

RADIO ROOM 4  
MAINTENANCE/RESTORATION

LOG

1993 to 2004

Compiled by: Jerry Proc

### **APRIL 9/93**

- Constructed one 8" speaker in anticipation of acquiring an SP600 in Radio 4.

### **JUNE 16/93**

- Acquired Wilcox-Gay reel to reel tape recorder from Bill Scott VE3CUP.

### **JUNE 19/93**

- Acquired Hammarlund SP600 S/N 1170 receiver from John Turgoose VE3NFK.

### **JULY 3/93**

- Finished scraping dead paint in preparation for re-paint of Radio 4.

### **JULY 9/93**

Checked out Wilcox Gay tape recorder, Model 772 S/N 2852.

Notice excessive hum from power supply. Installed two additional electrolytics to bypass defective sections of existing power supply electrolytic. Hum has disappeared but further testing reveals a number of other problems:

- Output transformer snaps at random. Suspect intermittent short.
- Sound is very distorted. Unit sounds like a diesel tractor instead of a watch.

Removed Wilcox-Gay logo but left letter W. Attempting to masquerade it as a Webcor unit. Ready for installation.

### **JULY 10/93**

- Built anti-climbing device for the ladder to Radio 4.
- Ceiling and walls in Radio 4 have been re-painted. Final coats of paint applied July 15.

### **JULY 23/93**

Repaired Hammarlund Super Pro 600J S/N 1170. Now ready for installation in Radio 4.

Symptom: No reception - just audio hum.

\*\*\* NOTE: THIS RECEIVER HAS HAD MASSIVE MODIFICATIONS \*\*\*

- \* Manual supplied was for Model 600JX instead of 600J.
- \* Cleaned receiver up as best as possible.
- \* Resoldered one unconnected end on capacitor C150.
- \* Removed unconnected PCB above the BFO tube V13. Did not disturb unofficial toggle switch and rotary switch in upper right corner of front panel. This looks like an abandoned modification.
- \* Removed unconnected IF connector on rear chassis. In its place, a binding post for chassis ground was installed.
- \* Fabricated metal bracket for balanced antenna input connector in vicinity of V1. Connected antenna input connector to unused PHONO input strip on rear of chassis. Now antenna can be conveniently connected at chassis rear, however, the antenna must be 100 ohms balanced.
- \* Tested all tubes. V14 (6J4) shows as leaky, however, chassis stamp indicated that V14 should be 6AL5. Replaced 6J4 with good tube. Assume that this is part of some modification. V19 (5R4) and V20 (6AL5) tubes are missing and have been replaced with solid state diodes. All other tubes test OK.
- \* Discovered that the root cause of "no reception" was the band change mechanism. It was causing the "band L-C drum" to detent to the wrong physical position thus preventing the various L-C combinations from coming into contact with the stationary chassis contacts. Re-adjusted heart shaped cam on bandswitch mechanism for proper operation.
- \* Noticed that the selectivity switch only allowed operation in the 1.3 NON-XTAL position. Sprayed entire switch assembly with tuner cleaner to restore full operation.
- \* Notice that there is excessive audio hum. Found 12AX7 plugged into V16 socket. Replaced this type with original 12AU7 type and the hum diminished.
- \* Continued to trouble shoot audio hum problem. Discovered that the power supply has been drastically altered. Solid state diodes were installed to replace tubes V19 and V20. There is now a choke input filter instead of capacitor input dual section filter. One of the chokes is missing and was replaced with an array of 330 ohm 2W resistors to form an equivalent 165 ohm 8 watt resistor. The hum goes away when any low value capacitor is added to the Pi filter but the output voltage of the supply goes up from 280 to 340 volts. Tried to reinstall V19 (5R4) and recreate the original supply but get the same results as with solid state diodes. Restored solid state power supply. Added .2 uf 400 Volt foil capacitor to input of filter. Now hum is gone.

\* Found 60 uf capacitor on load side of choke input filter. Someone had joined three 20 uf sections in parallel. Cut jumpers and only left a 20 uf section in place.

\* While evaluating the receiver, heard a sparking sound then smoke followed. Found that C123 (.022 uf) inside IF transformer T5 had shorted to ground thus causing R54 (2.2K 1/2 W) to fry. Replaced both components. While C123 was shorted, the overloaded power supply damaged the 300 ohm resistor array that was replacing one of the choke coils. Replaced the array with 300 ohm 75 watt equivalent resistor (three 100 ohm, 25 watt resistors in series). Now receiver works OK.

\* Performed alignment on IF stages but could not go further as the chassis is devoid of adjustable component markings and the manual calls for components that cannot be located.

\* Checked out the whole receiver. Find shortcomings in the following areas:

- The meter does not work at all in the audio position. It indicates some reading in the AGC position but it does not respond to signal strength.

- Flipping the MOD/CW to the CW position causes a one time pinging sound. The sensitivity of the receiver appears to be impaired in CW mode. Likely caused by modifications.

- The AVC function does not appear to be evident. Not sure if receiver has AVC.

- Main dial is out of calibration.

\* Installed re-finished RCN shock mounts on chassis.

## **AUGUST 1/93**

- Installed the following equipment in Radio 4:

- SP600 Receiver
- Reel to Reel Recorder (Wilcox-Gay Recordio)
- FMB Direction Finding Receiver
- Speaker for SP600

Need to install antenna and speaker wiring for SP600.

## **AUGUST 7/93**

- Connected speaker to SP600. Installed wire between receiver chassis and ships ground.

- Connected 5 foot wire to SP600 antenna terminal. Receiver works OK, but reception is degraded because Radio 4 is acting as a good shield.

### **AUGUST 14/93**

- Installed two equipment cradles.

### **AUGUST 21/93**

- Refinished and installed UMB blocks for FM12.

- Refinished 120 to 240 step up transformer for FM12 but did not connect it to a power source at this time.

### **SEPT 17/93**

- Connected telephone to respective line. Unable to communicate on party line.

### **OCT 9/93**

- Refinished and installed AID speaker.

### **NOV /93**

Received one SP600 JL-16 S/N 6827 receiver from Tom Brent, Box 150, Dewdney B.C.  
V0M 1H0

### **MAY 19/94**

SP600 JL-16 S/N 6827

Inspected unit and find the following conditions exist:

- 1) objectionable hum on audio signal.
- 2) still hear audio after volume control set for minimum.
- 3) unit goes into audio oscillation intermittently.
- 4) crystal oscillator is not working.

#### Fix for problems 1 & 2

Discovered someone had installed 12AX7 instead of 12AU7 in V17 (1st audio) socket. Replaced with 12AU7 and this corrected the hum condition. Found that any 12AX7 generates hum if used in this circuit.

### Fix for problem 3

Discovered strands of shielding on coax shorting out cathode resistor R83 in 1st audio stage V17. It looks like the 1st audio has been modified at some point in time.

### Fix for problem 4

Reconnected broken wire to feed through on upper front of RF deck.

### **SEPT 3/94**

For the record, the door markers as viewed from the interior are:

Blue - upper left hand corner - matches outside marker.

Org - upper right hand corner.

### **JUNE 3/95**

Wired up RCU#14. Did not work. Discovered that a six foot section of cable is missing above the main galley.

### **MAY 19/96**

Received the following donation from: Tom Brent, P.O. Box 150 Dewdney, BC V0M 1H0

UPD501 Power Supply S/N 464; RCN Stock #4031006 . Made by Cossor Canada.

Installed two missing fuseholders above P602. Inside of unit has been stripped of the power transformer, filter choke and filter capacitors.

### CONNECTORS MOUNTED ON CHASSIS

P601 (Male) #18-12; 6 small pins

P602 (Female) #28-2 ; 2 large receptacles; 13 small receptacles.

P604 (Female) #16-9 ; 2 large receptacles; 2 small receptacles.

### **JUN 8/96**

-Spliced two pieces of coax from loop antenna to the FM12 antenna junction boxes.

- Wired up FM12 step up power transformer but discovered the power source is dead. Traced cable back to SPS6C compartment and find the power source is non-existent because the power transformer has been removed. Need to jumper some power to FM12.

## **JUN 16/96**

- Removed Super Pro 600J S/N 1170 and replaced it with SP600 S/N 969 (R274/FRR Order #3376-PHILA-52). The internal nameplate says 'SP600 JL16 S/N 6827'.
- Installed UPD501 power supply and existing cabling.
- Removed Wilcox-Gay tape recorder and replaced it with a working Webcor unit Model 2110 S/N 10537. New tape recorder was supplied by Frank Moore. There is no reference to the correct model number that was fitted.

## **JUN 22/96**

- Tested loop antenna for FM12. One of the loops is open.
- Installed cooling fan on forward bulkhead.
- Tested RCU#14 after cable was respliced by Jim Brewer - works OK.

## **FM12**

- Applied power. Frequency band lamp comes on but unit is dead.
- Replaced one defective 1 amp Fast blow fuse - no change.
- Notice that sense output control shaft is very loose. Removed sense valve compartment but could not get to the affected component due to bad serviceability. Restored compartment.
- Tested tubes. Found 6K7 plugged into socket #3 instead of 6K8.  
Replaced with 6K8 glass type. No change.
- Found weak NR64 (6J7) at socket #2. Replaced tube - no change.
- Notice that there is no anode current for the RF1 and RF2 stages. Discover bent contact springs which engage with the coil drum on RF2 section. Contact springs reformed. FM12 now works.

## **JUL 2/96**

FM12 - There is slight distortion in the sound. May be caused by tube substitutions (ie NR64 replaced with 6J7)

- Installed second voice powered phone.

## **AUG 23/96**

Inspected the loop antenna for the FM12. Found out that the F/A loop antenna was not fastened to the terminal screw on one side. The rubber insulation on the loop coils is extremely deteriorated, so disturbances were held to a minimum. Reconnected the joint successfully, however, the loop resistance is not less than one ohm as compared with the good P/S loop. The resistance can vary between 4 to 10 k ohms depending on when it was measured.

Additional troubleshooting reveals that the coax cable for the F/A loop is open somewhere between Radio 4 and the junction box.

**AUG 30/96**

- Installed UPD 501 S/N 129. Unit is missing many internal components and is not operational at this time.

**AUG/98**

Installed functional UPD501. Antenna is missing at this time.

**APRIL 12/04**

Completed assembly of AN/SRC501 mockup (S/N 07020) and installed it in Radio 4.