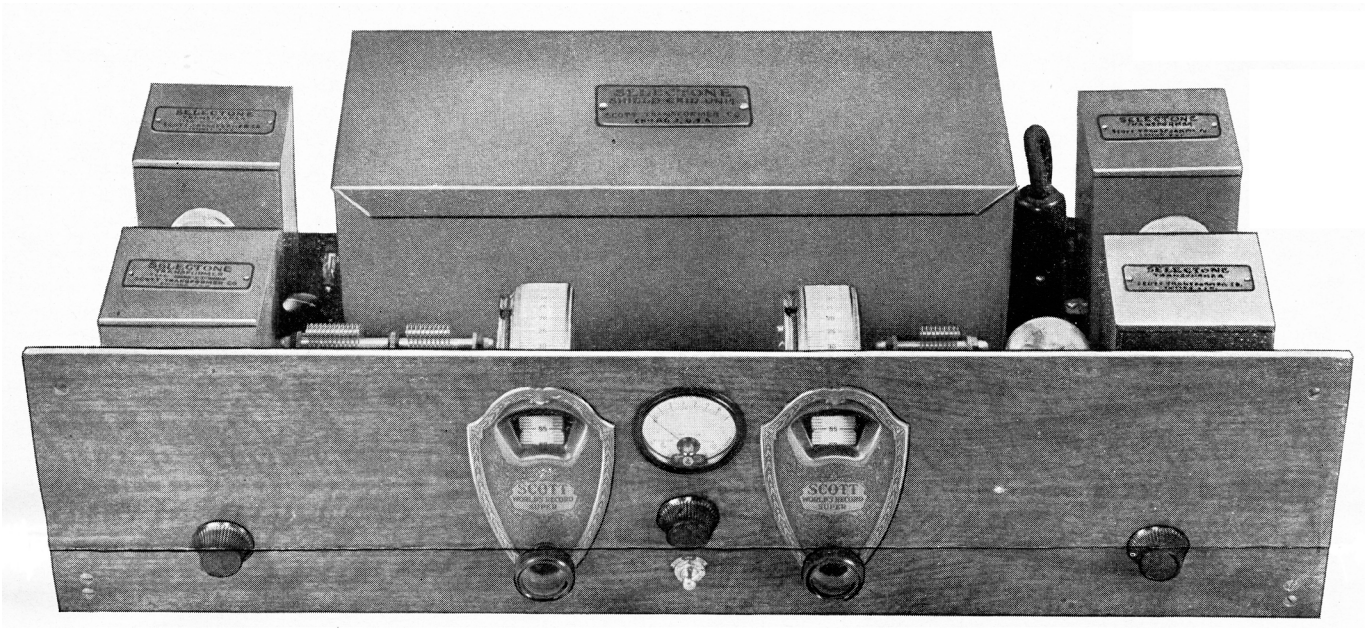
INSTRUCTION MANUAL



HOW TO CONSTRUCT, INSTALL AND OPERATE

Scott's World's Record Shield Grid Nine

and

Power Amplifier

C O N S T R U C T I O N, W I R I N G A N D O P E R A T I O N

OF THE

S C O T T W O R L D ' S R E C O R D S H I E L D G R I D N I N E

An examination of the graphic diagram showing the bottom of the base panel will reveal how simple and easy the wiring and assembly is. With the exception of the wires running up to the variable condensers, voltmeter and dial-lights, no wiring shows above the top of the base-panel.

STARTING ASSEMBLY

ASSEMBLY OF PARTS ON FRONT PANEL:

The parts that go on the panel are the two drum dials, voltmeter, two rheostats, .000135 MMF midget condenser, the largest midget and the filament switch. There is little trick in getting the switch arm through the hole in the panel, but it can be inserted easily if the switch arm is first turned midway between the off and on position. The switch is mounted below the .000135 condenser. The position of each of these parts is clearly shown in the graphic diagram.

Attach top and bottom brackets to base-panel, then fasten front panel to brackets.

ATTACHING THE VARIABLE CONDENSERS:

There are two condenser shafts provided. The steel shaft is used with the two-gang condenser while the bakelite shaft is used with the single condenser.

ATTACHING BRACKET TO CONDENSERS:

First fasten the brass bracket to the ends of condensers. On the two-gang condenser, fasten it to the end with .0005 section, while on the single condenser, fasten it to the end with trimmer plate. To attach the bracket, you simply unscrew the hex nut on end of bearing, fit bracket on end, then screw the nut on again firmly.

ATTACHING TWO-GANG CONDENSER:

With the bracket attached, slide the steel shaft through the center of the two-gang and into the drum dial. Now, line up the holes in the bottom of the bracket so that they fit holes in base-panel. Put lug under one of the screws holding bracket to base-panel (as shown in diagram) before tightening screws. Next see that plates on both sections of condenser are fully meshed, then tighten set screws on condenser rotor that holds shaft in position. Now rotate drum dial until it shows 100, then tighten set screws on dial.

ATTACHING THE SINGLE CONDENSER:

First slide the bakelite shaft through center condenser and into drum dial. This is long enough to go right through dial. Line up holes in bracket with those in base-panel and after placing lug under one of the screws, tighten down. Next, tighten screws in condenser rotor and after seeing that plates

are fully in mesh, rotate drum dial until it shows 100, then tighten set screws at both ends of dial.

ATTACHING INTERMEDIATE AMPLIFIER TO BASE PANEL:

You will notice three holes in base panel corresponding to the three holes in the bottom of the intermediate amplifier. The wires coming out of the amplifier should be brought through the holes in the base-panel, then the amplifier fastened to base-panel with the nuts, The diagram shows lugs placed under two of the nuts holding the amplifier to the base-panel and these should be put on before tightening nuts.

ATTACHING BINDING POSTS, GRID CONDENSER, AND CABLE BASE TO BASE-PANEL:

The graphic diagram shows clearly the position of each binding post and the grid condenser. Place lugs under each screw holding binding pasts and under nut on both screws holding grid condenser to base. The base for cable should be attached so that the groove for pin faces the back.

ATTACHING TYPE 640 AUDIO TRANSFORMER:

Place this so that the name plate reads properly when looked at from front of set. Place lug under nut on screw terminals P.B.G.F. and under lug 2-A before tightening down. Be careful not to pull down nuts too tightly to avoid possibility of breaking bakelite plates.

ATTACHING THE .000055 MIDGET CONDENSER TO BASE-PANEL:

Attach the bracket to condenser, then fasten to base-panel in position shown in diagram. This completes the mounting of all parts on both panel and sub-panel, and you can now proceed with the wiring.

SOLDERING

No radio receiver can operate satisfactorily unless every connection is properly soldered. Just one poorly soldered connection will ruin the operation of and the results obtained from any receiver. If connections are not soldered properly, the slightest vibration will loosen them, and cause noises in set that sound like static. It is absolutely necessary therefore, that particular care be taken to see that every soldered connection is perfect.

It is impossible to make a perfect soldering job unless you have a good soldering iron. A cheap soldering iron does not usually give enough heat to make a perfect joint. A good iron will cost you a little more, but it is well worth its price. We have tried out many makes of soldering irons and have found the "American Beauty" the best and one that will last indefinitely.

HOW TO SOLDER:

Use nothing but rosin core solder, never use acid. A very small amount of soldering paste may be smeared on end of wires and connections. However, always be *sure* to immediately wipe each connection with a piece of cloth to remove every trace of the paste as soon as joint is soldered as any trace of it left will cause trouble later on.

To make a perfect soldering joint, place tip of soldering iron on connection or joint for about two seconds to heat it up, then touch end of iron with solder. Allow just enough to make a good joint or connection.

If you use a poor soldering iron it very often does not heat up joint enough to thoroughly sweat solder into it with the result you have what is known as a cold solder joint that may look all right, but it is really a high resistance joint. Your set may operate after a fashion but will not operate at full efficiency. If you are sure that every solder joint is perfect, you can rest assured that when you connect up your SCOTT WORLD'S RECORD SHIELD GRID NINE, it will give you every satisfaction.

WIRE USED:

With the kit, you are supplied with sufficient black flexible wire to completely wire the receiver. All leads coming out of amplifier are different colors and the graphic diagram shows clearly where they are connected. After wire has been cut to correct length, the insulation can be pushed back and end of wire soldered to lug or contact.

WIRING THE INTERMEDIATE AMPLIFIER:

The intermediate amplifier comes to you completely wired with flexible colored leads coming from it long enough to make the necessary connections. Simply push insulation back from end of wire and solder.

1) SOLDER the RED, BLUE, BLACK and YELLOW wires to the cable base contacts as shown in the diagram.
2) SOLDER the GREEN wire to lug on side of 15 ohm rheostat shown in diagram.
3) SOLDER SLATE wire to lug on negative post on voltmeter.
4) SOLDER WHITE wire to lug on P terminal of #640 transformer.
5) SOLDER WHITE wire coming out of other end of amplifier to socket contact of #T-1 of #620 transformer.
6) SOLDER RED wire to lug #8-A.

****THIS COMPLETES THE WIRING OF INTERMEDIATE AMPLIFIER.****

WIRING OF RECEIVER

Solder one end of 2 ohm resistor to F- on socket of first audio tube.

All wires excepting those coming out of the shield grid amplifier are numbered and it will be found easier if they are connected in the order in which they are numbered.

WIRE #1:- connects to end of resistor and to end of lug #1-A.

WIRE #2:- connects one side of the filament switch to lug #1-A.

WIRE #3:- connects to end of lug #1-A and to side of 15 ohm rheostat shown in diagram.

WIRE #4:- connects to lug #2-A. then to F- on first audio tube socket and to F- on oscillator tube socket.

WIRE #5:- connects to F- contacts on first audio tube socket and to F- contact on #610 oscillator contact.

WIRE #6:- connects F+ contact on first audio tube socket to F+ contact on oscillator tube socket.

WIRE #7:- connects to one side of dial-light to F+ on oscillator socket and to RED terminal on cable socket.

WIRE #8:- connects F+ on oscillator tube socket to + terminal on voltmeter.

WIRE #9:- connects one side of dial-light on to side of 15 ohm rheostat connected to wire #3.

WIRE #10:- connects P contact on #610 oscillator to P on oscillator tube socket and to lug #3-A which connects to rotor on .00035 condenser.

WIRE #11:- connects contact on G of #610 oscillator to G on oscillator tube socket through hole in baseboard to lug on stator of .00305 condenser.

WIRE #12:- connects to F+ of first audio tube socket to F+ of R.F. tube socket.

WIRE #13:- connects G on first audio tube socket to lug on G of #640 audio transformer.

WIRE #14:- connects F of #640 audio transformer to BROWN contact on cable base.

WIRE #15:- connects lug on B binding post to YELLOW terminal on cable base.

WIRE #16:- connects lug on plate binding post to P contact on first audio tube socket.

WIRE #17:- connects BLUE terminal on cable base to B contact on #610 oscillator.

WIRE #18:- connects B on #640 audio transformer to SLATE terminal of cable base.

WIRE #19:- connects SLATE terminal on cable base to B on #620 R.F. transformer.

WIRE #20:- connects GREEN on base contact to the other side of filament switch.

WIRE #21:- connects #2 contact on #610 oscillator to G contact on #620 R. F. transformer.

WIRE #22:- connects contact on G of #620 R.F. transformer thru hole in baseboard to stator of .0004 section of two-gang condenser.

WIRE #23:- connects to G contact on #620 R.F. transformer to stator plates of .000135 condenser.

WIRE #24:- connects contact #1 of #610 oscillator to lug #4-A under screw holding .00025 grid condenser to base.

WIRE #25:- connects side of 25 ohm rheostat shown in diagram to lug #5-A holding can of intermediate amplifier to base.

WIRE #26:- connects lug on short wave antennae binding post to P on R.F. tube socket.

WIRE #27:- connects lug on ANTENNAE binding post to P of #630 antennae coupler.

WIRE #28:- connects lug on GROUND binding post to both F and B contacts on #630 antennae coupler.

WIRE #29:- connects B contact on #630 antennae coupler to F- on R.F. tube socket, and to lug on #6-A under nut connected to rotor on regenerative condenser.

WIRE #30:- connects F- of R.F. tube socket to F on #620 transformer and to lug #7-A under rotor of two-gang condenser.

WIRE #31:- connects lug #7-A to lug of rotor plates of .000135 condenser.

WIRE #32:- connects P on #620 R.F. transformer to P on R.F. tube socket.

WIRE #33:- connects contact T-2 on #620 R.F. transformer thru hole to lug on stator of regenerative condenser.

WIRE #34:- connects G contacts on #630 antennae coupler and R.F. tube socket thru hole in baseboard to lug on stator of .0005 condenser.

WIRE #35:- connects side of 25 ohm rheostat shown in diagram to lug #7-A.

WIRE #36:- connects side of switch which wire #2 connects to dial-light.

WIRE #37:- not drawn in graphic diagram. Connects other side of dial-light to F+ on voltmeter.

****THIS COMPLETES THE WIRING OF THE RECEIVER.****

NOTE:-The rotor plates of a condenser are those that move or rotate when knobs are turned. The Stator Plates are those that do not move.

CHECK OVER WIRING CAREFULLY:

After completing the wiring re-check it all very carefully. Be sure that wire going to its correct position. Examine every soldered joint to see that solder is well flowed in. Go over all nuts to see that they are tight.

HOW TO DO CABLE WIRING:

If leads have been run as shown in the graphic diagram, you find that both filament and B current leads can be brought together in the form of a cable. Do not run plate or grid leads in cable. The photograph below shows how the bottom of the base-panel looks when this is done. Secure a fairly long length of waxed thread from any shoe repair store, then loop this string about every quarter inch ($\frac{1}{4}$") around each group of wires. Cabling, in addition to improving the appearance of the wiring job, also has a certain amount of effect in increasing the efficiency of the receiver.

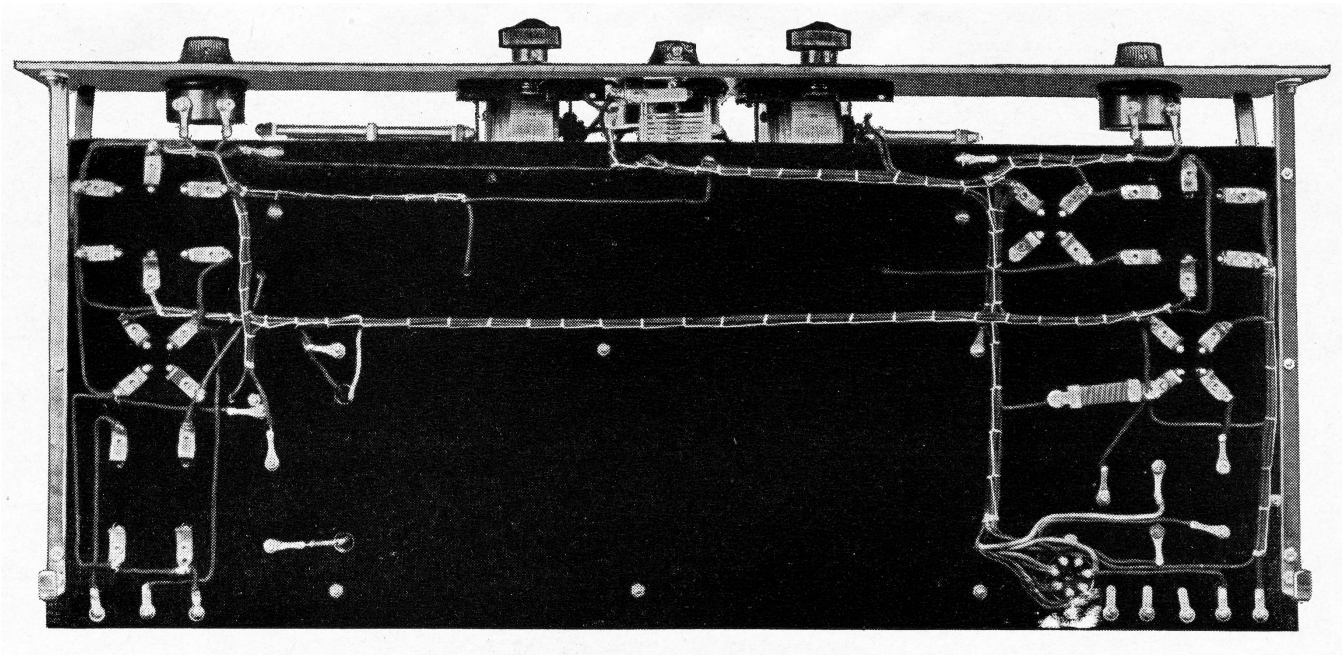


Figure 1. Underside of base-panel showing cabling

TUBES USED:

In the schematic wiring diagram we have indicated the type of tubes to be used in each socket. Any of the standard makes of tubes will be found perfectly satisfactory.

FIRST TEST:

Now the wiring has been completed and carefully re-checked, insert the tubes, then connect up the A battery to cable and turn on switch. If the wiring is O.K. each of the tubes will light. Now turn the 25 ohm rheostat up and down noting the filament of the R.F. tube. It should get bright or dim as the rheostat is turned. Now, observe the voltmeter while turning the 15 ohm rheostat up and down. The voltmeter should show a variation in voltage as the rheostat is turned.

If the above test is O.K., then, after connecting up speaker tips, connect either B batteries or B eliminator and switch on, and by rotating the dials you should be able to tune in a station.

In the SCOTT WORLD'S RECORD SHIELD GRID NINE you will find that the receiver can be made to oscillate readily, but it will also be found that this oscillating condition is under perfect control. When you tune in a station, if you find that the receiver squeals, reduce the voltage in the R.F. tube by turning the 25 ohm rheostat back until the squeal just stops, or reduce the voltage on the screen grid amplifier by means of the 15 ohm rheostat. Operate your set for maximum efficiency by keeping the tubes just below the point where they bring stations in with a squeal.

SHIELD GRID AND 2nd DETECTOR TUBE WEIGHTS:

You will notice a clip on top of three of the weights. This is to clip flexible brass tubes coming from the shield grid transformers to weight. The weight for 2nd detector is simply placed over the top of tube.

OPERATING INSTRUCTIONS

The knob in the center which controls the .000135 condenser should be turned so that the plates are entirely out of mesh on stations between 200 and 280 meters, then, from there on to 546 meters, it is gradually turned into mesh as you go into the higher wave lengths

The 25 ohm rheostat on the left hand side of panel is used as a sensitivity, volume and oscillation control on the R. F. tube, It should be turned up on the higher wave lengths, but on the lower wave lengths it should be turned back to the point where the R.F. tube does not oscillate.

The 15 ohm rheostat at the right controls the filaments of the shield grid tubes, while the voltmeter shows the exact voltage you are operating them at. This rheostat can also be used as a volume control. The shield grid tubes should be operated between 2½ to 3 1/10 volts. If an A eliminator is used, the 15 ohm rheostat should be turned on full, with the A eliminator at its lowest point then the A eliminator adjusted until the reading on voltmeter is 3 3/10 volts. This will put 4¾ volts on the other tubes in the set.

The .000055 regenerative condenser located on the base-panel is not critical and should be set so that plates are nearly in full mesh. This can be found by trial when a distant station is tuned in. Be careful to use the Stator connection for the wire that leads to #620 transformer, (that is the lug on the bottom of the condenser when it is mounted in position).

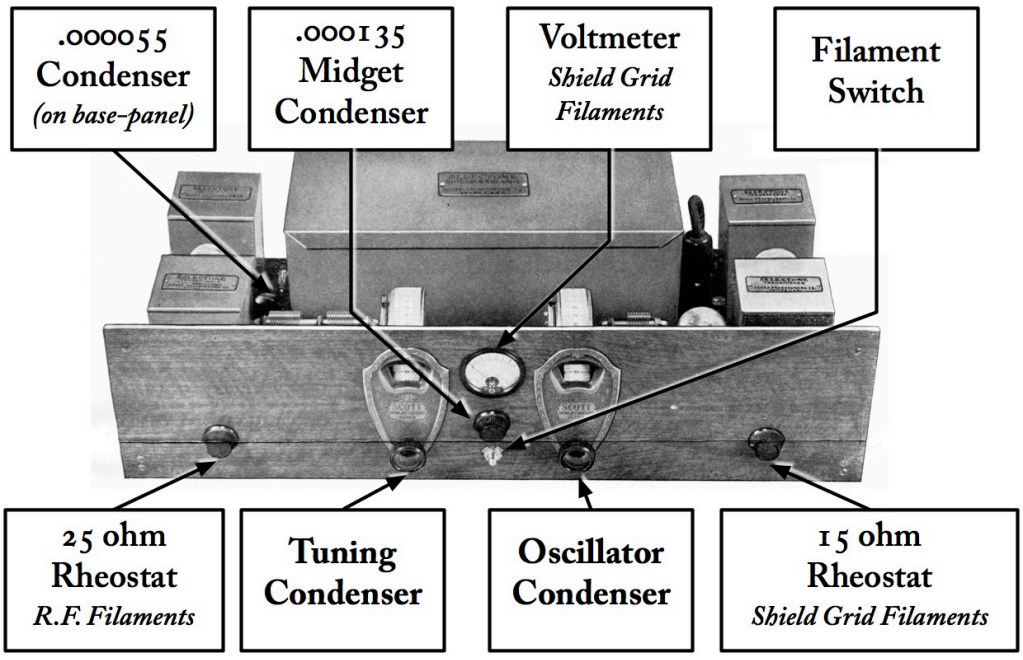


Figure 2. Location of Controls on the S.S.G.9 front-panel

HOW TO MAKE BOTH DIALS LINE UP:

After you have used your receiver for a night or two and have become accustomed to tuning it, and have logged a few stations, select one a few hundred miles distant that comes in about a dial reading of 50. Carefully tune both the dials, getting station as loud and clearly as possible, then note the reading on both dials. If the oscillator dial does not read the same as the R.F. dial, then turn the adjusting screw on the trimmer plate on the oscillator condenser in or out until you have both dials reading the same. You will find that all stations will come in on both dials at approximately the same reading from the bottom to top of scale. The log attached will give you an idea as to how the dials run.

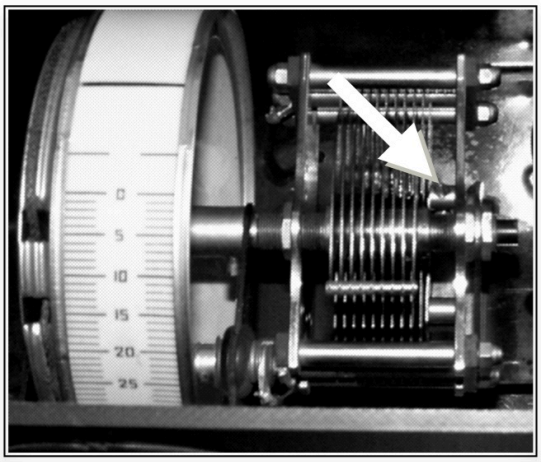


Figure 3. Location of Oscillator trimmer plate adjustment

SECOND STAGE OF AUDIO INCLUDED IN POWER PACK.

Only one stage of audio is included on the base-panel of the receiver. A second stage of audio using the 9th tube has been incorporated in the power pack specially designed for the S.S.G.9. While only one stage of audio will give you all the volume required for the average home, the second stage of audio must be used if you wish to secure great volume combined with perfect tone quality.

The reason the second stage of audio is not incorporated on the sub-panel of the set itself is to simplify the wiring and also to eliminate the necessity of running the wires to the set for the high voltages necessary to operate the #350 power tube. Another reason was the fact that the power tube used in the second stage of audio obtains all its power-- A, B and C, from the power pack, and this being so the most convenient place for putting the power stage is right with the power pack. The new SCOTT SHIELD GRID NINE POWER PACK AND POWER AMPLIFIER will automatically give you the exact plate voltages required for all tubes and if used with the set will insure your getting maximum results from it. A special tapped resistance is supplied which eliminates all variable controls.

TIPS ON TUNING

You will find it necessary to stop the R. F. tube from oscillating, to keep the rheostat controlling it turned down more on the lower wave lengths than is necessary on the higher wave lengths. When you have a station tuned in, you can turn this rheostat on until the receiver begins to squeal, then turn back until the squeal disappears. You will then have your R. F. stage operating at maximum efficiency.

Now tune in the station using both dials until you get the maximum volume and best tone quality, and control the volume by means of the 15 ohm rheostat on the left. This will enable you to regulate the volume from a whisper to maximum volume. The small Midget condenser in the center of panel is used to bring in distant stations with maximum volume and also to clear up interference.

ANTENNA

The best antenna to use with the SCOTT WORLD'S RECORD SHIELD GRID NINE is one 75 feet long, including the lead-in. You will find that you will get better results with the antenna facing in one particular direction. In Chicago, on the North Side, stations on both coasts come in best with the aerial facing East and West. However, if you are near a very powerful broadcasting station, a little experimenting with the direction of your aerial will enable you to eliminate this station easier.

If you find it necessary to erect a pole to tie far end of antenna to, use if possible a wooden pole. Of course an iron pipe can be used if it is not possible to secure a long enough wooden pole.

KIND OF WIRE TO USE IN ANTENNA.

Use stranded, enameled copper wire consisting of from seven to nine strands. If a bare copper wire is used for an outside. antenna it will quickly corrode and soon the efficiency or the antenna will fall off. If you cannot secure the stranded, enameled wire, the next best thing is a rubber covered wire, such as is used for wiring outside electrical lines.

ANTENNA INSULATORS.

At the far end of the antenna wire, that is--at the end farthest from the receiver, you should use two glass or porcelain insulators. Where an iron pole is used three insulators arranged in series will be better so that the actual end of the antenna will be as far as possible from the iron pole.

If a tree is used to fasten the far end of the antenna to, bring a piece or wire out far enough so that the antenna wire itself does not touch any of the branches. Always use a fairly flexible spring about a foot long and about ¾ inch in diameter between the tree and the antenna. If this is not done, you will probably have a good deal of trouble with your antenna breaking when the tree sways during a storm.

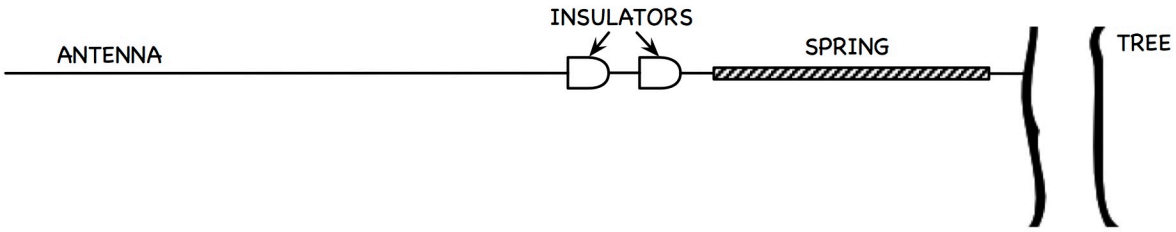


Figure 4. Antenna setup when a tree is used.

BRINGING IN THE LEAD-IN.

The part of the antenna that comes down the side of the house into the receiver is called the "lead-in". It is important that the lead-in should be kept as far away as possible from the side of the house. If you can, keep it at least a foot away. This can generally be done by running a guy-wire from he side of the house with an insulator at the end, passing the lead-in through the insulator, then down to the window frame. Or you can, if necessary, use a standoff insulator that is sometimes supplied with antenna kits. Near the window where you bring in the lead-in use a porcelain insulator.

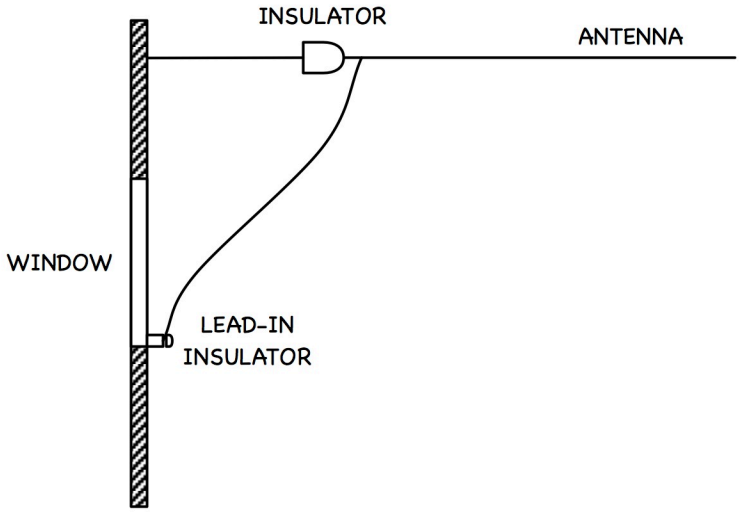


Figure 5. Antenna lead-in.

Pull the antenna as taut as possible; if it is slack your signal will fade in and out when the weather is stormy and the antenna sways to and fro.

LOCATION OF ANTENNA

If you are in a location where there are a number of other antennae, if you possibly can, run yours at right angles to the others. If you are very close to another antenna running parallel with yours, you may often be mystified by the fading in and out of the program you are listening to. This is caused by the person using the other antenna tuning in the same station and stealing the signal away from you. Of course, very often you may do the very same thing for your neighbor, but remember the best results are secured when your antenna is as clear and as far as possible from all other antennae.

CAUTION!! Under no circumstances must the antenna be connected to a telephone or electric pole, nor must you allow the antenna to pass over electric light or telephone wires. There are two reasons for this: In the first place, many deaths have occurred through people touching bare electric light wires and being electrocuted. The second reason is that if you are very close to an electric light line you will almost surely pick up interference from it and get an annoying hum in the receiver that you will be unable to eliminate until you get further away from the electric light line.

GROUND

A good ground is absolutely necessary if you wish to secure maximum results from your receiver. A poor ground adds resistance to the antenna circuit, lessens the sensitivity of the receiver, and makes tuning very broad, and is often responsible for poor volume, especially on distant stations. If you have a good, low resistance ground, you will be surprised at the difference it will make in the results you will secure.

The best ground to use is a copper plate with your ground wire soldered to it and buried five or six feet in damp earth. The next best ground is a ground clamp with wire on a cold water pipe. If it is not possible to use a copper plate or connection to a cold water pipe, you can also use a radiator pipe, or if near a window on the ground floor, drive a piece or galvanized pipe four feet long and about ½ inch in diameter into the ground leaving about three inches of it above the ground and fasten your ground wire to this.

WIRING UP SET FOR USE WITH ELECTRIC PICK-UP PHONOGRAPH

The separate sketch shows the changes in wiring necessary. The WHITE wire coming out of the Shield Grid Amplifier can, instead of going directly to the P of the #640 audio transformer goes to #4 binding post. The P lead from the #640 audio transformer goes to binding post #3. Binding post #5 connects to the RED A- terminal on cable base.

HOW TO CONNECT PICK-UP:

The first thing to connect up is the single pole double throw switch. This should be ins installed on the phonograph. Run a lead from binding post #3 and connect it to the center pole of switch. Run another lead from binding post #4 and connect it to one of the outside terminals of switch. The other outside pole of switch connects to one wire of phonograph pick-up. The other side of phonograph pick-up connects to binding post #5.

HOW PHONOGRAPH PICK-UP SWITCH OPERATES:

With this switch it is not necessary to use any adapter on detector tube or remove any tubes from set to operate phonograph. You simply leave the set turned on. When you throw the switch to one side you hear the program from the broadcasting studio. When the switch is turned to the other side you hear phonograph music. You can leave a station tuned in, then switch from phonograph to radio, or vice versa, immediately.

POWER AMPLIFIER NECESSARY FOR PHONOGRAPH PICK-UP:

To obtain any degree of volume from a phonograph pick-up, it is absolutely necessary to use a second stage of audio with at least a #171 power tube. The ideal combination is the SCOTT POWER PACK and POWER AMPLIFIER. This will give you tremendous volume with perfect tone quality either from program from broadcasting studio or from your phonograph records.

Figure 6. The S.S.G.9 mounted in a Tasman cabinet, which allows receiver, power pack, and electric phonograph to be combined into a single unit.

C O N S T R U C T I O N and W I R I N G I N S T R U C T I O N S

F O R T H E

S C O T T P O W E R P A C K and P O W E R A M P L I F I E R

After unpacking all parts proceed to assemble them on the metal baseboard.

First assemble all binding posts and the four speaker tip jacks on the bakelite sub-panel. The position of each of these is clearly indicated on the top view of the amplifier. When you have done this, attach the bakelite panel to the metal baseboard by means of the screws marked #1-2-3 and 4. When the bakelite panel is attached as above, screw one of the small brackets supplied with resistor to the steel baseboard, then insert end of resistor keeping the taps facing towards the back. Now, push end of the other bracket into the other end of resistor and screw bracket to metal baseboard. The screws marked #5 and #6 for resistor also hold bakelite panel to metal baseboard.

You can now attach the #641 Selectone Audio Transformer and the #642 Selectone Output Transformer to baseboard. Next, attach the #643 Selectone Power Transformer and the #644 Selectone Choke by means of the screws at outside ends. You now place the flanges of the condenser bank under the flange of the choke and transformer and after lining up slots in condenser insert screws and fasten to baseboard. Make sure that name plates read as shown on the top view of amplifier.

Unfasten screws on end of plug on braided wires for light socket bringing wires through hole in metal baseboard, then attach wires to plug again.

****THIS COMPLETES THE ASSEMBLY OF PARTS.****

SOLDERING

No POWER AMPLIFIER or receiver can operate satisfactorily unless every connection is properly soldered. Just one poorly soldered connection will ruin the operation of the amplifier. If connections are not soldered properly, the slightest vibration will ruin the reception from your set. It is absolutely necessary, therefore, that particular care be taken to see that every soldered connection is perfect.

It is impossible to make a perfect soldering job unless you have a good soldering iron. A good iron will cost you a little more, but it is well worth its price. We have tried out many makes of soldering irons and have found the "American 'Beauty" the best and one that will last indefinitely.

HOW TO SOLDER:

Use nothing but rosin core solder, never use acid. A very small amount of soldering paste may be smeared on end of wires and connections. However, always be sure to immediately wipe each connection with a piece of cloth to remove every trace of the paste as soon as joint is soldered as any trace of it left will cause trouble later on.

To make a perfect soldering joint, place tip of soldering iron on connection or joint for about two seconds to heat it up, then touch end of iron with solder. Allow just enough to make a good joint or connection.

If you use a poor soldering iron it very often does not heat up joint enough to thoroughly sweat solder into it with the result you have what is known as a cold solder joint that may look all right, but it is really a high resistance joint. If you are sure that every soldered joint is perfect, you can rest assured that your power pack and amplifier will give you every satisfaction.

WIRE USED:

With the amplifier kit you are supplied with sufficient black flexible wire to make what extra connections are required outside of those coming from the transformers, choke, and condenser bank. All leads coming out of the various transformers, you will notice have different colors. Be careful not to cut off these leads too short. Take your time about the job so that you can do it properly. It is necessary that all apparatus be grounded to base, otherwise you may get a hum. Carefully scrape around base of transformers where head of screw goes through and also bottom of base around nut, so that the transformer will be properly grounded.

WIRING

WIRES #1&2:- These are the YELLOW wires coming out of condenser bank and #644 choke. Bare ends of wires about one inch and twist them together and solder.

WIRE #3----- Bare one end of wire about one inch, then twist around joint made between wires #1 and #2 and solder. Now, wrap joint with piece of black insulating tape. The other end of the wire is soldered to tip jack D-2.

WIRE #4------ Connects to speaker tip D-2 and lug on binding post F-2.

WIRE #5------ Connects RED wire running out of condenser bank to RED wire from #644 choke, Bare end of wires about one inch, twist together and solder, then wrap joint with black insulating tape.

WIRE #6------ Connects GREEN wire coming out of power transformer #643 to GREEN wire coming out of Choke #644. Bare end of wire about one inch, twist and solder.

WIRE #7------ Connect BLACK wire coming out of #643 power transformer to black wire coming out of condenser bank. Bare end of wire about one inch, twist and solder.

WIRE #8------ Bare end of length of black flexible wire about one inch, then twist and solder to joint made by Wire #7. Wrap joint with black insulating tape. Solder the other end of this wire to end of lug on resistor marked G.

WIRE #9------ This is the YELLOW wire coming out of power transformer #643 and connects to end of lug on resistor marked H. Now, twist the two WHITE wires together that come out of power transformer #643.

WIRE #10----- Connect one of the WHITE leads mentioned above to the F+ contacts on the #381 tube sockets.

WIRE #11----- Connect end of the other WHITE wire to the two contacts on the #381 tube sockets. NOTE: It does not matter which of these leads to the F+ or F, providing one WHITE wire connects to the two F+ and the other WHITE wire connects to the two F-.

WIRE #12----- This is the RED wire coming from power transformer #643 and connects to P contact of first #381 tube socket.

WIRE #13----- This is the other RED wire coming from the power transformer #643 and connects to the P of the 2nd #381 tube socket.

WIRES #14&15- These are the BROWN wires coming out of power transformer #643. Twist them together and connect the end of one of them to F- and the other to the F+ contact on the #350 tube socket.

WIRES #16-19- These are the BLUE wires coming out of the condenser bank. Solder to lugs on resistor marked C.D. and H. Note two blue wires are soldered to lug C.

WIRE #20----- This is the BROWN wire coming from #642 Selectone output transformer and connects to speaker tip jack #S-1.

WIRE #21----- This is the BLACK wire coming from #642 Selectone output transformer and connects to speaker tip jack #S-2.

WIRE #22----- This is the GREEN wire coming out of #642 Selectone output transformer and connects to binding post lug #F-2.

WIRE #23----- This is the RED wire coming out of #642 Selectone output transformer and connects to P contact on #350 tube socket.

WIRE #24----- This is a separate flexible black wire one end of which connects to P contact on #350 power tube socket and to Speaker tip jack D-1.

WIRE #25----- This is the RED wire on #641 Selectone Audio Transformer and connects to lug on input binding post.

WIRE #26----- This is the GREEN wire on #641 Selectone Audio Transformer and connects to lug on B-135 binding post.

WIRE #27----- This is the BLACK wire coming out of the #641 Selectone Audio Transformer and connects to lug on B- binding post.

WIRE #28----- This is the BROWN wire coming out of #641 Selectone Audio transformer and connects to G contact on #350 power tube socket.

WIRE #29----- Connects lug on resistor marked B to lug on #F-1 binding post.

WIRE #30----- Connects lug on resistor marked C to lug on B-135 binding post.

WIRE #31----- Connects lug on resistor marked D to lug on B-90 binding post.

WIRE #32----- Connects lug on resistor marked E to B-45 binding post.

WIRE #33----- Connects lug on resistor marked G to lug on B- binding post.

WIRE #34----- Connects lug on resistor marked A to lug binding post #F-3.
WIRE #35----- After cleaning off enamel around nut on sub-panel, place lug under nut. Now connect lug under nut to lug on resistor marked G.

You will notice two BLACK leads coming from a Dynamic Speaker using 90 V. field, and the ends of these wires are inserted in the binding posts marked F-1 and F-2. The tips on the end of the speaker cords are inserted in the jacks marked DYN SPK.

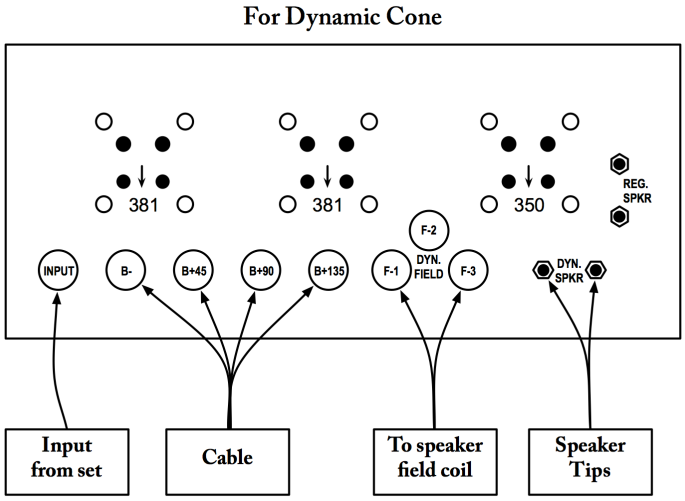


Figure 7. Power Pack connections for Dynamic Speaker.

It is strongly recommended that you use a Dynamic speaker with this amplifier. It will enable you to get considerably more volume without distortion or blasting than is possible with any other type of speaker. If, however, you already have a good speaker and do not wish to go to the extra expense of buying a Dynamic, you can use your present speaker by connecting Binding Posts F-2 and F-3 together with a piece of Bus wire. Be sure to insert the speaker cord tips for an ordinary speaker in the tip jacks marked REG SPKR.

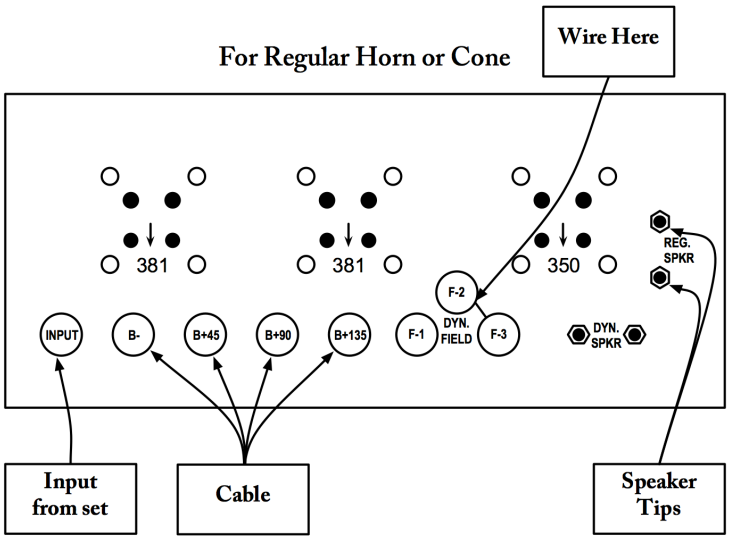


Figure 8. Power Pack connections for Permanent Magnet Speaker.

To make the power PACK and AMPLIFIER entirely automatic in operation, it is recommended that you use a Yaxley Automatic Relay #440. This instrument will automatically switch off the power pack and switch on the battery charger when the filament switch is turned off. When the filament switch is turned on, it will automatically turn off the charger and turn on the power pack and amplifier. It also automatically turns off charger when battery is fully charged. It will be found that when this combination is used, it will not be necessary to look at the A battery more than about once three or four months. One of the most satisfactory chargers for the A battery is the Kuprox Homecharger with both a trickle and booster charging rate.

I N S T R U C T I O N S

FOR USING SHORT WAVE COILS ON THE

SCOTT WORLD'S RECORD SHIELD GRID NINE

When the SHIELD GRID NINE is to be used for both broadcast and short wave reception, a fixed condenser of .0008 capacity NOT furnished with the short wave coils may be installed in the oscillator to make tuning easier on the low waves. However, these are not absolutely necessary as the short wave coils will work without them.

The condenser is installed by drilling two ¼" holes directly in back of oscillator tube socket, the first hole being 1-1/8" from the center of the tube socket, the other hole being 1-3/16" in back of the first. The two tip jacks furnished with the condenser are then mounted in these two holes; then disconnect the wire from the stator plates of the .00035 single condenser from the oscillator tube socket and connect this wire from the stator plates to one of the tip jacks. The run a wire from the other tip jack to the G terminal of the oscillator tube socket. When the .0008 condenser is plugged into the two tip jacks, it is in series with the grid load of the oscillator condenser. The above part can be purchased for $1.00 net.

For broadcast reception the bakelite connector plug is inserted into the two tip jacks and for short wave reception the .0008 condenser is inserted into the two tip jacks, then remove the #630 coil and put the antenna on the binding post marked S-Ant. Replace the #620 coil with the #621 coil for the 35-90 meter bad and the #622 for the 20 to 50 meter band. Replace the #610 with the #611 for the 35 to 90 meter bad and the #612 for the 20 to 50 meter band. If you do not use the .0008 condenser and shorting strip, the only operation necessary for tuning in short waves is the changing of coils as explained above.

Adjust the regeneration condenser on the subpanel until the intermediates oscillate when the 15 ohm rheostat on the right of the panel is turned all the way on. The station should be tuned in first by locating the carrier wave or squeal on both dials, then turn the 15 ohm rheostat back until the station comes in clear. For C.W. signals the intermediates should be made to oscillate by turning up the 15 ohm rheostat.

The oscillator dial will tune very sharp while the R.F. dial is somewhat broader, both dials can be made to track by using the trimmer condenser in the center of the panel.

A list of short wave broadcasting and television stations follows:

STATION	WAVE LENGTH
KDKA	63.66
WLW	52.02
WCFL	37.24
WGY	35.
WNRY	30.91
WOWO	32.8

HINTS ON TROUBLE SHOOTING ON THE

SCOTT WORLD'S RECORD SHIELD GRID NINE

RECEIVER DEAD:

1) Is the filament switch turned on?

2) Do all tubes light?

3) Is the A.C. current turned on "B" eliminator or Power Pack? See that both rectifying tubes light.

4) Have you the aerial and ground connected?

5) Are the speaker taps pushed all the way into small Carter jacks in Power Amplifier?

6) See that all leads from the intermediate amplifier are properly connected to the cable plug.

7) See that the springs shielding the grid leads of the shield grid tubes do not touch the tips on the top of these tubes.

8) See that tuning condenser plates do not scrape, and keep clean from pieces of solder, ends of wire, etc.

9) Make sure that all coil prongs are clean; sandpaper them to make sure. See that the prongs make proper contact with the contacts on the sub-panel. Lift up the set and watch the prongs and contacts as you push in coil.

10) If no station can be heard, hold the aerial on stator plates of .0004 section of gang condenser and if signal comes through, the R.F. stage is defective.

11) Tap the Second detector tube lightly with your finger and if no ring is heard in the speaker, the audio end is dead.

12) If the oscillator condenser has no effect when turning, replace the oscillator tube. Check over the wiring, coil and contacts.

13) See that the 25 ohm rheostat controls the filament of the R.F. tube properly.

14) See that voltmeter reads 3.1 volts when 15 ohm rheostat is turned all the way on and that this rheostat controls the voltage on the Shield Grid tubes properly.

TESTING STORAGE BATTERY

Test the voltmeter and see that it registers six volts before set is switched on. Better still, use a hydrometer. When battery is fully charged it will show 1280 to 1300.

Examine battery terminals. If corroded, remove and clean with sandpaper, then apply a little vaseline, and see that both negative and positive wires are clean, and make good contact when screwed down on terminal.

See that electrolyte is one-half inch above top of plates. If storage battery terminals are clean, and battery shows six volts when tested across battery terminals, test between the negative and positive terminals of a tube socket in set to make sure that the current is actually reaching the tubes.

TESTING SCOTT POWER PACK AND AMPLIFIER

First, test out the #643 Transformer and the #644 choke. On the #544 choke a click should be heard in the head-phones (if a head-phone and C battery is used for testing) or a reading in the voltmeter (if a voltmeter and C battery are used) between each terminal. If no reading is shown, or there is no click, the choke is open.

Next test the #643 transformer. There should be a reading in the voltmeter, or a click in the headphones between the two white wires and between the two brown wires on the low voltage windings, and also between the two red wires on the high voltage winding. If no reading or click is obtained between any set of windings, that circuit is open.

Next test to see if there is a reading between the high voltage and low voltage windings. If you get a reading, it indicates a shorted transformer. If either choke or transformer tests show that they are defective, they should be returned to our factory for adjustment.

Now test the resistor strip. There should be a reading obtained when tested from end to end, and a reading should also be obtained when tested between each set of taps. If there is no reading obtained between any two taps, it shows an open resistor.

To make these tests on the resistor, if is not necessary to remove it from the eliminator - simply disconnect or unsolder the lead that runs from the B negative tap.

Next test the condenser block. The most certain way to do this is by means of a 45 volt B battery, and a voltmeter. Connect the negative side of the battery to the black wire that runs from the block to the B negative on the resistor; then in turn touch the wire from the plus side of the battery to each of the other wires on the condenser. This will "charge" the condenser. Now take a voltmeter and connect the negative side to the two negative lugs on the condenser block, then in turn touch each of the wires with the lead from the other side of the voltmeter, and notice if you get a slight deflection in the voltmeter. If no deflection in the voltmeter is obtained, the condenser is "leaking." Only one indication will be obtained.

Next test to see if any particular condenser block has broken down. This can be done with a pair of headphones and C battery, or with a voltmeter and C battery. Test between the negative and each of the wires on the condenser block in turn. If any particular condenser is shorted, you will get a reading on the voltmeter. If no reading is obtained, the condenser is O.K. If, however, you do get a reading, the block has broken down and must be replaced.

If above tests show that each part of the apparatus is all right, then carefully re-check your wiring by the full size blue print we supply. If this checks up O. K. , then insert the tubes, and insert plug in light socket and test the voltages you secure between each tap. Without being connected to the receiver, you should get the following voltages:

* Between negative B and 45, you should get about 90 volts.

* Between negative B and 90, you should get about 150 volts.

* Between negative B and 135, you should get about 200 volts.

* Between negative B and 245, you should get about 500 volts.

* Between negative B and end of resistor from which you obtain C bias for 250 power tube, you will get no reading until the cable is connected to set and 250 power tube is lit. It should then show about 72 volts.

All these tests must be made with a high resistance voltmeter. The ordinary voltmeter will not show the correct voltages.

If these voltages appear to be O.K., then connect to receiver and turn filament current on tubes. If the Power pack is functioning properly, and there are no short or open circuits in your receiver you should get the correct voltages between each set of taps.

If you find that you get very low reading between, say B negative and 45V tap, or between B and 90V tap, or B and 135V tap, it indicates that you have a short circuit in the wiring of the receiver. You can make another check for this fault by removing the lead from the binding post on Pack. If you now get a reading with wire detached from one particular binding post, you have a short circuit in the leads or wiring connected to that particular circuit.

If you notice when you switch on your Power Pack that the plates in the rectifying tubes get red, it indicates that the condenser block has broken down.

If you notice that the plate of 250 power tube gets red, it shows either that the C bias is incorrect, or that the resistor supplying this bias is open.

If, as soon as you connect up your Power Pack the first time, you get a loud throbbing hum through the speaker, you should check up the connections on the condenser block, making sure that the lugs marked O or minus go to B—

negative on the resistor strip. If you do not get the proper negative connection, it means that you have no filter action.

There should be no noticeable hum in speaker when you are listening to a station. If there is any hum it will usually be found that the cans on transformers have not been grounded properly. Carefully scrape around screw holes in cans and around where nuts tighten on the bottom of base, so that all cans can be properly grounded and you will find this will eliminate the hum.

TROUBLE IN TUBES

If you have no tube tester, the next best thing to do is to remove your tubes from your set, take them to a friend who has a set operating using the same type of tubes, and place them in his receiver, one at a time, noting if the receiver functions properly as each tube is inserted. If you find that the receiver does not operate when one particular tube is inserted, it shows that it is defective. Remember; just one bad tube will upset the operation of your whole receiver. It is a good idea to have one #201A, one #340 or Ceco type G and one #222 on hand at all times, and if you are in doubt as to the condition of your tubes, take one of the new ones and insert it in the socket using this type of tube . If you are using our amplifier, have a spare #281 and #250 also. If your signal strength increases, it shows that the tube you have replaced is not working efficiently.

If you find that the receiver has a tendency to start howling when you turn up your intermediate rheostat to get any degree of volume, and especially if this occurs when you have the speaker and set together in a console cabinet, or when speaker is near the receiver, you probably have a microphonic tube. It is always a good idea to keep the speaker away from the set five or six feet. Generally, the tube in the second detector socket is the one that will cause all the trouble. To test for this, hold the second detector tube firmly with your hand, noting if the hum stops. If it does, then you know positively that the tube is microphonic. Try the other tubes in set in second detector socket, and you will probably find one that is not microphonic.

When using dynamic speaker insert the black field wires in the two binding posts marked "Dyn. field" and speaker tips in tip jacks marked "Dyn. Spkr." When using ordinary speaker-insert speaker tips in tip jacks marked "Reg. Spkr." and connect the two binding posts as indicated in blue print with piece of wire.

SERVICE

If you find after following the instructions herein given that you do not secure the results you should reasonably expect from a SHIELD GRID NINE, and are not able to get your set working properly, you can send it in to our Service Laboratory. We will go over it thoroughly, and see that it is returned to you operating properly. The charge for this service is $2.50 per hour.

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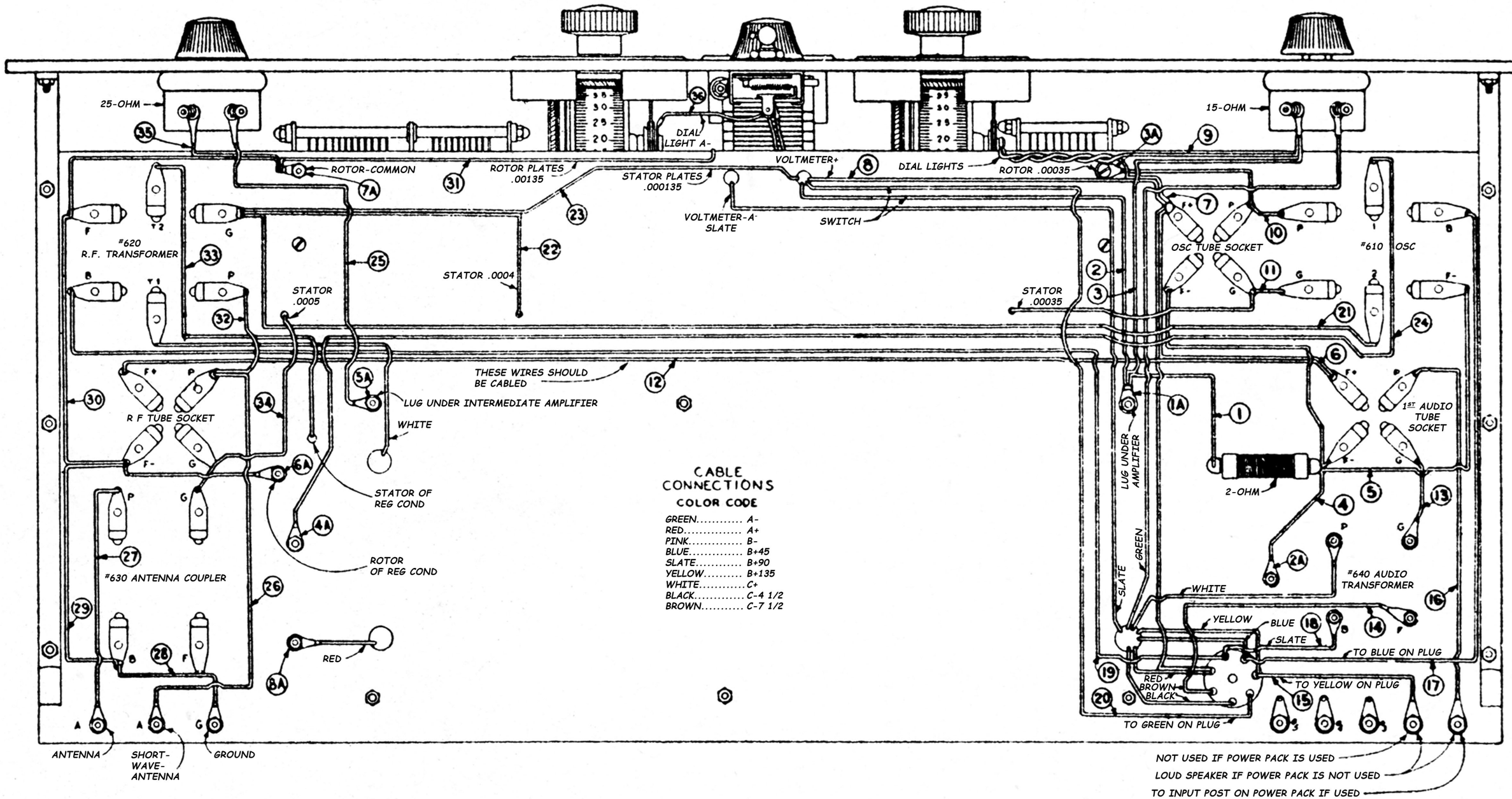
THE SCOTT TRANSFORMER CO.
4450 RAVENSWOOD AVENUE
CHICAGO, ILLINOIS



CABLE CONNECTIONS

COLOR CODE

GREEN	A-
RED	A+
PINK	B-
BLUE	B+45
SLATE	B+90
YELLOW	B+135
WHITE	C+
BLACK	C-4 1/2
BROWN	C-7 1/2

GRAPHIC WIRING DIAGRAM FOR SCOTT WORLD'S RECORD SHIELD GRID NINE

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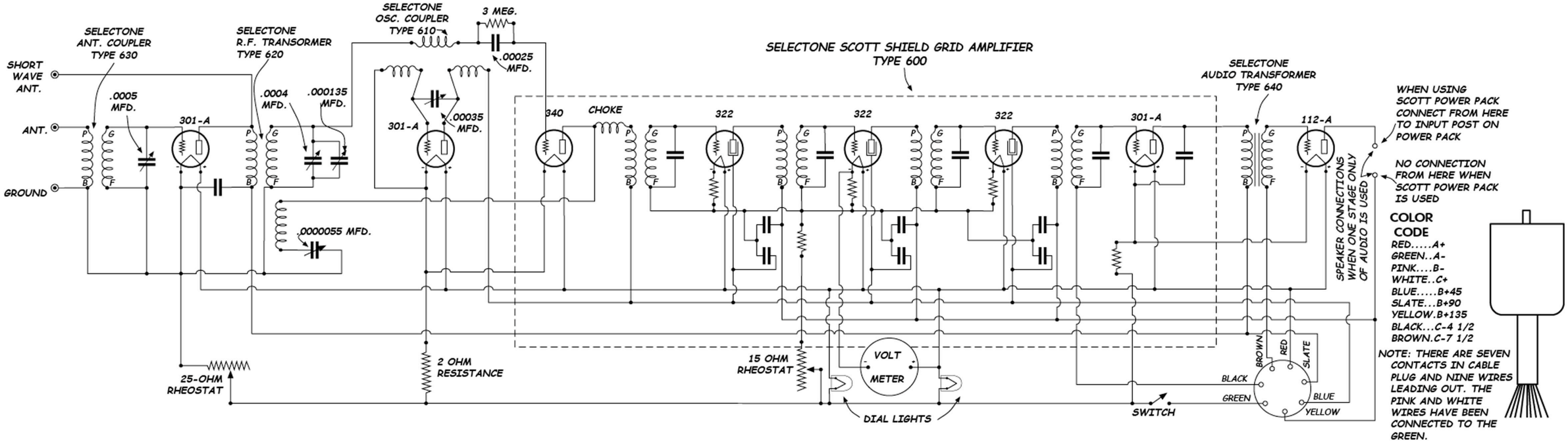
ACME DRAFTING SERVICE
CHICAGO ILL.

SCOTT TRANSFORMER CO.
4450 RAVENSWOOD AVE. CHICAGO,U.S.A



SCHEMATIC WIRING DIAGRAM FOR SCOTT WORLD'S RECORD SHIELD GRID NINE

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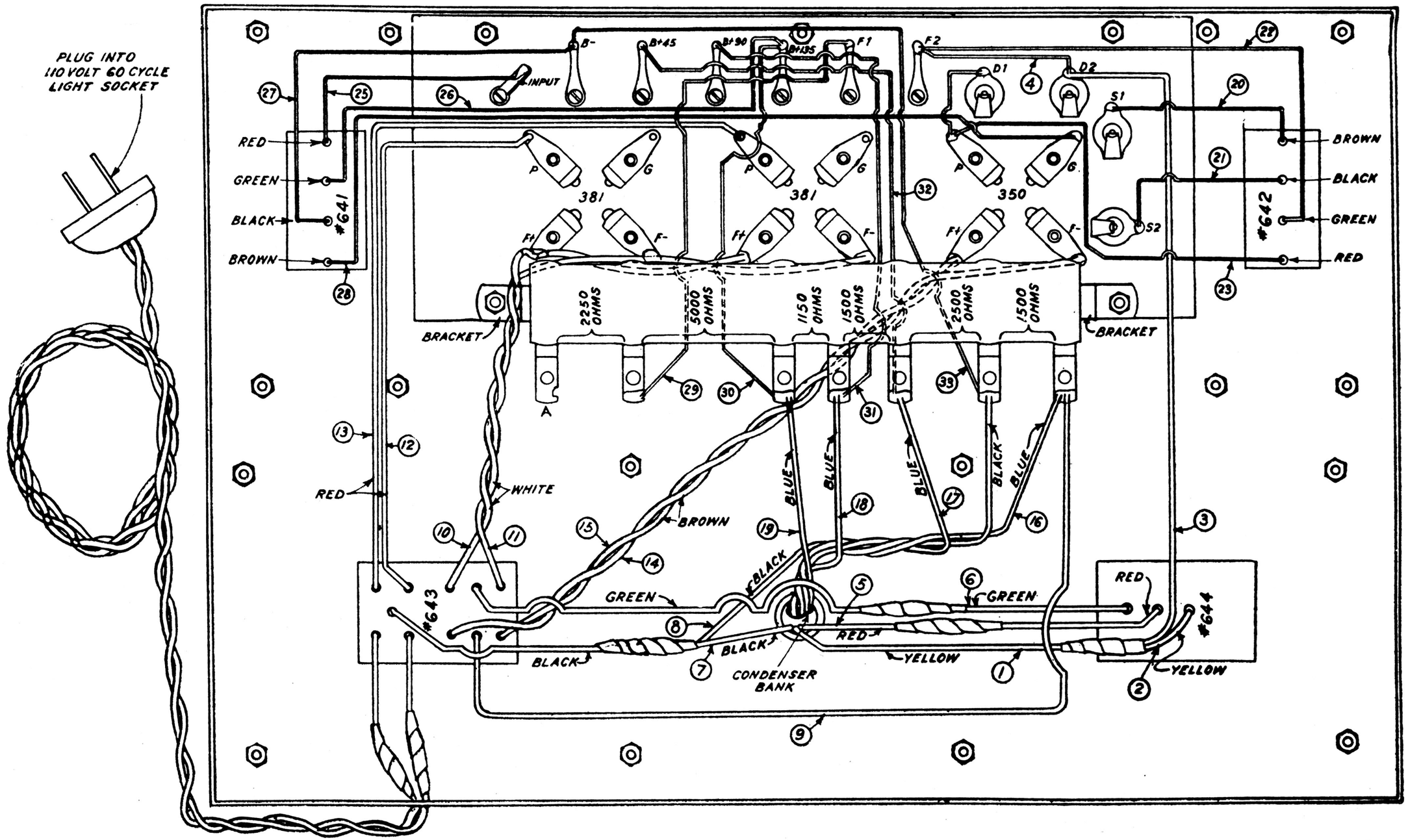

GRAPHIC WIRING DIAGRAM
FOR SCOTT POWER PACK AND POWER AMPLIFIER

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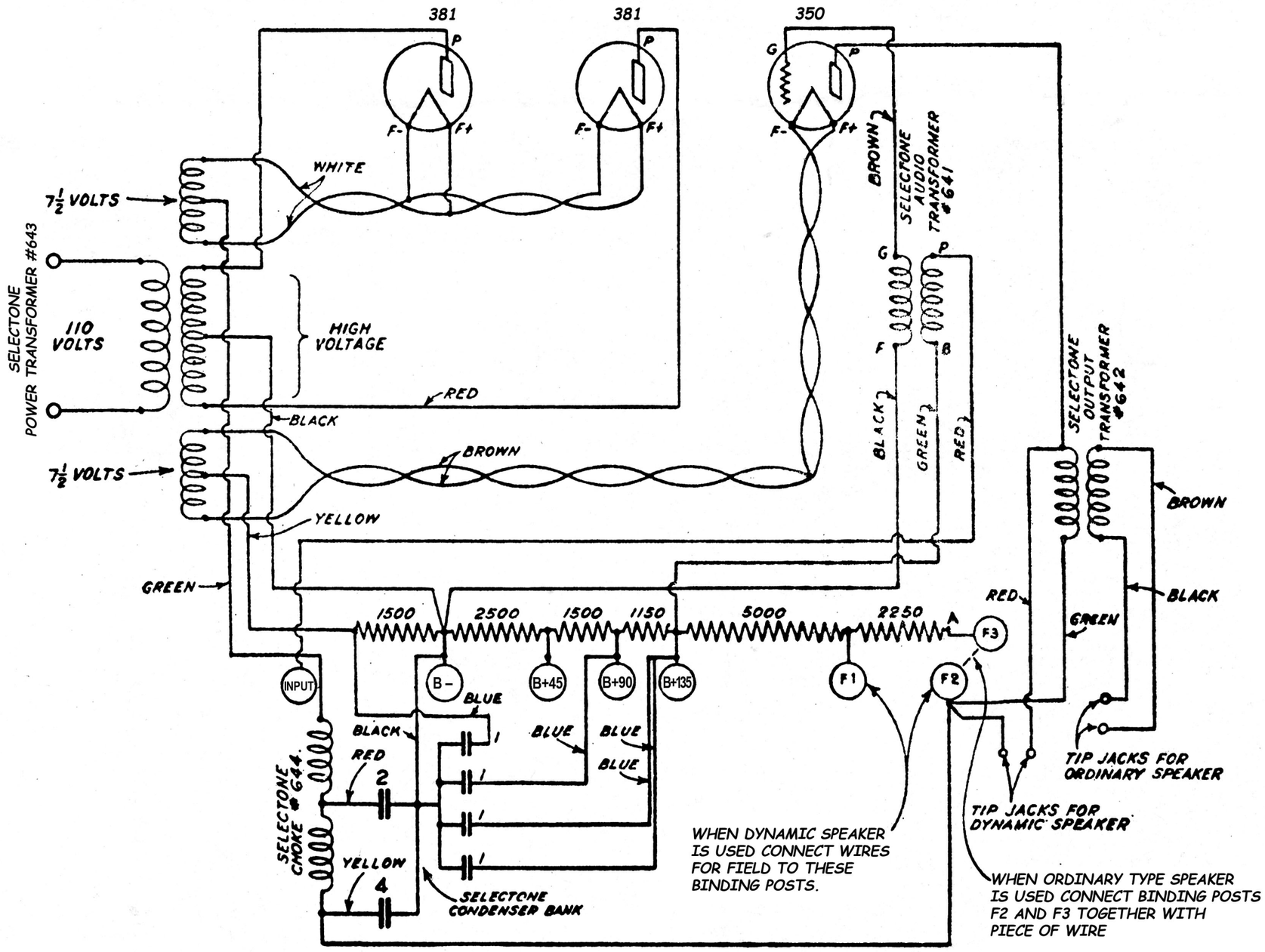

SCHEMATIC WIRING DIAGRAM
FOR SCOTT POWER PACK AND POWER AMPLIFIER

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