

# **Radio Boulevard**

## **Western Historic Radio Museum**

### **Pseudo R-725**

No,...Pseudo wasn't a company,...it means false or fake. I call this R-390A a Pseudo R-725 because it really is a creation that resulted from an accidental find among a pile of R-390A parts that I bought.

I had received an e-mail from a collector friend of mine asking if I'd be interested in all of his R-390A parts. There was a main frame with most of the modules, another RF deck, an Audio deck, PS deck, PTO and a front panel, all for \$100. It sounded like a good deal so I went over and picked them up. When I got the parts home and closely inspected them I discovered that the main frame had a Series 500 IF deck installed. The Series 500s were built by Arvin for the R-725.

Essentially, the Series 500 IF deck is just like the IF deck used in the R-390. Six stages of IF amplification and no mechanical filters. The original R-390 IF deck used BNC connectors for input and output but the R-390A used BNC Junior connectors. The Series 500 changed the connectors to match the R-390A and also performed any other changes necessary to make the Series 500 just a "drop in" conversion.

I used my 1967 EAC SN 974 R-390A because this receiver had recently been partially "cannibalized" to complete another EAC R-390A. I needed to check out the PTO, replace a defective RF transformer on the 2-4mc antenna stage and do some minor alignments. Luckily, one the "parts" RF decks supplied a good RF transformer. Once I had SN 974 back to working correctly, I went on to the Series 500 IF deck.

I cleaned this module first. One of the IF transformer cans was severely dented and needed "body work" to correct. All of the tubes were missing. I checked over the underneath and all components appeared to be in good shape. I gave the Band Width switch a DeOxit treatment. I needed tubes and tube shields. I found all of the tubes in my tube storage. The shields were "borrowed" from

The Pseudo R-725 built from a 1967 EAC R-390A SN: 974 with the installation of an Arvin Series 500 IF deck. Note how the input and output coaxial cables connect to the mounting bracket for the Meter and IF Gain potentiometers. Also, note that the rear panel IF output is directly behind a 12AU7 tube that prevents the installation of the coaxial cable. Also, note that the Amphenol power connector is turned 90 degrees from the standard R-390A IF deck.

The Series 500 is a "tight fit" but it does fit. The chassis is somewhat longer so the captive screws are located on the chassis rather than on the flange. The Band Width and BFO shafts are shorter than on the standard IF deck. The input and output coax connectors are in a different location but the cables reach easily. There is no clearance for the rear IF output cable as it is directly behind one of the 12AU7 tubes. I just left it off (the parts set even had the rear

IF output connector totally removed.) The Amphenol connector has to be turned 90 degrees but everything lines up and there is ample flexibility to allow for this connection.

With power applied, everything came up as expected. The first thing noticed was that the IF Gain must have been at "maximum" - it was. After some testing and listening, I reduced the IF gain by about 30 percent. This provided ample IF gain and much lower noise levels. Carrier Level was adjusted on 15mc to zero with the antenna disconnected. BFO was zeroed. I didn't do a 455kc IF alignment because the IF deck already seemed to be performing as expected. Also, most of the time when doing the IF alignments in R-390As, the IF alignment is usually very close anyway. Maybe later.

I was ready to listen to see why the R-725 was created. Obviously a major gain improvement. Now, I like mechanical filters, so I'm not going to say that the audio was so much better. Yes, it sounds like a R-390 but with more gain. The origin of the R-725 was for direction finders that used four receivers per installation. Apparently, the mechanical filters resulted in signal path phase shifts that caused errors due to the elaborate method used for DFing. Generally, four antennas were used and low frequency modulation added via a goniometer to detect actual direction. The MF phase shift interfered with the low frequency modulation and thus the accuracy of the DF. Early versions of this DF set-up had used R-390 receivers but the R-390 had been out of production for several years, so the solution was to build new, slightly modified, R-390 IF decks (and call them Series 500.) These were installed into R-390A receivers and then "tagged" as R-725. The tags show either Arvin or Servo as the contractor.

The PTO may have had a special steel shield installed also. The spare PTO I got with the "parts purchase" probably came out of the R-725 and it is a Cosmos PTO with a "slip on" steel shield. Probably to prevent magnetic interference. Another interesting feature of the R-725 PTO is that it won't function in a standard R-390A. This is because the PTO tube heater-chassis connection (pin 3) is brought out of the PTO via pin C of the power connector. Pin C was unused in the standard PTO but apparently, in the R-725, there was some external function that required this connection. Also, since the PTO tube heater is in series with the BFO tube heater and the 3TF7 ballast tube, any external function will also affect these tubes.

I'm using the Pseudo R-725 as a station receiver paired with an ART-13A transmitter. So far, most 75M AM signals are pushing the Carrier Level meter over 70db on the scale. Most SW BC signals are at 50db but Radio Havana can push the meter to 90db sometimes. Tune off of Radio Havana and the meter drops to nearly zero. Amazing. Lots of gain available. On SSB, the RF Gain is usually set to about 5 with the Local Gain at 7. Even though my R-725 is a fake, it's a very nice performer and, actually the IF deck is a real Arvin Series 500, so I guess it's not too much of a fake after all.

## **Other R-390 and R390A Versions**

R-725 - This version, an end-user conversion, replaced the standard IF module of the R-390A with an IF module similar to that used in the R-390. This provided the user six IF stages and eliminated the use of mechanical filters. The R-725 IF modules (identified as Type 500) were new-builds, not converted old R-390 IF modules. Since the modules were slightly longer than the R-390A IF module, the captive screws are located on the chassis rather than on the chassis flange (and there is no chassis flange.) The three coax connectors are compatible with the R-390A coax cables but are in different locations on the module. The IF input and IF output are located on a sheet metal piece that also has the Carrier Meter pot

and the IF Gain pot. The rear panel IF out is located near the rear of the chassis. The R-390 IF module and coax cables used different connectors in these application. The Amphinol connector is rotated 90 degrees but is in the same general location. Arvin built the Type 500 IF module that I have. These IF modules could be installed into any R-390A. However, the PTO used in the R-725 will only work in an R-725 version since the PTO tube heater chassis return is external to the PTO. The R-725 PTO also has a steel shield over the case to prevent magnetic interference. Original conversion R-725 receivers will have data plates installed that show they are R-725 and not R-390A. The end-use for the R-725 was as a component receiver of a direction-finding installation that required four receivers per set-up. The phase-shift caused by the standard R-390A mechanical filters interfered with the DF process that measured the phase-difference of the signal on a four vertical antennae "square" to ascertain true direction. The original DF design (and early versions of it) used R-390 receivers.

Bron: <http://www.radioblvd.com/R-390A%20Rebuild.htm>

R-725 - Deze versie, een eindgebruikers convertering, heeft de standaard IF-module van de R-390A vervangen door een IF-module die vergelijkbaar is met die van de R-390. Dit zorgde ervoor dat de gebruiker zes IF-fasen en het gebruik van mechanische filters elimineerde. De R-725 IF-modules (geïdentificeerd als Type 500) waren nieuwbouw, niet omgezet in oude R-390 IF-modules. Aangezien de modules iets langer waren dan de R-390A IF-module, zijn de gevangen schroeven in plaats van op de chassisflens (en er is geen chassisflens). De drie coax-aansluitingen zijn compatibel met de R-390A coaxkabels maar zijn op verschillende locaties op de module. De IF-ingang en de IF-uitgang bevinden zich op een plaatmetaalstuk dat ook de Carrier Meter pot en de IF Gain pot heeft. Het achterpaneel IF uit ligt vlakbij de achterkant van het chassis. De R-390 IF-module en coaxkabels gebruikten verschillende aansluitingen in deze applicatie. De Amphinol-connector wordt 90 graden gedraaid, maar ligt op dezelfde algemene locatie. Arvin bouwde de Type 500 IF module die ik heb. Deze IF-modules kunnen in elke R-390A geïnstalleerd worden. De PTO die in de R-725 wordt gebruikt, werkt echter alleen in een R-725-versie, aangezien het chassisrendement van de PTO-buisverwarming extern is aan de PTO. De R-725 PTO heeft ook een stalen schild over de behuizing om magnetische storing te voorkomen. Originele conversie R-725 ontvangers hebben data platen geïnstalleerd die aantonen dat ze R-725 en niet R-390A zijn. Het eindgebruik voor de R-725 was als component ontvanger van een richtingzoekende installatie die vier ontvangers per set-up nodig had. De faseverschuiving veroorzaakt door de standaard R-390A mechanische filters stoorde het DF-proces dat het faseverschil van het signaal op een vier verticale antenne "vierkant" gemeten had om de ware richting te bepalen. Het originele DF-ontwerp (en vroege versies daarvan) gebruikte R-390-ontvangers.