consists of the key manual and associated mechanical arrangement, plus a series of single pole, single throw, normally-closed switches. These switches are located under the manual on a printed circuit type mounting board. Resistors are also provided on this printed circuit board which are the grid resistors of the phase shift oscillator. Since this organ works on the sharing-oscillator principal, it uses one oscillator tube controlling three adjacent notes on the keyboard. Therefore, by changing the grid resistor for this tube by a small amount, the three semi-tones can be reproduced from the same oscillator. This is seen in the key switch section in the lower right hand area of the schematic. The three key switches which control the V201A oscillator section are R225, R226, and R227 with their associated normally closed switches 1, 1, and 2. When none of these manual keys are depressed, all three switches are closed and wired in a series arrangement, one side of the series arrangement going to the grid of V201A,

and the other to a common buss which eventually returns to the vibrato oscillator output circuit. For purposes of circuit analysis, consider this buss to the vibrato oscillator as being at ground potential. Therefore, with no key depressed, the grid of V201A is returned through the switches directly to ground, and therefore, oscillation in the tube is impossible. With the opening of either the 1, ♯, or 2 switch, the ground is removed, from the grid and a resistor is placed in the circuit, causing the oscillator to function. If the ♯ switch (the second switch from the left) is opened, we see that R225 is shunted by R226 and this is now in the grid circuit. R227 is not in the circuit. Therefore, the resistance from grid to ground when the second key is depressed is slightly less than that when the first key is depressed due to the shunting action of R226. If the 2 key is depressed, all three resistors are connected in parallel across the grid to ground. The frequency of the oscillator is changed in semi-tones as we progress up the keyboard.

If two or more of the three switches are depressed, the lowest note depressed will be the one that is sounded, and no dischord will be present. In like manner the remaining eleven oscillator sections are connected to similar circuits. The only exception to the three-note sharing arrangement is at the top of the keyboard where the last four notes are shared instead of three. This is because of an extra C on the organ as the top key.

The resistors under the keyboard are selected with great precision to insure proper tuning of the shared-oscillator sections. For this reason, accurate 2% carbon film resistors are used. The basic oscillator, due to circuit and tube variations, is adjusted so that the oscillator functions at its correct frequency, when the middle key of the three switch section is depressed, by varying R201. In tuning the organ, the oscillators need to be tuned only for one of the three key switch operating possibilities. Therefore, the schematic shows that V201A is adjusted with the 1 ♯ switch depressed, V202B with the 6 ♯ switch depressed, and so on up the scale. The oscillator tone generator modules may be easily removed from the organ assembly by disconnecting the two green filament leads and red B plus lead from the rear edge of the board and the four grid input leads, the ground lead and the signal output lead from the front edge of the board. Two screws hold the board to the wooden tray.

VOICING CIRCUITS: The output from all solo manual tone generators are connected together and sent to the voicing switch located on the right hand side of the control panel above the keyboard. The voicing switch is a five-position rotary switch. The fully counterclockwise position is ganged to the AC power switch which provides the power on-off function. The voicing switch selects filtering to alter the output from the tone generators, which are rich in harmonics, so that various voices can be sent to the power amplifier circuits. The four positions of voices are FULL ORGAN, HORN, FLUTE, and STRINGS. The FULL ORGAN filter consists of a low pass filter of R40, R41, C20 and R45. This filter acts to reduce the intensity of the higher harmonics so only a few of the harmonic components are present in the output. The HORN filter

consists of a parallel resonant circuit of L1, C21 and R44. This parallel resonant circuit tends to increase the frequency response near the top end of the keyboard and drops off above these frequencies. This is similar to the resonant properties of a belled horn such as the French horn or trumpet. The characteristic nasal sound of the horn is evident in the organ output when in the horn position. The FLUTE stop is a low pass filter eliminating practically all of the higher harmonic frequencies and providing pure sine wave form. This is accomplished through R40, R41, and C21. The other components in the circuit do not materially affect this filtering. The STRING section consists of a high pass filter, where the fundamental is almost completely eliminated, and only the higher harmonics are predominant. The components used in this filter are L2 and R42.

CHORD AND BASS TONE GENERATORS: The electronic circuit for the chord and bass oscillators are identical to the solo manual tone generators. These are shown in the diagram as V101 and V102. Three of the four triode sections in this module control the three notes of the basic chord and fourth triode acts as the bass oscillator which performs one octave below the chord tone. V102A is the bass triode. Its grid passes through the automatic bass on-off switch, S2, to either the bass switches controlled by the bass keys, or the bass switch section, which is ganged to the chord buttons. Operation is identical in either switch position. It will be seen that the critical grid resistors that determine the frequency of the bass oscillator are designated from R142 through R157. The switches are such that, when a bass switch is depressed, the small shorting bar across the switch contacts is opened, and the appropriate resistor or parallel resistor combination is applied to the grid of the oscillator tube. From one to eight resistors can be connected in parallel, since there are eight notes that are controlled by the bass oscillator tube. In the solo section, only three notes are controlled. In the bass oscillator section, eight notes are controlled. The remaining three triode sections of the module control three oscillators which provide the proper chords as designated by the chord buttons. Here again resistors R125 through R141 are connected to the three grids in various combinations to provide the correct oscillator frequencies.

The chord switch consists of a printed circuit board with interconnecting wiring and timing resistors. The contacts for the switch that are connected to the P C board are gold plated contacts of the square head type. The shorting bars as designated in the schematic consists of a four-ganged section of conductive vinyl sheet laminated to foam rubber pads. This provides universal joint action for all pads, so that all eight contacts are connected properly when the chord button is released. The eight contacts referenced above are the eight contacts per chord button. Six of the eight contacts are for the three chord notes and the remaining two for the automatic bass note. The output from the bass oscillator module is applied to the power amplifier circuit through R35 and R36. R36 is the decoupling resistor and R37 provides the proper balance of level between the chord and solo section.

VIBRATO OSCILLATOR: The vibrato oscillator consists of a phase shift oscillator V1A operating at a 6 1/2 cycle per second rate. The timing resistors and condensers for this circuit are C12, C13, C14, R22, R23 and R24. The sine wave output from this oscillator is taken from the junction of R25 and R26 and provided to the ground return for a solo tone generator timing circuit. Therefore, a small 6 1/2 cycle AC voltage is applied in series with the grid resistor to the oscillator grid, thereby causing the tube characteristics to change at a 6 1/2 cycle rate and in turn changing the oscillator frequency at the same rate. This vibrato is on at all times.

POWER AMPLIFIER SECTION: The combined outputs from the chord section and the solo section are applied through decoupling resistors R35, R36, and R37 to a two-stage transistor preamplifier. This preamplifier is of the very low noise type. Transistors were chosen so that filament and hum components are completely eliminated. The output of the two-stage transistor preamplifier is controlled by the swell shoe level control, R39, and applied to the input grid of the first preamplifier tube, V2A. The output of this triode section is applied to the phase splitter of the conventional type, V2B, and from there to the grids of the push-pull output tubes and thus to the speaker. The preamplifier tubes are of the 12AX7 type and the power output tubes of the 50C5 type. Feedback is provided around the amplifier through R16 to the cathode of V2A. The speaker output impedance is 8 ohms and approximately 4 1/2 watts of continuous sine wave power may be derived from the amplifier circuit.

POWER SUPPLY: The main power supply consists of a voltage doubler circuit incorporating silicon diodes D1 and D2. This power supply is run directly from the AC line. The total voltage from the voltage doubler circuit is applied to all the tone generator circuits as well as the vibrato amplifier and preamplifier 12AX7. The voltage from just one section, about 150 volts, is applied to the two 50C5 output tubes. Capacitors C1 and C2 act as the main filter capacitors and C3 and C4 as an additional filter for the high voltage power supply. The transistor power is supplied from the 150 volt supply and filtered by a three-section RC configuration, R8, R9, R10, C5, C6 and C7.

The filaments of the 50C5 tubes are connected in series string through the 135 ohm dropping resistor, R1. All other 12.6 volt filaments are fed from the filament transformer, T2. Should any one tube in the tone generator or preamplifier section have an open filament, that tube only will be unlit. However, should one of the 50C5's open, both 50C5's will be extinguished. This is done since the 50C5 is not a critical tube as far as the tuning of the organ is concerned. It is imperative that a tube (if removed from the socket and found good) if replaced in the organ, SHOULD BE REPLACED IN THE IDENTICAL CIRCUIT FROM WHICH IT WAS REMOVED. THIS WILL PRESERVE THE TUNING FOR THAT SECTION. Due to tube and circuit characteristics, slight tuning will generally occur if a new tube is placed in the circuit.

The complete organ is fused by a 1 ampere pigtail lead fuse (F1) soldered in the power supply P.C. board. Replacement of this fuse should rarely be necessary, If it should require replacement, snap on a 1 ampere 3AG slo-blo type. No unsoldering is necessary.

The pilot light for the organ is of the neon NE2 type and should require no servicing in the field.

Warning: the power supply is of the AC-DC type and presents a shock hazard when removed from cabinet. All work and module changes should be made with the power chord disconnected.

COMPONENT REMOVAL AND REPLACEMENT: This section describes exactly how to remove and replace any component of the organ. The section following this one tells you when to replace sections.

The Component Tray: All electronics components are mounted on a tray which must be slid out of the cabinet to give access to the electronic assemblies.

Remove the (2) control knobs on the front panel by pulling gently toward you. Remove the (10) wood screws holding the backboard to the cabinet.

Remove the (2) wood screws which secure the tray to the cabinet (located on the rear corners of the tray).

Disconnect speaker and swell shoe cables from the printed circuit board of the amplifier. This is easily done by grasping the small connector firmly at the end of the wire with a long-nose pliers. Pull straight out using very little force, while holding the board down near the connector area. (DO NOT TWIST).

Pull cables down and through the hole provided. (NOTE) Observe the swell shoe color code before removal to insure proper connection for re-installation. Remember the RED is forward, WHITE center, BLACK to the rear.

Apply thumb pressure with your left hand on the front edge of the Chord-Bass section and with your right hand push the lower right hand section of the control panel. The tray will begin to slide to the rear of the cabinet. You may slide it just half way out if that will suffice to give access to what you need, or you may pull it out entirely from the rear, holding it carefully and place it on a table, floor or service bench.

Warning: screw heads may protrude beneath the bottom board of the tray. Do not place the tray on a finished surface without heavy cloth padding under the entire tray. Always avoid dragging it across the table surface even when padded.

When replacing the tray, fit it carefully into place. Notice that a groove is provided on the inside of the front face board. The tray must be fitted into this groove or it will not seat properly in the cabinet. Push the tray in until the front of the board approaches the groove. Then place your hand under the tray at the front and lift guiding it as you slide it the rest of the way. Replace rear wood screws. Replace the speaker and swell shoe cables. Secure the backboard. Install the control knobs by gentle downward pressure, making sure the line on the knob lines up with the position previously set.

CHORD-BASS SECTION REMOVAL: There are (6) wires located on the rear of the Chord/Bass section circuit board. They are easily removed by simply pulling the connectors straight out from board. DO NOT TWIST.

Remove (4) screws from underside of tray releasing the entire Chord Block Assembly. The complete section is then slid out from under the control panel through front of tray. NOTE: Do not attempt to remove circuit board from chord block unless authorized. When re-connecting the replacement unit, reverse the above procedure and re-connect each wire straight across, horizontally, without referring to any color code, as connections are quite obvious.

Tone Generators: there are several connections (9) between each generator (A) which connect to the generators on each side of it and (B) the key switch cable harness. To remove connections of a generator, grasp the small connector firmly at the end of the wire with a long-nose pliers next to the printed circuit of that generator. Pull straight out without much force while holding the board down near connector area. DO NOT TWIST. After you have removed all connections to a generator, remove the (2) wood screws which secure the module to the tray. Gently lift the entire unit and prepare for packaging by removing the tubes and inserting the module and tubes separately into the specially designed carton provided.

To insert a generator, orient it to correspond with the other generators - the quadruple potentiometer (blue knobs) toward the rear of the organ. Then insert and tighten the wood screws and re-connect the wires.

KEYBOARDS AND KEY SWITCHES: To replace a defective keyboard or to obtain access to the switches under the keys, use the following procedure:

1. Remove tray from cabinet.
2. Remove the screw holding each end of the control panel to the side pieces of the tray.
3. Raise the control panel and slide it back as far as possible, being careful not to bring it back far enough to break any of the wires attached to it.

4. Take out the (6) screws under the tray floor which hold the keyboard to the tray. Be sure to keep track of any ground wires you may come in contact with, making sure you replace them when you replace the manual.
5. Tilt the entire keyboard back so that the undersurface of the switch assembly is facing up. You are now in a position to work on keys or switching. CAUTION: place heavy protective covering over keyboard to avoid scratching keys.

PANEL CONTROLS:

Voicing Switch Assembly: Remove knob and unscrew the 3/8 nut which holds the switch to panel. Carefully unsolder shielded wire and AC connections. Take note from which lug the wires are removed so there will be no confusion during replacement. The replacement of this switch requires a factory replacement only, as this is a specially designed component.

Bass Control Switch: Remove knob and unscrew 3/8 nut which holds the switch panel. Unsolder the three wires attached. Take note of color code and switch lug for re-installation. Contacts of this switch may be cleaned with any general purpose switch cleaner. Be careful during the entire procedure of removing either of the two switches to avoid breaking any wire or lugs.

LOUDSPEAKER: to gain access to the loudspeaker and swell shoe, the backboard of the organ must be removed from the cabinet by taking out the (10) wood screws around the edges and the one under the interlock plug.

To remove the loudspeaker, disconnect the two wires from the rear of the amplifier module by unsoldering them from speaker lugs. Unscrew the nuts holding the speaker to the knee panel.

NOTE: while the speaker looks like most 12-inch speakers physically, electrically, it is not. It has been specially modified to give suitable response for the organ. It should be replaced only with the proper speaker for best results.

SWELL SHOE: the swell shoe bracket support and pedal have been designed for the life of the organ and should never need replacement. However, the potentiometer may become defective after extensive, hard use.

To remove the potentiometer, remove the backboard. Unscrew the small set screw which locks bracket to potentiometer shaft. Remove bracket.

Unsolder the (3) leads going to the lugs noting the location of the connections.

Next remove the 3/8 nut and washer which holds the potentiometer to the support bracket.

The potentiometer is now free of the bracket, and a new one can now be inserted. (This is a special control.).

TUNING: in tuning the organ, sixteen adjustments are required. All sixteen of these adjustments consist of variable resistors in the phase shift oscillator circuits. They are accessible from the back of the organ as screw driver "adjust" knobs.

The solo manual can be adjusted in several ways. The approved procedure would necessitate the use of a tuning indicator such as the Conn Strobotuner. The notes on the keyboard as designated by the numbers immediately above the keyboard are matched to the numbers over the adjustments at the rear of the organ. Therefore, the 1 ♯ adjustment is made with the 1 ♯ key pressed and C# set on the Strobotuner. Likewise the 3 is adjusted with the E note, the 5 with the G note, the 6 ♯ with the A#, the 8 ♯ with the C#, the 10 with the E, the 12 with the G, the 13 ♯ with the A#, the 15 ♯ with the C#, the 17 with the E, the 19 with the G, and the 21 ♯ with the A#.

It is possible to adjust the second and third octave of the organ without the use of the Strobotuner. To do this, the corresponding C#'s from the first and second octave are struck together, and the 8 ♯ adjusted for zero beat between the two produced tones. On either side of the zero beat, a pulsating sound will be heard, and the proper setting is at the null or zero pulsating position. Likewise the 3 and the 10, and 5 and the 12 and the 6 ♯ and 13 ♯ can be similarly adjusted. Then, with the middle octave properly tuned, the top octave can be tuned to the middle octave in the same manner, that is, the 15 ♯ can be adjusted by zero beating to the 8 ♯, the 17 to the 10, and the 19 to the 12 and finally the 21 ♯ to the 13 ♯. In addition, an experienced piano tuner can set up the middle octave by counting beats which is normally done in piano tuning and the first and third octave zero beated against this basic middle octave.

The bass oscillator is adjusted with the automatic bass switch in the off position and the G bass switch depressed. The Strobotuner is adjusted for the G note and the G control on the rear of the organ is adjusted for correct pitch.

The chord section requires three adjustments. These adjustments are made with the automatic bass switch in the off position and the C major chord button depressed. A Strobotuner will show proper adjustment of the C control, the G control, the E control when the Strobotuner is tuned to the corresponding G, C and E notes. Since there are some required beats in the chord as played, the zero beat method with the manual is not recommended. Also, when tuning the C note, the D and G outputs can be grounded for a better representation on the Strobotuner; likewise, when the G and E notes are adjusted, the other two may be grounded.

TROUBLE SHOOTING: the remaining pages of this Service Manual contain a list of typical symptoms of malfunctions (each symptom numbered and outlined). Under each symptom is printed the correct remedy. By simply running down the list to find the symptom which matches the situation, you should be able to make the repair.

Be sure that what the customer may believe is a fault is not a misunderstanding of how the organ works. A typical case of this would be the owner who calls in to say that, when he plays two notes next to each other in the same octave, only one note is heard. This, of course, is inherent in the circuit design due to the oscillator-sharing principal. One oscillator tube is used to control three adjacent notes on the keyboard.

The same lack of knowledge of the bass switch might cause the complaint that there is no bass key operation; the keys will not operate unless the bass switch is in the "Off" position. It is a good idea to get some preliminary information when the complaint is telephoned in. This may save a service call.

Do not confuse a "fault" found in mere testing with a normal situation that would not impair playability. For instance, you may find that, like all electronic devices operated from house AC power lines, there will be a small amount of hum and background noise in the speaker when the volume is raised (swell shoe depressed) and no music being played. This is of no importance, because, when the organ is played, the music will be much louder than the background noise, and the noise will not be apparent.

The Regency electronic chord organ is somewhat different from "conventional" organs. Notice the special bass section controlled by a switch, the individual voicing selection switch, and so on. All persons connected with the dealer store should deliberately make themselves familiar with how the organ operates, so that an inquiring customer can quickly and authoritatively be given answers to any questions involving operation and corrected if he believes a normal function to be a fault.

The common service problems and their remedies below are not listed in any particular order. Apparently related symptoms may relate to quite different parts of the organ.

COMMON SERVICE PROBLEMS AND THEIR REMEDIES:

1. Organ dead - no sound on solo manual or chords. Pilot lamp does not light.

(A) Check to see if line chord is connected to 105-125v 60 cycle AC power source.

(B) Check to see if tone selector switch is not in "off" position.

(C) Check fuse. Replace if necessary with clip-on type #AG one ampere slo-blo. Do not unsolder blown fuse.

(D) If trouble is none of above, and tube filaments all light, replace

(E) Check to see that oscillator tubes are lit. If all tubes on oscillator boards are not lit, but all tubes on power amplifier board are, check green leads in cable between oscillators and power boards for proper connections. If all tubes on oscillator boards are not lit and V1 (12AV6) and V2 (12AX7) on power amplifier board are also not lit, check filament transformer T2 and its leads for proper connections.

(F) If none of above is at fault, replace power amplifier board.

3. Only chord sound. Solo manual completely inoperative.

(A) Check shielded lead from tone switch to power amplifier board for proper connections.

(B) Check shielded leads from tone switch to oscillator boards (three) for proper connections.

(C) If solo manual operates in some tone switch positions but not all, check switch for poor contacts. Clean if necessary with contact cleaner.

4. Only solo manual operates. Chord and bass inoperative.

(A) If V101 (12AX7) and V102 (12AX7) on oscillator board do not light, check green leads in cable at rear of board for proper connection.

(B) If tubes V101 and V102 are lit, check red lead in same cable for proper connection.

(C) Check blue wire between power amplifier board and oscillator board next to it for proper connections.

(D) Check black wire from shield buss to oscillator board containing V101 and V102 for proper connections.

(E) If none of above are at fault, replace oscillator board containing V101 and V102.

5. Bass notes do not play in Automatic Bass Off position and chords contained only two notes instead of three.

(A) Check V101 (12AX7).

(B) Check yellow and orange wires for proper connections on oscillator board containing V101 and V102.

(C) If none of above are at fault, replace oscillator board containing V101 and V102.

6. Chords only have single note in Automatic Bass Off position. Bass notes normal.

(A) Check V102 (12AX7).

(B) Check brown and red wires for proper connections on oscillator board containing V101 and V102.

(C) If none of above are at fault, replace board containing V101 and V102.

7. One note plays persistently with no buttons or keys depressed.

(A) If tone selector switch does not affect tonal quality of persistent note, work chord buttons to clear persistent note. If trouble recurs, replace defective chord contact assembly by removing retaining spring and contact assembly while holding button down. Replace and check operation.

(B) If tone selector switch does affect tonal quality of persistent note, locate key on solo manual which controls persistent note and work up and down about twenty times to clean possibly dirty contact. If note still persists, remove and upturn solo manual as described previously in this manual under (Keyboards and Key Switches). Use switch adjusting tool from your service kit to adjust fingers in the right direction by bending slightly. Be very careful not to bend switch contact any further than necessary. Bend silver wire only at its root. A persistent note may also be caused by a broken wire at rear of key switches or at front of generator. Examine visually and if necessary check with ohmmeter to detect wire broken within insulation.

8. Inoperative solo notes.

(A) Refer to chart below for tube affecting notes indicated.

If notes 1, 1 ♯ and 2 do not play, check V201 (12AX7).
If notes 2 ♯, 3 and 4 do not play, check V201 " .
If notes 4 ♯, 5 and 5 ♯ do not play, check V202 " .
If notes 6, 6 ♯ and 7 do not play, check V202 " .
If notes 8, 8 ♯ and 9 do not play, check V301 " .
If notes 9 ♯, 10 and 11 do not play, check V301 " .
If notes 11 ♯, 12 and 12 ♯ do not play, check V302 (12AX7).
If notes 13, 13 ♯ and 14 do not play, check V302 " .
If notes 15, 15 ♯ and 16 do not play, check V401 " .
If notes 16 ♯ 17 and 18 do not play, check V401 " .
If notes 18 ♯, 19 and 19 ♯ do not play, check V402 " .
If notes 20, 20 ♯, 21 and 22 do not play, check V402 " .

(B) If all notes from 1 to 7 do not play, check all wires to oscillator board containing V201 and V202 for proper connections. If tubes and cables are OK, replace board.

(C) If all notes from 8 to 14 do not play, check all wires to oscillator board containing V301 and V302 for proper connections. If tubes and cables are OK, replace board.

(D) If all notes from 15 to 22 do not play, check all wires to oscillator board containing V401 and V402 for proper connections. If tubes and cables are OK, replace board.

(E) If only one solo note fails to play, check key switch under defective key for proper opening when key is depressed. Adjust if necessary, as described above in paragraph 7 (B).

9. Intermittent note (or scratch attack of note).

(A) Work intermittent key twenty times or more. Wiping action will usually clean a dirty contact.

10. Noisy operation of swell shoe volume control.

(A) Replace with appropriate potentiometer (obtainable only from factory).

11. Sticking keys.

(A) Sticking keys may be caused by control panel resting on keys. Control panel should be 1/32 to 1/16 inch above the keys.

To correct:
Remove tray and adjust to proper height. Control panel can sometimes be adjusted in console by placing thumbs against the panel and pushing upward.

(B) Sticking keys may be caused by improper spacing between adjacent keys.

To correct:
Remove tray from organ console. Locate up-stop/down-stop tab under incorrectly spaced key. This tab is a vertical metal tab about 1/8 inch wide going up into key channel and can be seen by looking up under the keys from the front.

(C) With long-nosed pliers, twist tab to left or right to correct spacing of key.

PARTS REPLACEMENT: Replacement parts should be ordered from Electro-Voice, Incorporated, Organ Service Department, Buchanan, Michigan. When ordering please state the following:

1. The part number
2. The part description
3. The organ serial number
4. The owner's name

NOTE: When replacing component parts, such as resistors and capacitors, take note of their tolerance values. Replace with exact values to insure circuit efficiency.

TUBE VOLTAGES

NO.	TYPE	PIN 1	2	3	4	5	6	7	8	9
V1	12AV6	-1.5	0.9	6AC	6AC	--	--	175	--	--
V2	12AX7	95	0	0.75	6AC	6AC	238	34	37	0
V3	50C5	169	158	100AC*	50AC*	169	300	290	--	--
V4	50C5	169	158	0AC*	50AC*	169	300	290	--	--
V101	12AX7	215	0.1	2.7	6AC	6AC	215	0.1	2.7	0
V102	12AX7	215	0.1	2.7	6AC	6AC	215	0.1	2.7	0
V201	12AX7	242	0.1	2.8	6AC	6AC	215	0.1	2.7	0
V202	12AX7	205	0.1	2.8	6AC	6AC	215	0.1	2.7	0
V301	12AX7	215	0.1	2.7	6AC	6AC	215	0.1	2.7	0
V302	12AX7	215	0.1	2.7	6AC	6AC	225	0.1	3.0	0
V401	12AX7	215	0.1	2.7	6AC	6AC	215	0.1	2.7	0
V402	12AX7	215	0.1	2.7	6AC	6AC	215	0.1	2.7	0

*Notes:

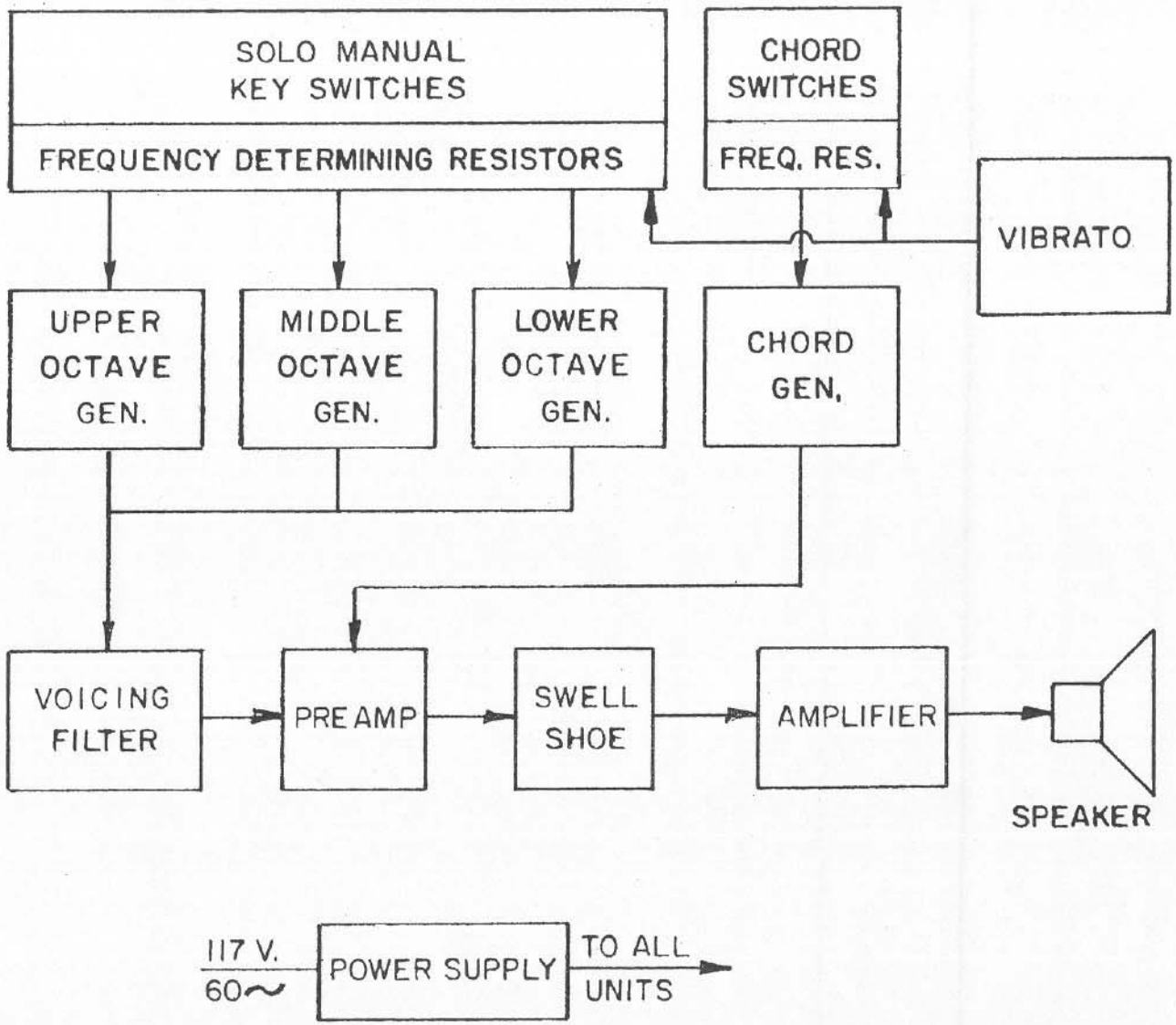
1. 50C5 filaments have DC voltage superimposed. Use AC meter which blocks DC component or measure with AC - VTVM and 0.1 MFD, 600 V condenser in series with meter lead.
2. Measurements taken in reference to ground braid using VTVM.
3. NC - No Connection.
4. All volts DC unless noted.
5. + or - 15% of indicated measurement is normal.
6. Line == 117V AC

PARTS LIST

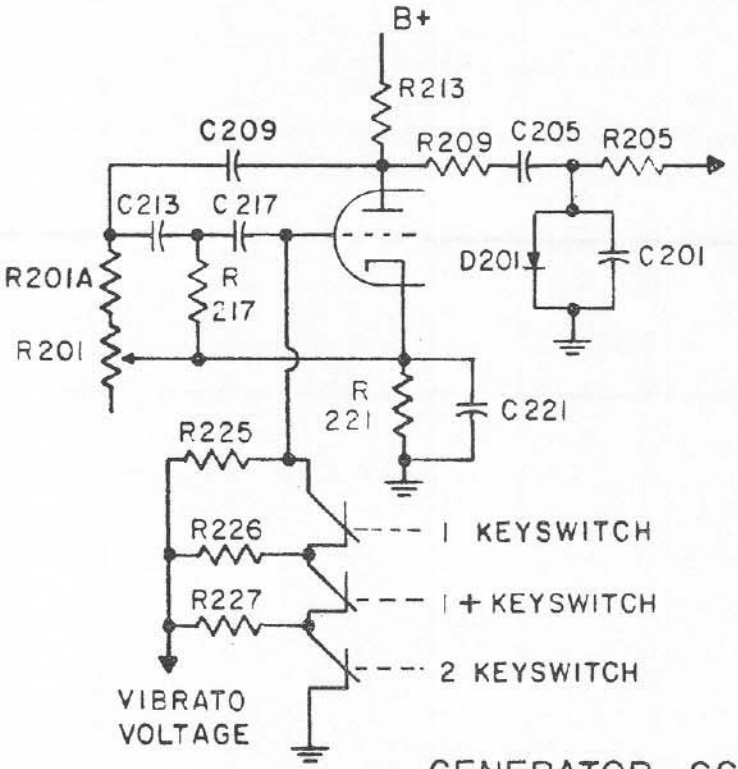
Subassembly Name	Part Numbers	Retail Price	Dealer Cost
Complete organ tray	A82820	$250.00	$175.00
Voicing switch	42884	5.95	3.95
Chord switch assembly	A82866	35.00	18.90
Knob	20650	.45	.30
Bass switch	56047	.75	.44
Key switch actuator	75480	.10	.05
Top octave switch	82851	7.50	4.00
Middle octave switch	82852	7.50	4.00
Low octave switch	82853	7.50	4.00
Power amplifier printed circuit with tubes	A82868	54.00	27.50
Chord oscillator with tubes	A82869	26.00	15.00
Low octave oscillator with tubes	A82870	27.50	16.50
Middle octave oscillator with tubes	A82871	27.50	16.50
High octave oscillator with tubes	A82872	27.50	16.50
12AX7 tube	4311	2.95	1.45
50C5 tube	43019	3.30	1.65
37 note keyboard	74998	37.50	22.00
Black chord buttons only	75023	.25	.10
White chord buttons only	75020	.25	.10
Chord contact switch assembly	82888	47.50	25.00
Spring retainer wire	19010	.10	.05
Spring chord button return	19032-BX	.10	.05
Swell Pedal Assembly			
Control bracket	75944	.50	.25
Pedal assembly	83293	.50	.25
Lever assembly	83261	1.20	.60
Felt washer	38231	.10	.05
Friction arm	75386-AD	.30	.15
Hinge	20687-BX	1.50	.75
Miscellaneous Parts			
Speaker	75960	15.00	8.95
Swell shoe potentiometer	46301	4.95	3.50
Transformer-filament	82919	4.95	3.50

BUTTERFLY .90

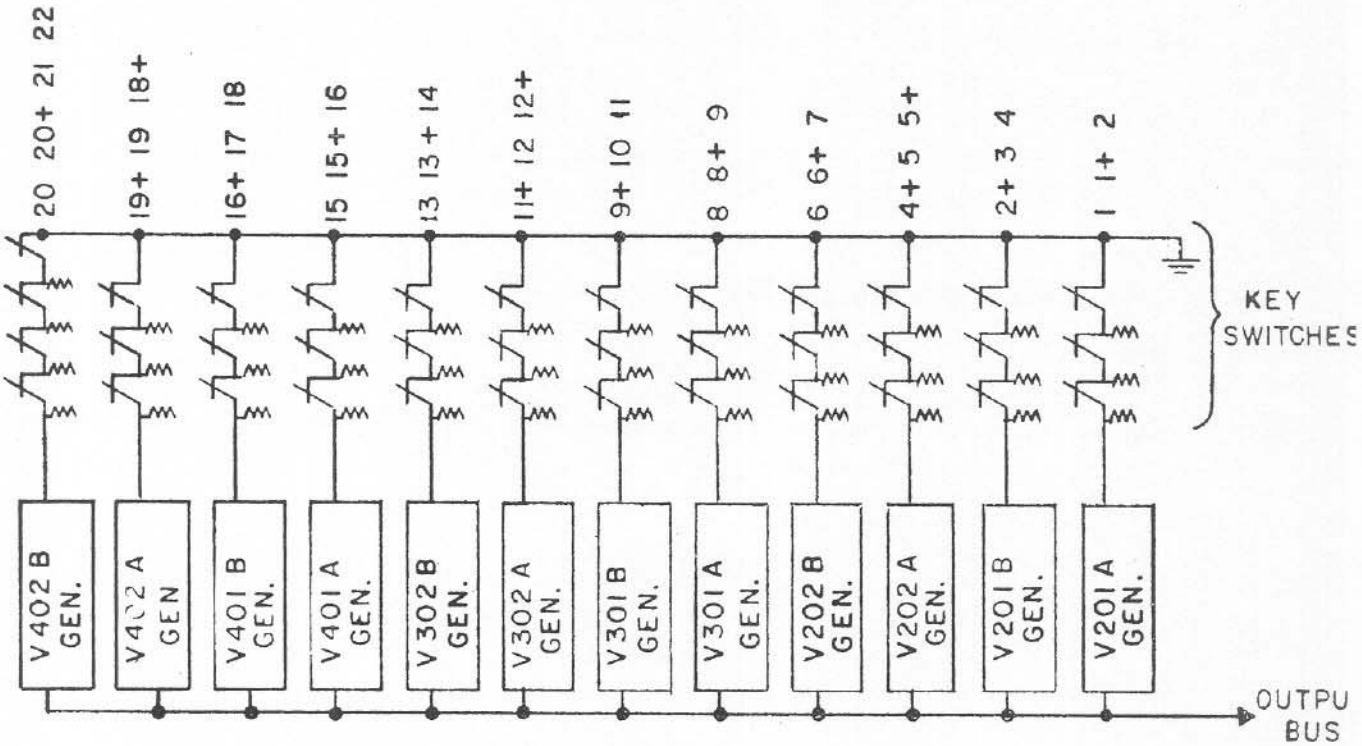
PADS .15



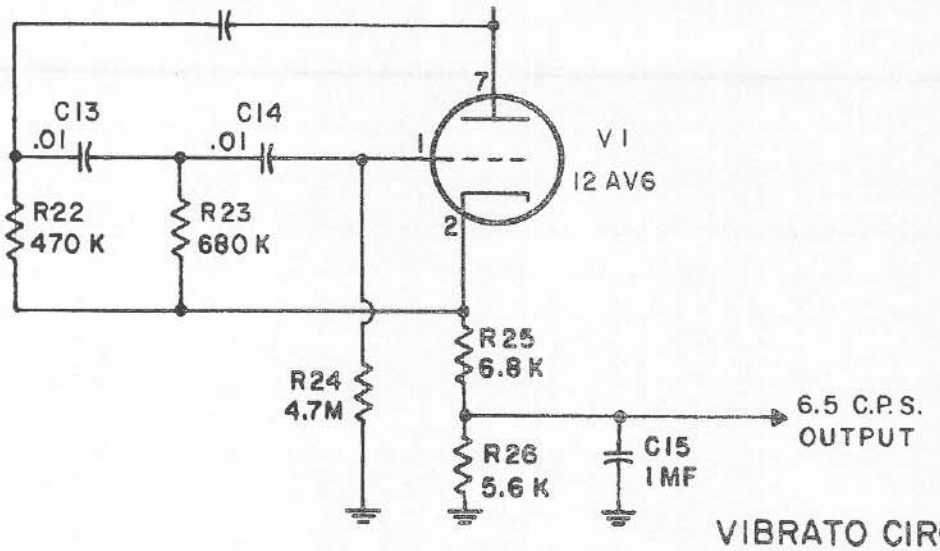
MODEL 6205
BLOCK DIAGRAM



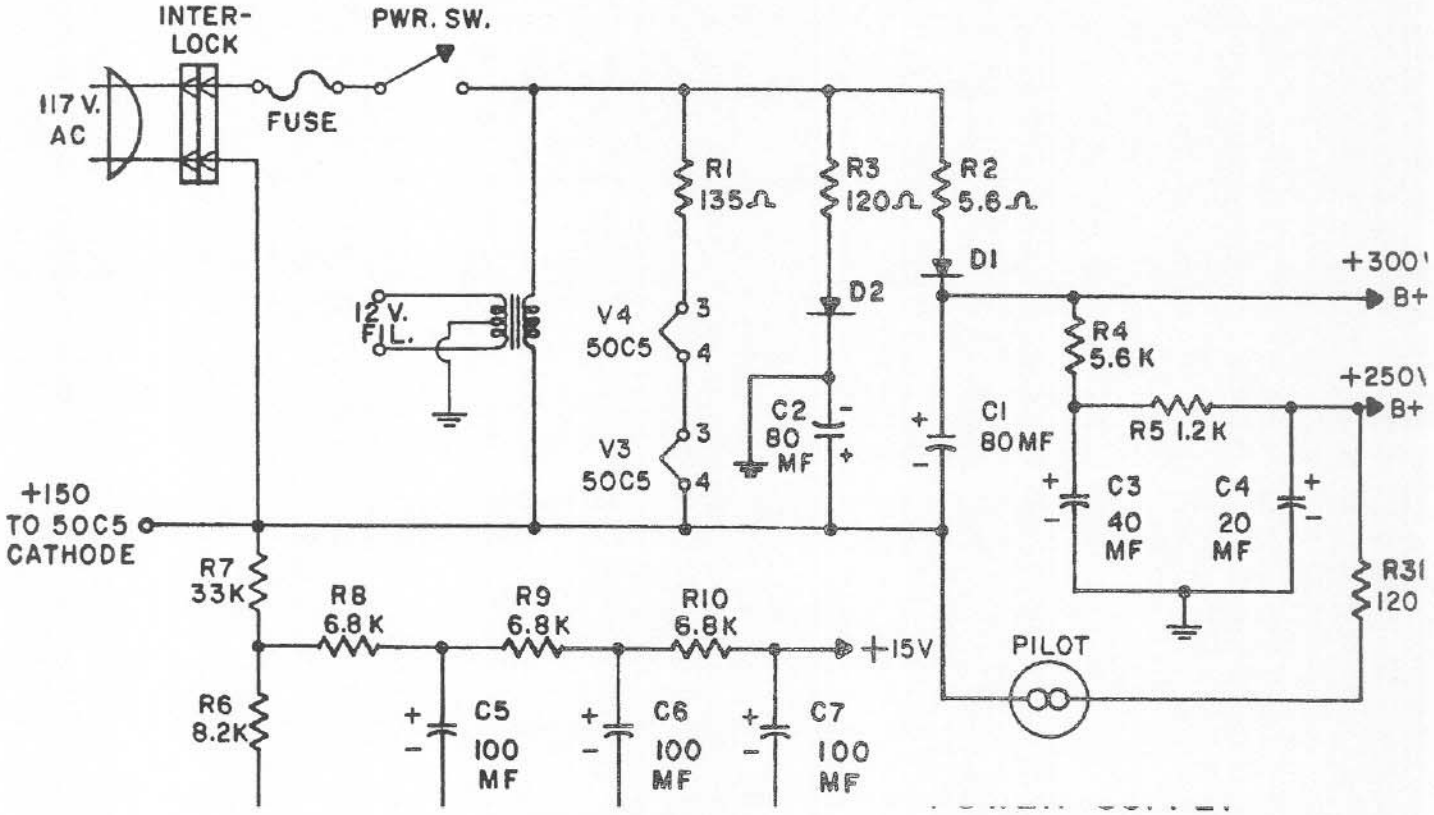
GENERATOR SCHEMATIC

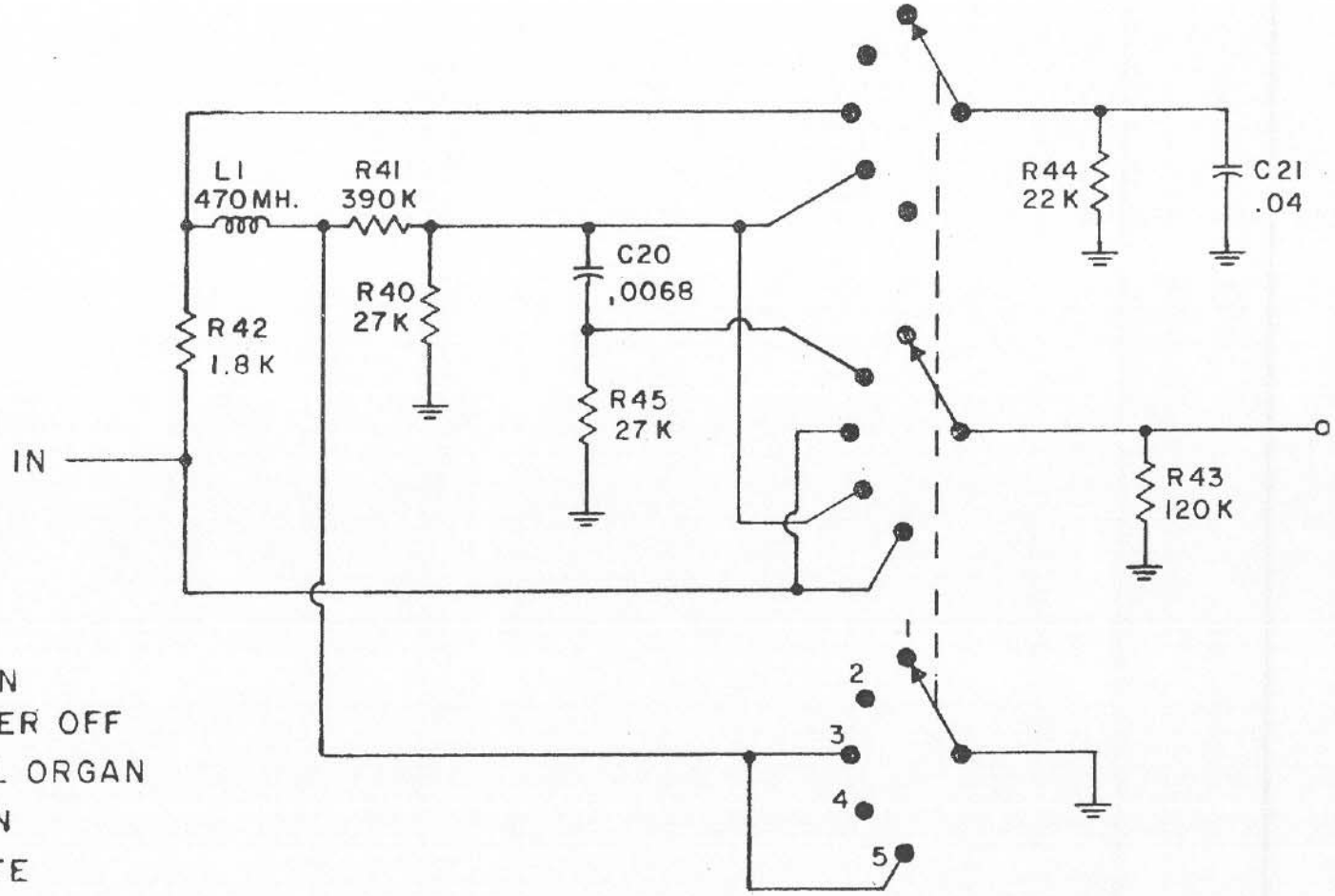


GENERATOR & KEYSWITCHES
BLOCK DIAGRAM



VIBRATO CIRCUIT

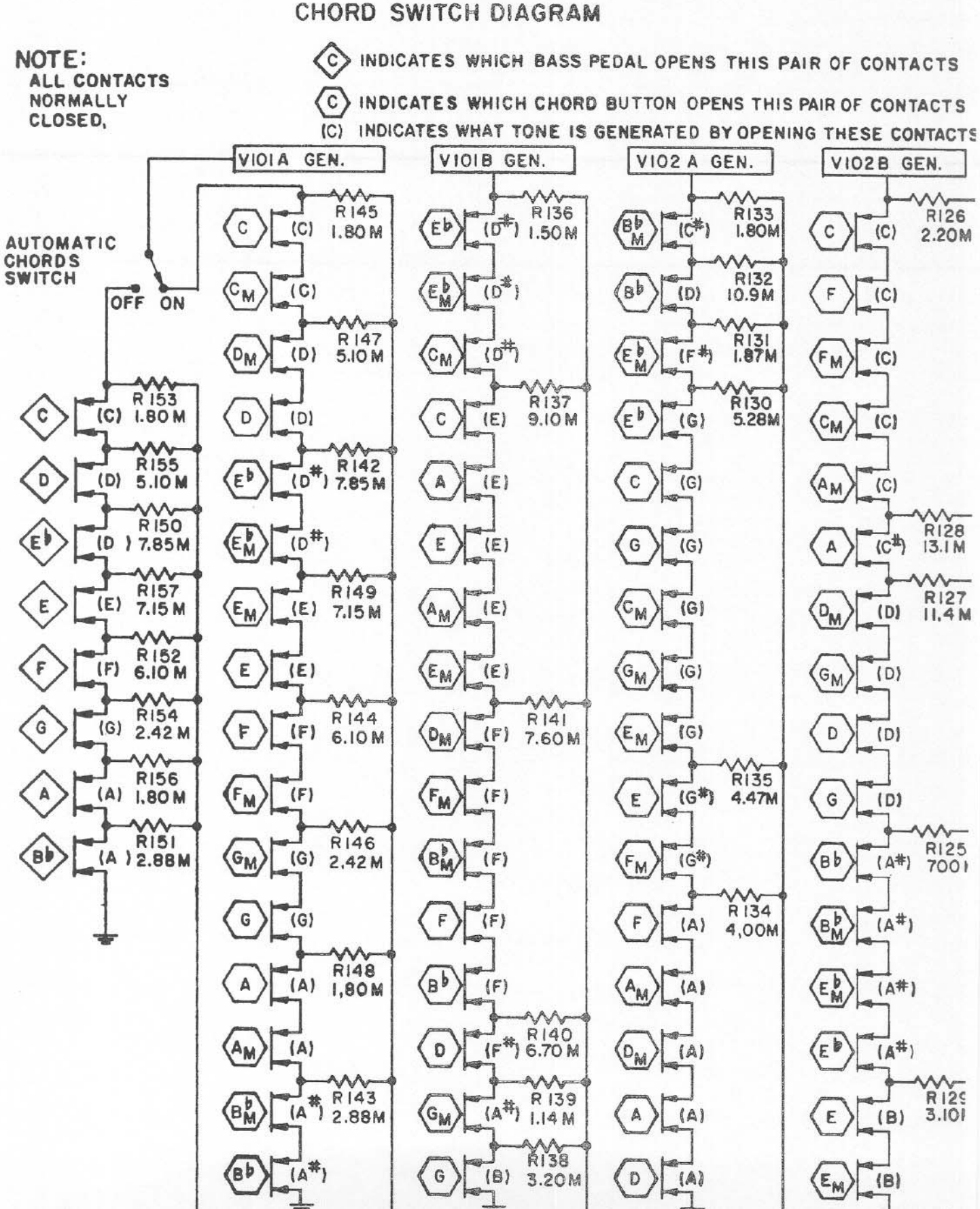




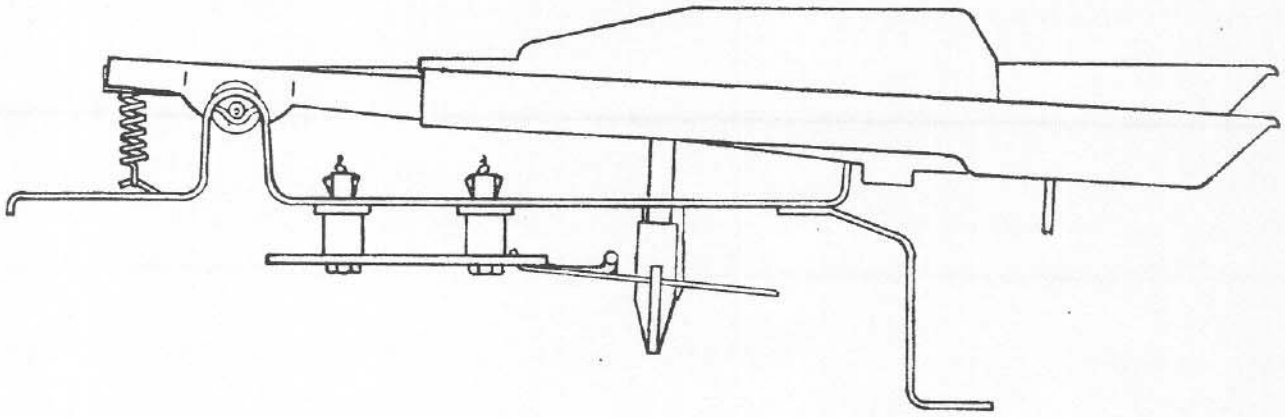
POSITION
1. POWER OFF
2. FULL ORGAN
3. HORN
4. FLUTE
5. STRING

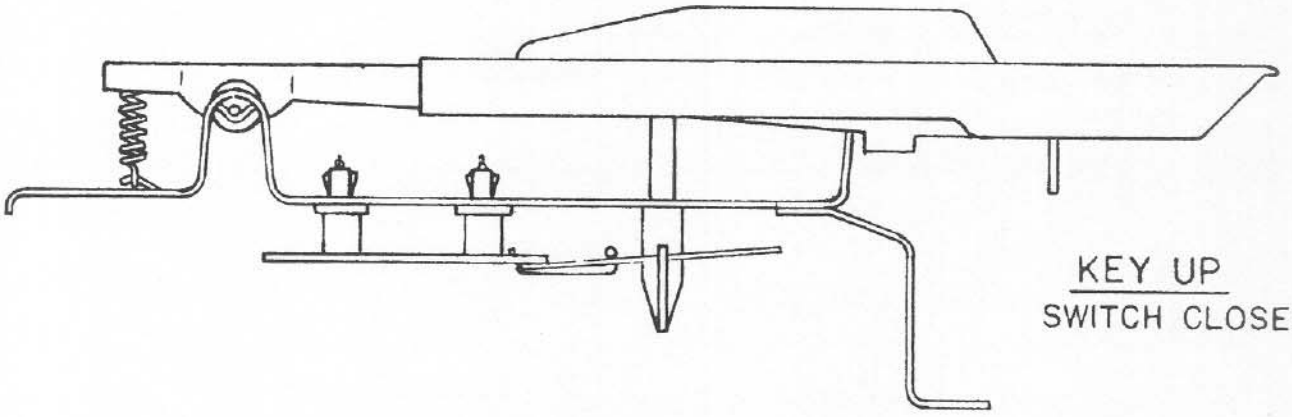
TONE FILTERING CIRCUIT

CHORD SWITCH DIAGRAM



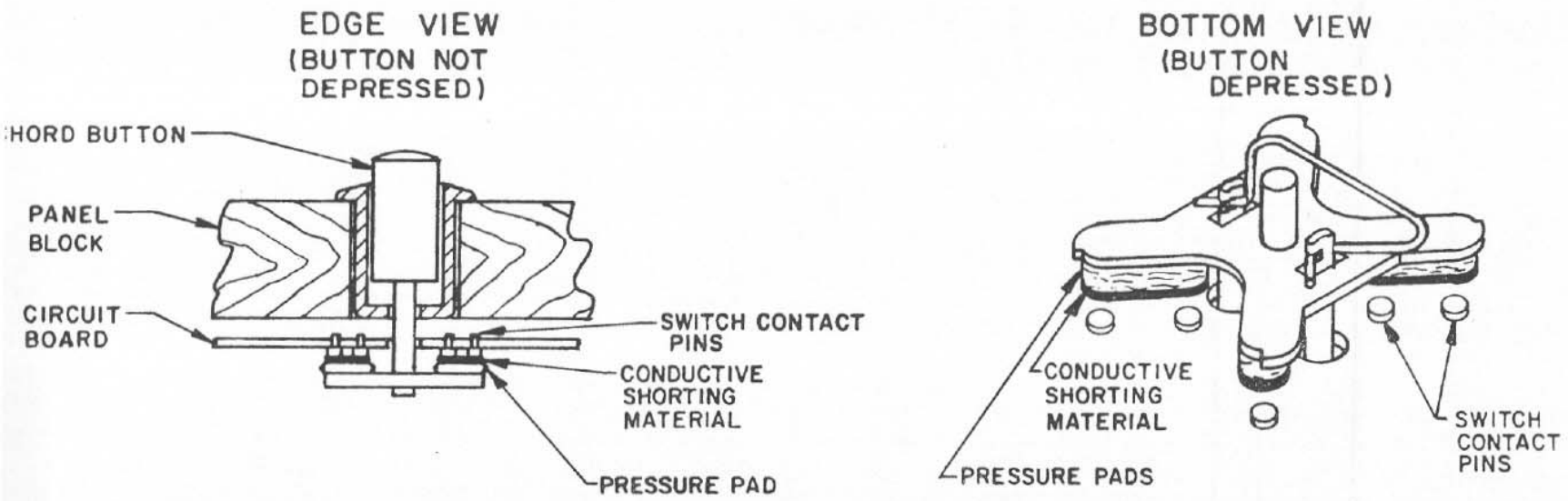
KEY DEPRESSED
SWITCH OPEN



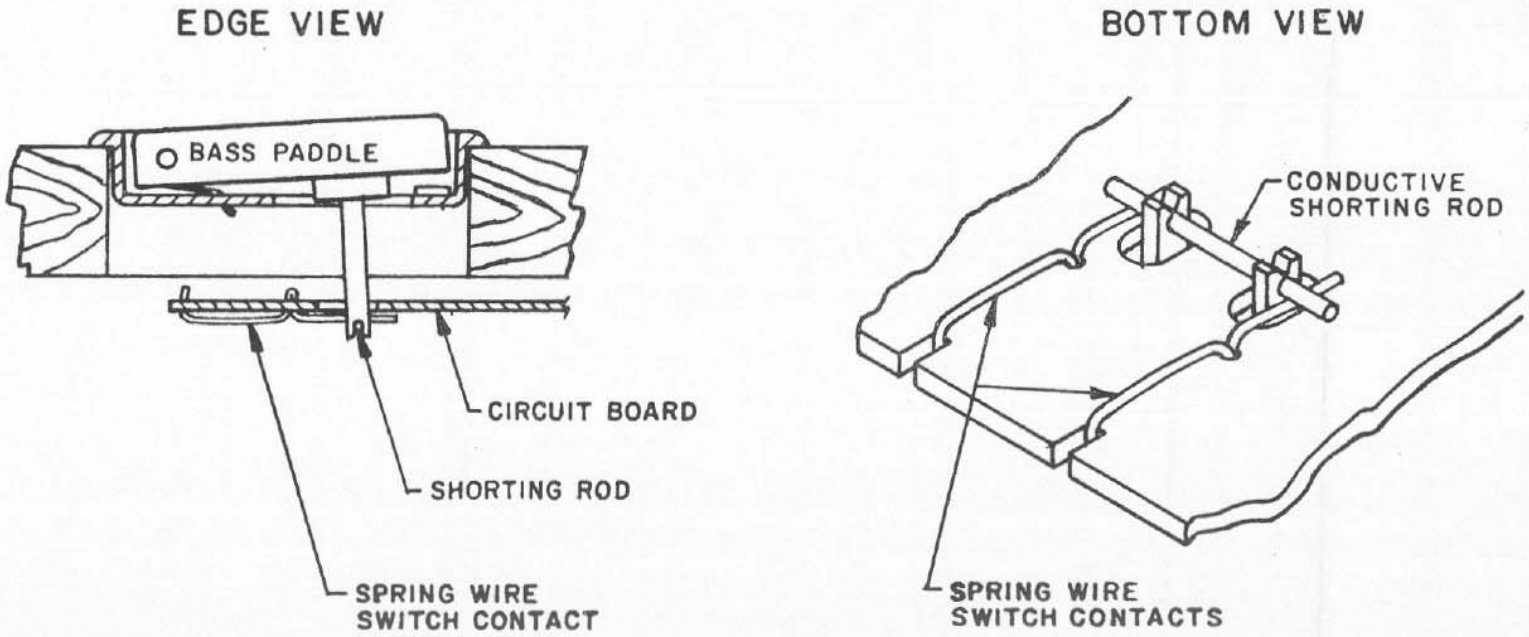


KEY UP
SWITCH CLOSED

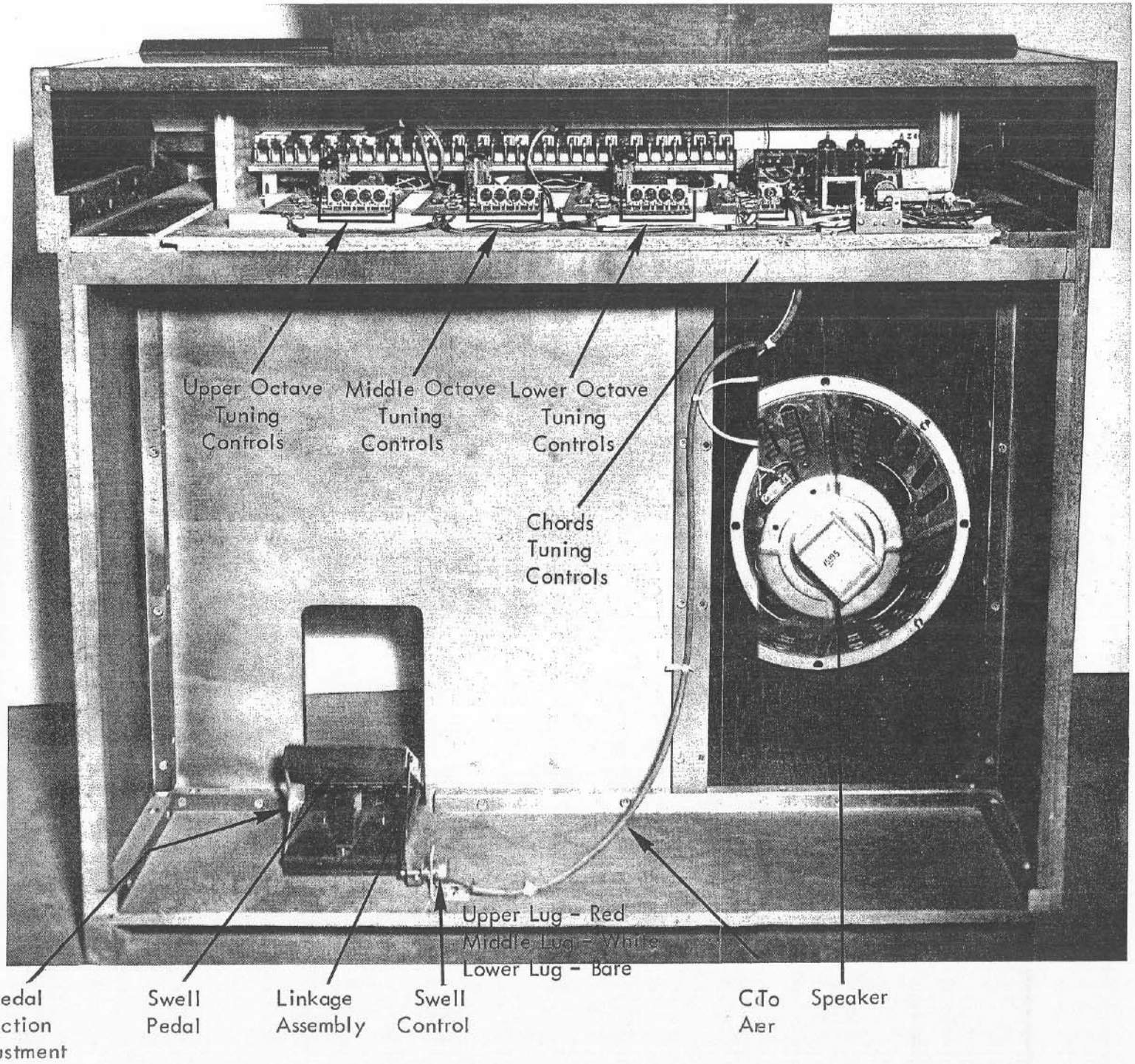
KEYSWITCHES ON SOLO MANUAL



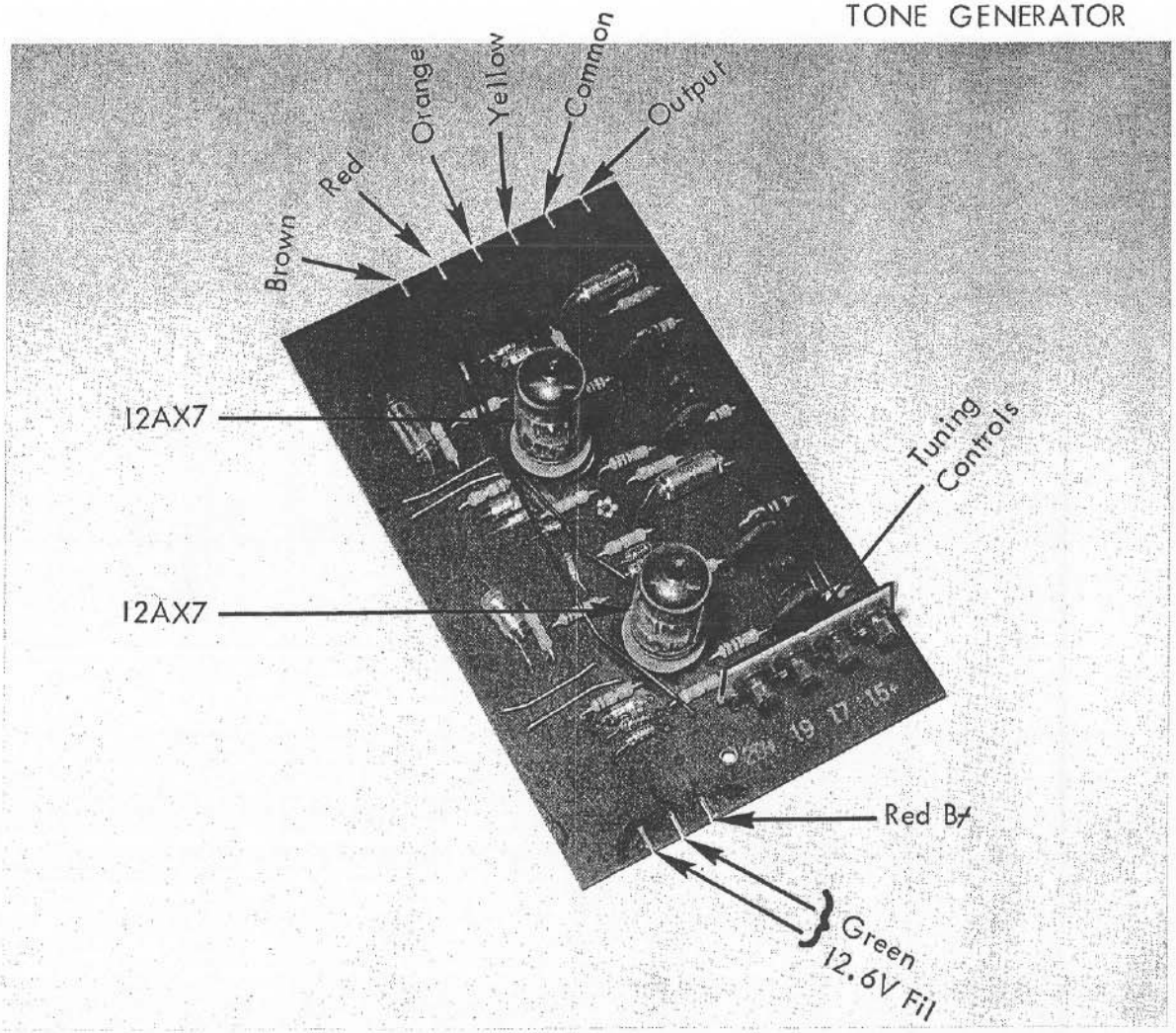
6205 CHORD SWITCHES



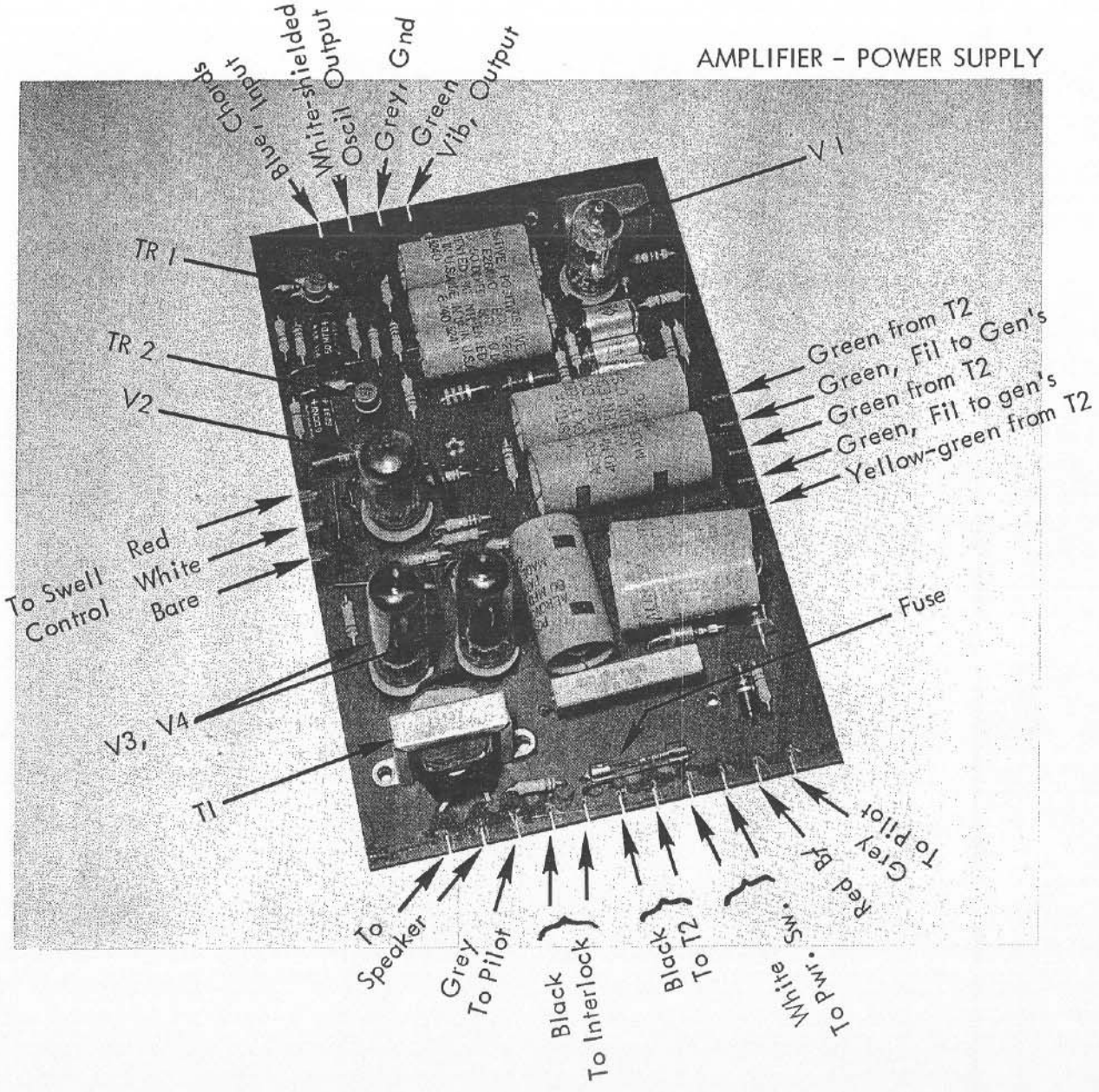
6205 BASS SWITCHES


Upper Octave Tuning Controls
Middle Octave Tuning Controls
Lower Octave Tuning Controls
Chords Tuning Controls
Upper Lug - Red
Middle Lug - White
Lower Lug - Bare
Pedal Friction Adjustment
Swell Pedal
Linkage Assembly
Swell Control
To Amp
Speaker

TONE GENERATOR



AMPLIFIER – POWER SUPPLY



TRAY ASSEMBLY