THE HOLLOW STATE NEWS-LETTER

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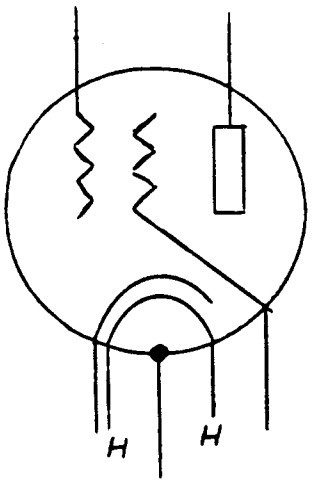
GREETINGS ONCE AGAIN, all you faithful followers of tube-type-tech. We are really becoming a tidy little group, with new members who are also addicted to the warm glow of fine old radios. But first, a word on the headline article from last issue. Many of you spotted the problem with this article. The capacitor in question on the R-390 IF subchassis is C-553, not C-533 as reported! The origin of this typo may just go all the way back to Uncle Sam, because, as your intrepid editor performed this small modification I referred to my Army manual (TM 11-5820-358-35), pages 68-69. If you have this manual you will note that Figure 41 has the C-553 capacitor mislabeled as C-533. C-533 is really off in the BFO circuit someplace. George Mulfinger thought it was an April Fool's joke, but many of our members picked up on the typo in addition to George. Our regular R-390 whiz DALLAS LANKFORD takes DICK NELSON's advice a step further. To begin with, Dallas suggests using a .01 1000v disc ceramic capacitor, although he notes that anything in the .01-.1 range with a voltage rating of 600v or better will do. Dallas goes on to note that there are actually two paths to ground -- one from one of the mechanical filters, and one from the ground of the trimmer caps. The ground from the mechanical filters was rerouted to the grounds of the trimmer caps, and the path from the trimmer caps to the chassis ground was replaced by one of the above-valued capacitors. The point of the modification as Dallas does it is that you now have two caps protecting the mechanical filters, so that if one cap shorts the other cap still protects the precious (and expensive) mechanical filter

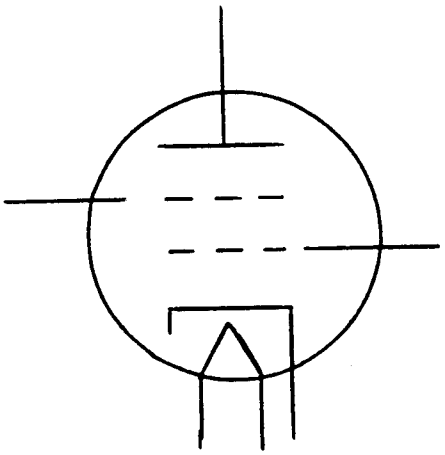
While on the subject of mechanical filters, the new (red cover #WS-84) Fair Radio Sales catalog lists "used-repairable mechanical filters" as well as new filters on page 27. I have never heard of repairing mechanical filters, so if any of our audience knows how to go about it, please send it along to HQ for the rest of us.

This Fair Radio Sales catalog is listing a special purchase of R-390As, used repairable $215 and checked $335. They also list the less-used but wonderful toy the R-392 for $135 used-repairable and $200 checked. You can get a copy of this catalog by writing to: P.O. Box 1105, 1016 East Eureka Street, Lima, OH 45802.

This episode of MEET THE TUBE concerns schematic symbols old and new. Deep in the bowels of your editor's mildewed collection live a number of circa-1940 RADIO magazines. You will note in the drawing an "old" way to draw tubes, and then the "new" more-conventional way. When I think over my rather meager understanding of tube theory, the "old" drawing



OLD WAY



NEW WAY

seems to look more descriptive to me. Anyone who might know the history of the evolution of the schematic symbols for tubes might share it with the troops.

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At a recent hamfest I ran across Joel Knoblock, the proprietor of R.F. Connection, which we plugged (no pun intended, I hope! ch) a few issues back. He was amazed at the number of curious inquiries on your part, and looks forward to meeting all your connector needs. He's still at: Suite 11, 213 North Frederick Ave., Gaithersburg, MD 20877.

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We have a new member who also has a business worth noting in our pages. Sue Coulter, 1000 West Columbus Ave., Space 11-A, Bakersfield, CA 93301. Sue runs Sue's Radio Repair; she specializes in pre-1950 radios. She also, along with some colleagues, has access to between 6,000 and 8,000 tubes. Sue sent us a rather amusing price list headed "Summer Cook Out -- Gourmet Menu." Some of the "dishes" of interest are: "Salsa Picante: 5Y4, 5W4, 81, 80, and 5Z3 or 5V4 ... all 5 for $5.50." "Zen. Tranny Heart: new 117Z6 or 117Z3 . . . $4.00" "Paella - 'yeech' 4 to 5 lbs. old boob-tube parts, many new in original boxes . . . $4.00." There are more, so a SASE to Sue will get you a copy of this list. Sue also says that she and her partners will make a bid on any list of needs a HSN member sends them, so make up your list of needs and send it, with a SASE of course, to Sue at the address above. Also available are large electrolytic caps and many schematics.

Do keep in mind that most of those who are willing to provide HSN members with information and merchandise would appreciate SASE's with any requests for reply.

From MARTIN STAHL comes this word on tube testers. Martin agrees up to a point with DALLAS Lankford's observation that tube testers are unreliable. Martin informs us that HICKOCK still manufactures very reliable tube testers. They have a lab model #539C, and a less expensive model #6000B. He notes that older models like the 600A and the 800 show up on the used market, and can be rigged to test almost any type tube by adding a CA-5 adapter still made by Hickock. The reason for their reliability is that they have a line voltage adjustment which establishes a standard reference voltage applied to the tube inder test regardless of variations in power line voltage. Also, the meter reading depends on a mutual conductance number measured in micromhos, which provides a more accurate gauge of tube status than the more traditional red-green face.

NEW MEMBER RICHARD DAVIS, 859 Helena Drive, Sunnyvale, CA 94087 is parting-out 6 R-390 receivers and 3 R-389 receivers. If anyone needs parts they should send a SASE with a list of needs. R-390A: no IF parts, some VFO, all RF, some audio and power-supply, knobs, meters, hardware. R-389: all "top-side" parts, some bottom side, knobs, meters, panel, and chassis.

REMEMBER TROOPS: THIS IS YOUR NEWSLETTER. IT IS THROUGH YOUR CONSTANT STREAM OF DATA THAT WE KEEP EVERYONE'S NEED FOR INFORMATION SATISFIED.

FOLLOWS AN ARTICLE ON R-390A/URR PTO ALIGNMENT BY DALLAS LANKFORD.

R-390A/URR PTO ALIGNMENT

Dallas Lankford

The purpose of these notes is to describe an alignment procedure to achieve almost exact end point alignment of the R-390A KILOCYCLE CHANGE (PTO tuning). This procedure is similar to the method described in NAVSHIPS 0967-063-2010, the navy maintenance manual published April 15, 1970, but is simpler because it avoids dropping the front panel. Thanks to Dick Truax for the crucial simplification, and for his general comments about PTO alignment which I have incorporated into the method below.

(1) PTO (VFO) Subchassis Removal WARNING!!!: Handle the PTO subchassis carefully to prevent damage or misalignment. To prevent misalignment, do not turn the PTO subchassis shaft or the KILOCYCLE CHANGE shaft (either outside or inside the front panel). To remove the PTO the R-390A is placed upside down. If the bottom dust cover is present, remove it. The PTO subchassis is in the center of the bottom three compartments. Locate the Oldham coupler and remove the anti-backlash spring, see Fig. 1 below. The Oldham coupler connects the PTO tuning shaft to the kilocycle change shaft. You will probably have to rotate the kilocycle change shaft with the front panel knob to bring the anti-backlash spring into a convenient position for removal. Do not loosen the spline socket head screws. To remove the spring I use a small hemostat which is ideal for delicate work like this. (Hemostats are also useful for soldering and unsoldering work, holding small parts, and other tasks, and are sold through several supply catalogs and at larger electronic supply stores. Or if you know a doctor or nurse, they will probably give you one or two free.) Put the spring in a safe place and do not lose it. Next rotate the kilocycle change knob until the Oldham coupler guide (the central disc) is in the position shown in Fig. 1 (when viewed from above). At this point, if you are the careless type, you should lock the KILOCYCLE CHANGE shaft with the front panel DIAL LOCK. Disconnect the blue plug P-109. (The metal cylindrical plug cover/lock mechanism rotates to unlock, and then the blue plug can be pulled out. If you cannot unplug P-109, examine the plug closely and make sure you have unlocked it.) Trace the white wire through the hole in the PTO compartment to the top side of the R-390A, unplug it from the RF subchassis (J 217), and pass it through the hole in the PTO compartment. Loosen the three green Phillips head screws completely, and carefully lift out the PTO subchassis. Because of the positioning of the Oldham coupler, and because you have locked the kilocycle change shaft, you must lift straight up. The coupler guide will probably fall free, but in any case remove the coupler guide and put it with the anti-backlash spring for safe keeping. PTO removal can also be accompkished with the R-390A on its side, but it is not as easy to replace the coupler guide in that position.

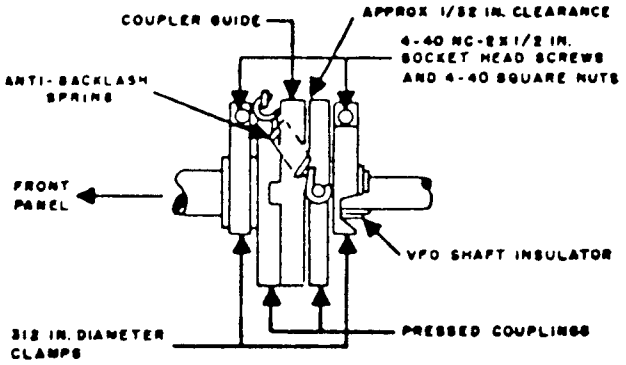

FIGURE 1

(2) PTO End Point Adjustment Cover Removal The location of the slotted ..ex nut which covers the end point adjustment control is shown in Fig. 2 below. Older PTO's may not look exactly like Fig. 2 (some do not have the same shaped cut-out holes which give access to the slotted hex nut through the front bracket of the PTO), but the position of the hex nut is the same in all models. With the appropriate size screw driver, remove the slotted hex nut, and place it with the anti-backlash spring and Oldham coupler guide.

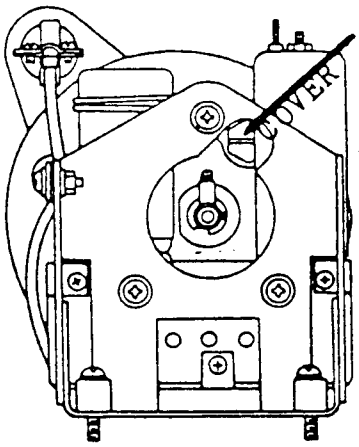

FIGURE 2

(3) PTO Subchassis Replacement Reverse the removal steps in step (1) above. Here if your PTO is a tight fit it may help to loosen (but do not remove) the two Phillips head screws that secure the triangular bracke towards the rear of the PTO compartment. But to tighten these two screws firmly after replacement of the PTO requires either a flexible shaft Phillips screw driver or an offset Phillips screw driver with appropriate head size. These two screws can be gotten reasonably tight with a straight blade Phillips screw driver angled past the flange of the triangular bracket, but do not use much pressure or you may strip the heads of the Phillips screws. Be careful when replacing the anti-backlash spring. A little grease on the Oldham coupler guide may help hold it in place during replacement of the PTO subchassis. Again, a hemostat is very helpful for spring replacement. Make sure the spring ends seat properly in the grooves of the spring posts in the Oldham coupler. A close inspection with a flash light is probably a good idea.

NOTE: If the above preliminary steps seem complicated, they are! PTO end point adjustment is not for the impatient or careless.

(4) Warm Up Turn on the R-390A and let it warm up for at least an hour. I do not normally use my crystal ovens, but if you do, remember to turn them on with the switch on the rear panel. In some cases, an hour may not be enough warm up time for an R-390A to stabalize. One of my R-390A's seems to require 2 - 3 hours for stabalization. If in doubt, wait longer than the recommended one hour minimum.

(5) 100 KHZ Calibrator Alignment Tune in WWV on one of its frequencies. Turn on BFO and adjust BFO PITCH to zero beat with WWV. Turn FUNCTION switch to CAL. A het with your 100 khz calibrator should be heard. With a small screw driver or metal blade alignment tool, adjust C 310 through the access hole in the rear panel for zero beat. Do not change BFO PITCH setting from the above setting.

(6) End Point Adjustment With FUNCTION switch set to CAL and BFO on (and at the same BFO PITCH position as in step (5)), set KILOCYCLE dial to +000 (a het of the BFO with the 100 khz calibrator should be heard), tighten the ZERO ADJ. knob, zero beat by turning the KILOCYCLE CHANGE knob, and release the ZERO ADJ. knob. Set the KILOCYCLE dial to 000 (the low end of the 1000 khz range). Again a het of the BFO with calibrator should be heard. Now comes the tricky part. Cut a plastic handled metal blade tipped alignment tool (Radio Shack 64-2223 or equivalent) to 3 3/16 inches long, see Fig. 3 below. The maintenance manual recommends using a non-metalic alignment tool, but I experienced no problems with my plastic handled metal tipped home-brewed tool. Slip the alignment tool through the holes in the RF subchassis front plate and PTO front bracket, and engage the end point adjustment control (slug). Good lighting is essential at first until you learn the "feel" of proper engagement. I used a flash light to visually verify that my alignment tool properly engages the end point adjustment slug. You should also be sure that your tool does not damage the threads which accept the end point cover nut. Some end point slugs can be turned by hand, but mine was stiff, so I used needle nose pliers to rotate my alignment tool. About 3/4 inches of the plastic handle protruded past the front plate of the RF

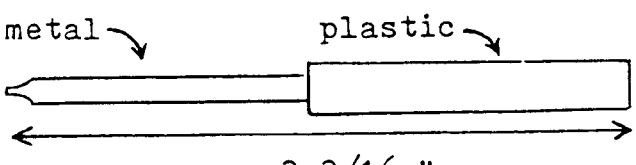

FIGURE 3

subchassis near the ten turn KILOCYCLE shaft stops for a good grip with the needle nose pliers. In any case, turn the alignment tool (either clockwise anti-clockwise) until zero beat is obtained. My PTO was about 2 khz off at the end points, and this initial adjustment required about ½ turn. Next tune back to +000 (the other end of the 1000 khz range). Again, a het should be heard. Zero beat as before, using the ZERO ADJ. knob and KILOCYCLE CHANGE knobs. Tune back to 000 and zero beat with the end point slug again. Alternately repeat the +000 and 000 adjustments until no improvement is obtained. After 5 or 6 passes, you should be within 50 hz or less. WARNING: Do not reverse the +000 and 000 steps during this procedure.

(7) PTO End Point Adjustment Cover Replacement Remove PTO subchassis as in step (1). Replace slotted hex head nut (refer to step (2)).

(8) PTO Subchassis Replacement Refer to step (3). NOTE: Before replacing the PTO subchassis for the final time, inspect the Oldham coupler, and clean and re-lubricate if necessary. I often use 3-in-1 oil, but you may want to use a heavier lubricant. I have also used a good quality bicycle bearing grease before with excellent results.

REMARKS: My first (and, until now, only) PTO alignment was done on a unit which was about 2 khz off (1000 khz actual = 1002 dial reading). End point calibration was achieved with about ½ rotation of the end point slug after 5 or 6 alternations of the +000 and 000 adjustments. Neither of the two PTO's I have experience with (one aligned by Dick Truax, and the other by me) are exactly linear throughout the 1000 khz range even though the two end points in both cases are almost exactly 1000 khz apart. After a thorough warm up, the R-390A I bought from Dick is as much as 200 hz off at 100 khz calibration points between the end points, while my other R-390A is as much as 400 hz off. Such departures from linearity are common, and the maintenance manuals specify that linearity should be better than 300 hz when calibrated at the nearest 100 khz calibration point. In both of my R-390A's, linearity is probably within 50 hz when calibrated at the nearest 100 khz point. In the PTO that I aligned, zero beat at 000 was obtained by rotating the end point adjustment slug clockwise (when viewed from the front). I would like to express my appreciation to Dick Truax for his patient explanations and discussions of PTO alignment. Without his advice and discussions, these notes would not have been possible.

(The preceding article was originally published in the National Radio Club's "DX News," and is reprinted with permission of the author. ed)

ADDENDUM: Check the PTO tube before alignment, and replace, if necessary, before alignment. I learned this lesson the hard way by replacing the tube and tube shield after end point alignment, and then learned to my dismay that the change brought the PTO about 700 hz out of alignment.

REMEMBER, DEAR READER, how last issue we asked the musical question: just what do those "WA" numbers mean??? Your editor received many variations on essentially the same theme, perhaps best described by SUE COULTER. "Increasing use of radio in mobile installations showed a definite need for more rugged internal tube elements were manufactured of heavier or more rugged material. Some were specially treated in order to withstand greater overloads. These tubes were termed 'ruggedized,' and the letter "W" was added as a suffix." Many JAN Mini-tubes have "WA", which stands for sturdy construction with quick-heating filaments. There, another mystery solved through your newsletter.

NEW MEMBER SCOTT FABRIS, 3626 Morrie Drive, San Jose, CA 95127 needs copies of pages 16, 17, 28-36, 114, 126 of Air Force Manual TO 31R1-2URR-442, and wishes to sell a Scott military receiver, and wants to buy a prewar Scott. Write to Scott for details.

SKIP WESTRICH sent me a copy of the February 1971 issue of QST, and in it was an article that almost made your editor cry. It involves an account of the activities of Ralph McClintock K1SCQ on the afternoon of January 23, 1968. Ralph was stationed on board the U.S.S. Pueblo when the North Koreans captured it. The article recounts how his shipmates and he had to take sledgehammers and fire axes to the ship's R-390A's and all of its other "juicy" equipment. I am sure many of you have that field operations manual that describes how best to destroy your rig in time of emergency. Very very chilling thought. I am glad my rig is decommissioned because I don't think I'd have the heart.

AT THE REQUEST OF THE SHARP-EYED PUBLISHER, who tired of your editor's childlike scrawl of schematics, I went in search of the ideal draftsman's template for use in our journal. Very few are still around that have cutouts for tube work, but one nice one some of our members might like to purchase for their own use or for submitting schematics (although it is by no means necessary because your editor has a tolerant eye) is the RAPIDESIGN #316 Missile and Space Electronics Template. Wow! Even the title conjures up images of old 1950's sci-fi movies. With template in hand future issues should have much improved schematics to match our better printing process.

JUST A SHORT NOTE TO once again thank all of the contributors in all of the past issues. I recently took a few days vacation and did a major teardown of my R-390 and performed no less than seven modifications, adjustments, and improvements, all made possible by our contributors. At this point it looks like I will have another half-dozen or so by my next maintenance session. Remember to keep articles about all types of tube receivers coming in to Editor's Central -- we need articles on other receivers than the R-390. Any of you Hammarlund or Hallicrafters buffs out there have something to offer? Please send it in posthaste!!!

PUBLISHER'S CORNER: Please take a moment now to check the mailing label on the envelope your HSN arrived in. If there are any typos, please tear out the label, correct the typo, and mail it to Publisher's Central (P.O. Box 1226, New York, NY 10159). I am going back to the stone age -- xeroxed mailing labels instead of computer printed labels. Oh well. Members will note that the foreign rates have changed -- doubled, in fact. HSN is still a great buy at twice the price -- this proves it (hi!). HSN has no advertising policy -- we do not take fees for printing information about suppliers. We would appreciate it if the members would contact us and recount the results of their contacts with suppliers mentioned in these pages. A STORY: When I first bought my R390, five years ago, it had no meters (like most R390's obtained from the government). I was shocked to find that a well-known supplier in New Jersey wanted $70 for the pair of meters I needed. When asked why the price was so high this source stated that inflation was rampant, didn't I know? Well, I was resigned to being meterless when my eye fell on a catalog of McGee Electronics in St. Louis. They were advertising military-type meters, both audio level and signal level meters! I immediately sent away and bought 10 of each, because the prices were $1.79 and 1.19 respectively! So much for inflation.

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THE NEXT PUBLISHING DATE IS SEPTEMBER. GET YOUR ARTICLES IN EARLY. YOUR CONTRIBUTIONS OF MATERIAL MAKE THIS NEWSLETTER POSSIBLE.