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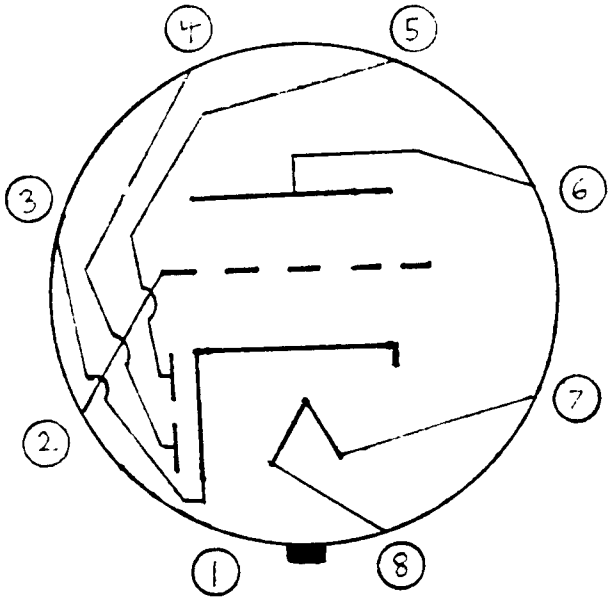
MEET THE TUBE

Skip Arey



12SQ7

Greetings campers. It is I your former Editor, turned Contributing Editor, and resident sage of tubetype lore. Best of luck to our own Dallas Lankford as he renders forth with his editorial duties in the name of our obsession. This episode of Meet The Tube brings us the 12SQ7 or 12SQ7-GT. What? You don't remember the tube?? Sure you do. Many of us encountered it or one of the other twin-diode, high-mu, triode bottles as the main component of a code practice oscillator. Such a circuit using a 35Z5 rectifier is often found in the back of old RCA tube manuals. The metal type 12SQ7 and the glass-octal type 12SQ7-GT were used as combined detector, amplifier, and AVC tube in AC/DC radio receivers. Heater voltage is 12.6 volts AC or DC at 0.15 amperes. The only directly interchangeable tube for the 12SQ7 is the 6BC3.

SHORT CONTRIBUTIONS

R-390A DESIGN: The past week I received a very exciting package in the mail which contained two Collins engineering reports on the R-390 family of receivers. The reports have been reproduced and offered for sale by Frank Gentges, AK4R, 9251 Wood Glade Dr., Great Falls, VA 22066. The engineering report on the design of the R-389, R-390, and R-391 is $15 postpaid, and the engineering report on the R-390A is $10. The first report contains all sorts of information, such as the development of the receivers, why they designed them as they did, problems encountered and solutions, problems for future study, circuit descriptions and discussions, and many photos. The report is about 3/8 inches thick. One example of what's in the report - original specs called for the R-390 to be immersion proof. Initial tests found so much heat was generated inside the sealed cabinet that a cumbersome external cooling system was needed. Subsequently, this spec was dropped by the Signal Corps, and a separate receiver, the R-392, was developed to meet the requirement. This report was just declassified in May through Frank Gentges' efforts, and he deserves a pat on the back and a 3TF7 for taking the initiative to reproduce these fine documents. The second report is mainly a Collins study to reduce the cost of the R-390, resulting in the R-390A. Again, lots of detailed information and photos. These reports are a must for the R-390 afficionado - fascinating reading, well worth the price. (Jay Mathisrud) [I certainly agree with your comments about these reports from what I have seen. The second report is titled "Cost Reduction Program For Radio Receivers, R-390/R-391( )/URR," Final Progress Report, Period Covered To: 20 Feb. 1956. The report is 31 pages of single spaced text, plus 28 pages of pictures (35 figures). From comments in the text it is apparent that the period covered is actually to about Sept. 1956. Also, five figures are missing: functional diagram for the mechanical tuning of the R-390A and R-391A, schematics for the R-390(XC-3) and R-391(XC-2), and the final cost analysis for the R-390( )/URR. I guess the government is still keeping some details secret. (Ed.)

AM PRESS/EXCHANGE: The AM Press Exchange is the only amateur radio publication devoted to amplitude modulation. Each month there are articles on AM transmitters, older receivers, surplus conversions, AM happenings on the Amateur bands, and free ads. It also keeps AM operators informed of threats to their operating privileges. Sample copies are $1, and subscriptions $9, from AM Press Exchange, Route 1, Box 281, Woodlawn, TN 37191. (Jay Mathisrud)

MANUAL SOURCES: (1) Mike Consalvo, 7218 Roanne Drive, Oxon Hill, MD 20745, send SASE for current list, (2) Wayne D. Russell, 9410 Walhampton Dr., Louisville, KY 40222, send SASE for current list, (3) Military Technical Manual Service, P.O. Box 15062, Long Beach, CA 90815-0062, send $3 for a 60 page catalog. (Joe Bunyard)

3TF7, 26Z5W PRICES: As of November 12, 3TF7 @ $15 each, 26Z5W @ $5 each, from Daily Elecrtonics, P.O. Box 5029, Compton, CA 90224. (Joe Bunyard)

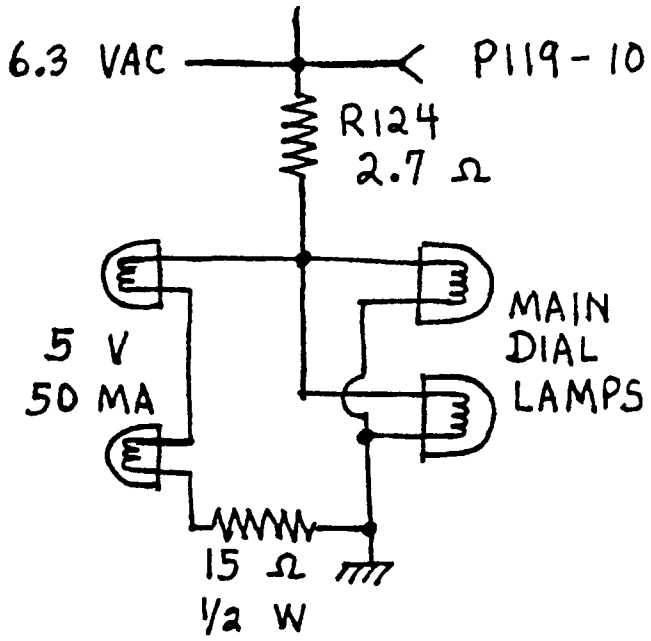
ANTIQUES: Antique Radio Classified, 9511 Sunrise Blvd., # J - 23, Cleveland, Ohio 44133 publishes a very nice bulletin, $12 per year (12 issues). The two issues I have received so far were 24 pages each of reduced type, similar in format to many MW and SW club bulletins. The print quality and layout is very well done. A bulletin typically contains about half wanted/for sale ads, and about half articles with pictures. Picture quality is excellent. Emphasis seems to be on radio receivers of the 1920's and 1930's, but tubes, speakers, headphones, and other parts ar also included. If you are interested in antique radios, write them for information and a subscription form. The information packet I received

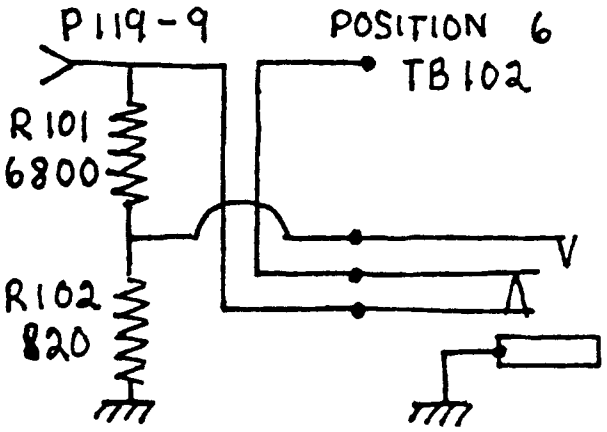
also contained an address list of antique radio clubs throughout the USA. In case you didn't know, two useful guide books for antique radios and parts are Vintage Radio, 1887 - 1929, and A Flick Of The Switch, 1930 - 1950, by M. E. McMahon. Both books are available for $9.95 each, plus postage, from Fair Radio, P.O. Box 1105, 1016 E. Eureka St., Lima, Ohio 15802, phones: 419/223-2196, and 419/227-6573. (Dallas Lankford)

PARTS SOURCES: (1) Electronictown, Inc., 440 7th Ave., P.O. Box 2048, San Diego, CA 92112, phone: 714/232-9379, ATTN: Murray Anker, very helpful on military gear, has tubes, LS-166/U's, connectors, etc., reasonable prices, (2) Unity Electronics, Inc., P.O. Box 213, 107 Trumbull St., Elizabeth, NJ 07206, phone: 201/351-4200 and 212/571-0870 for information, or 1-800/631-7346 to place an order. (Joe Bunyard)

R-390A METER LIGHTING: I was unhappy with the lack of meter lighting in my R-390A, and feeling adventurour, I installed small 5 volt 50 ma lamps inside the meter cases. A schematic of the meter lighting mod is given below. First, remove the metersfrom the receiver, tagging leads. This can be done without removing the front panel with patience. Remove the front plates from the meters, and then gently remove the circular glass plates. They may be cemented, so be careful not to break the glass. I used a tiny jeweler's screwdriver to gently pry the glass plates loose. After the glass plates are removed, the meter movements can also be removed and set aside out of danger.

In my meters it was necessary to clip off a small appendage on the movement spring to make room for the lamp near the very front of the case. A small hole is drilled through the rear of the metal meter case for the wire and lamp installation. I took AC power from the low voltage end of R124 which is a dropping resistor for the main dial lights. It is located on TB101 on the front panel, and the connection can be made without front panel removal. I used a series connection with a 12 ohm 1/2 watt series dropping resistor, hoping to reduce any heat generated (none is apparent), and obtain long lamp life since replacing them will obviously be a pain. I placed the 12 ohm resistor at the end of the line, and grounded is to a solder lug attached to the line level meter mounting screws. Paint on the front panel must be scraped off to make a good electrical contact. Whew! It sounds complex, but it isn't - just don't try to hurry. (Gerald Murphy)





R-390A SPEAKER DISCONNECT: The original phone jack on the front panel can be replaced speaker disconnect jack. Just unsolder the wire from position 6 of TB102 and run two switching wires to the front panel along the partition between the PTO and AF sections. (Gerald Murphy)

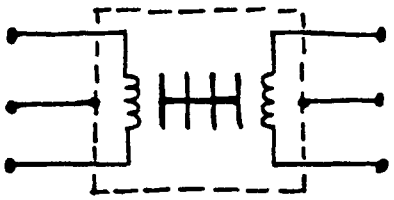
R-390A EXPERIENCES: Greetings from a fellow R-390A afficianado. I am typing this from my home located on a salt pond in a marshy area near Narragansett, RI. Reception here is nothing short of excellent. Equipment presently includes two R-390A's and three R-388's, and antennas are numerous longwires and whips. There are also a few scanners, and the obligatory CG and Ham rigs. The 390's cap a dream I've had since being exposed to them at a Navy COMMSTA twelve years ago. Both came from Fair Radio Sales. One is built by EAC, vintage 1960, and has always been good. The second was built by Motorola, ventage 1956, and has been to say the least been a dog. A 390 isn't much to brag about if its sensitivity is only capable of pulling in the local AM'er on a twh hundred foot long wire. Since it was sold "checked" by Fair, and they are very good about that, I started digging. [I wasn't under the impression that Fair was all that thorough, with "checked" meaning "someone turned it on and it seemed to work OK". A lot may be left for the customer to do, as is related in this experience. Ed.] Of course, all tubes checked fine on a commercial tube tester, and about half later proved to be bad. I shudder to think how many tubes I've chucked out because the tester said they were "bad." The only way is to substitute with a known good tube. However, sensitivity was still poor, and improved only slightly after alignment. Selectivity and stability were excellent. Then I read the HSN suggestion about substituting a 6BA6/5749 for the 6DC6 RF amp (V201). With this change, sensitivity improved dramatically. I made the substitution on the other rig with even better results. Also, for greater audio gain, I substituted 12AT7's for 12AX7's [5814A's ? Ed.] in the audio module. And one night while rummaging through a tube treasure box given me by my fine lady friend, I located several 6J6/6101 tubes. These are twin triodes similar to the 6C4 mixers in the R-390A. I used 6J6's for V203 and V204, and wham, signals were jumping out of the set with formidable power. The substitute tubes run plenty cool, and there is no strain on the receiver. (Paul Zecchino)

HQ-180 DIODE MOD: I recently bought a much used HQ-180, # 1808, and made a few mods. The first priority was getting rid of the 5U4-GB, and its fifteen watts of heat. I couldn't find any 2000 volt solid state diodes, so I went with RCA's rated at 1000 V 3 A, mainly because it seemed they would dissipate heat better than the 1 A units. The diodes were mounted topside using subminiature phone plugs soldered to one end each of the diode leads. These are then plugged into the 5U4 socket at pins 4 and 6. They just fit. The other ends are tied together and go to a 250 ohm 20 W resistor, again mounted topside with a 8/32 bolt through the center and chassis about 3/4 inch in front of the 5U4 socket. From the other end of the power resistor, another lead goes to another subminiature plug, which in turn goes to pin 2 of the 5U4 socket. The B+ voltage was about 275 before the mod, and about 260 after the mod. The power resistor dissipates about 4 W, so the mod should run cool and last. (Al Merrill)

COLLINS DISC-WIRE MECHANICAL FILTERS
Part 2

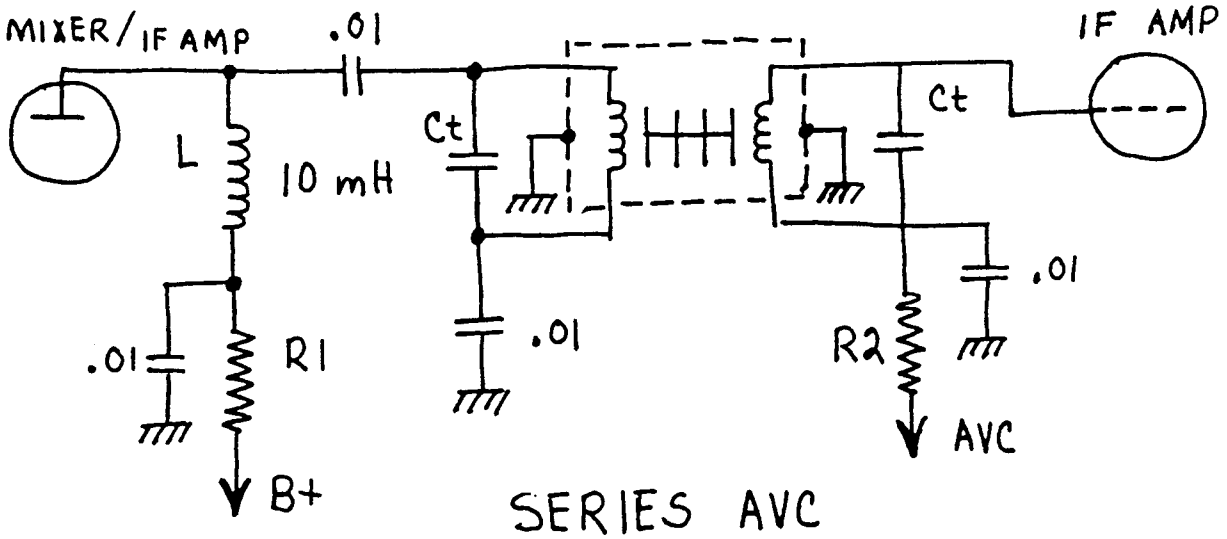
Dallas Lankford

There is apparently no universally agreed upon schematic symbol for mechanical filters, so we have adopted the symbol below.

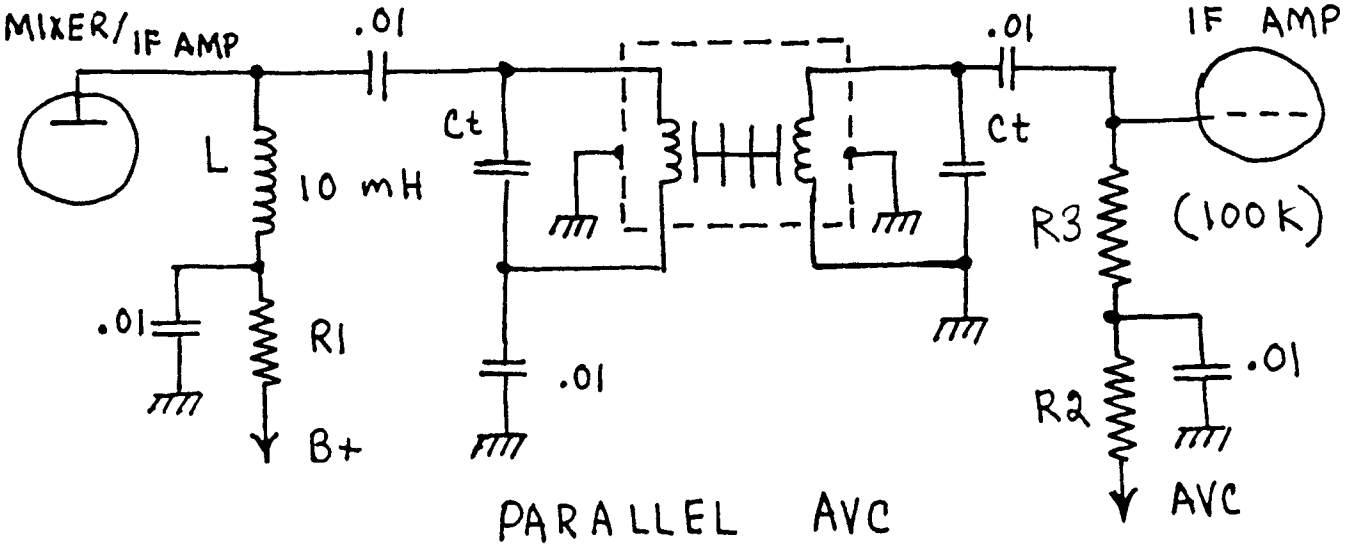


The FA, FB, and N series filters all have 3 lugs at the input and output. Apparently it does not matter which end of these filters is used as input or output. The filters can be connected for balanced or unbalanced operation at input or output.

There are two basic mechanical filter circuits, depending on whether AVC feed is series or parallel, which are shown below. L is an RFC choke of about 10 mH (the R-390A uses 12 mH), R1 is the usual B+ line resistor (2200 ohms in the R-390A), Ct are the terminating capacitors, including stray capacitance, which depend on the filter (130 pf for FA and FB filters, and 110 pf for N series filters), R2 is part of the AVC circuit (22K in the R-390A which uses parallel AVC, and 100 K in an HQ180(A) which uses series AVC), and R3 is part of the series AVC (100 K for an HQ-180A). The terminating capacitors Ct usually consist of a fixed mica in parallel with a 50 pf trimmer so that filter response can be optimized. In early R-390A's, only fixed 110 pf micas were used, while in later R-390A's fixed 82 pf micas in parallel with 50 pf trimmers were used for the 2, 4, and 8 khz bw filters, and a fixed 51 pf mica in parallel with a 50 pf trimmer was used for the 16 khz bw. Some other arrangements are also possible. Recently I encountered 8 and 16 khz bw filters made by Motorola (with a yellow label) which used no fixed mica, and which were tuned to resonance with only the 50 pf trimmers. I have used the FA series filters in one of my HQ-180A's with fixed 100 pf micas in parallel with 50 pf trimmers. All capacitors should be rated at least 500 VDC. The 0.01 mf filter input ground capacitor in the circuits below is my "fail-safe" mechanical filter protection mod. Together with the 0.01 coupling capacitor, it provides double protection of the filters from B+ voltage which would otherwise wipe out the filter input coil.



SERIES AVC



PARALLEL AVC

For current new prices (be prepared for a shock) and information on mechanical filters, write to Rockwell International, Electronic Devices Division, 4311 Jamboree Rd., P.O. Box C, Newport Beach, CA 92660. Refer to 526 part number only. Used and unused filters are occasionally available in the Ham Trader Yellow Sheets in the $20 - $50 range. A complete set of four N-series filters (plus a lot of other R-390A spare parts) can be obtained from Baytronics by buying their incomplete R-390A for $75 plus shipping (sans meters, PTO, and power supply). If you already have an R-390A, the filters can easily be checked by pulling the IF subchassis from the Baytronics unit, and putting it in your R-390A. The incomplete Baytronics unit represents a very good value for someone who wants several filters with a wide range of bandwidths. And for the adventurous, the R-390A switching could be reused to add multiple mechanical filters to another receiver. Or if one of your filters is weak (has excessive loss), you might want to trade it out. N-series filters are also sturdier than the others, and so are better suited for the experimenter.

PUBLISHER'S CORNER

Chris Hansen

Hi there, all you potential contributors!! Dallas is one of the best writers in the hobby today, and we've got him here, but he can't do it all alone. If we were to add one issue to the subscription of every contributor to the Spring 1986 issue, would you go to your (typewriters/legal pads/brown paper bags) and write something??? PLEASE! Seriously, we need your input to make HSN a bigger success than it already is. We await your contributions, and we will indeed add one issue to the subscription of EVERY contributor, whether we use it in the spring issue or keep it in the bank for later when we are DELUGED with articles. On another subject, yours truly is going to survey tube retailers for the next issue of HSN. We'll have our Second Sort-Of-Annual Gala Tube Issue at last!!! I'll try to get addresses, payment/refund policies, and sample prices for tubes we all need and want. Look for it! I am in need of the knob for the BFO Pitch control on my R390A and also the cable which goes from the IF stage to the IF Output jack (J116) on the rear pane. of the R390A. Name your price or I'll trade a set of two meters for your R390/R390A in mint condition with hardware. Two other pairs are for sale. Contact your publisher at the address on the front of the newsletter.

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FROM MY R390A MANUAL: Demolition of Material to Prevent Enemy Use: II, 172: Methods of Destruction: Use any or all of the methods listed in a through f below to make the equipment completely useless. a. Smash. Shash the controls, tuning mechanism, tubes,. . . b. Cut. Cut the power cord, the antenna lead in cable; use an axe, a handaxe, or a machete. c. Burn. Burn cords, cables, and manuals; use gasoline, kerosene, oil, flamethrowers, or incendiary grenades. d. Bend. Bend the panel, the cabinet, and the main frame. e. Explosives. If explosives are necessary, use firearms, grenades, or TNT. f. Disposal. Bury or scatter the destroyed parts in slit trenches or fox holes, or throw them into streams.

PLEASANT DREAMS FROM: Chris Hansen & the staff of Hollow State Newsletter!