

## History of Naval Ships Wireless Systems IV

### Post WWII RCA and Murphy Equipment

This section covers the 89 Transmitter, the B40/41/62B series and 618 complete. These pieces of communications equipment were part of the interim fit prior to ICS with the Murphy Transmitters and receivers also being part of the COMIST suite (Communications in the Short Term).

The Type 89 transmitter came with three modifications:

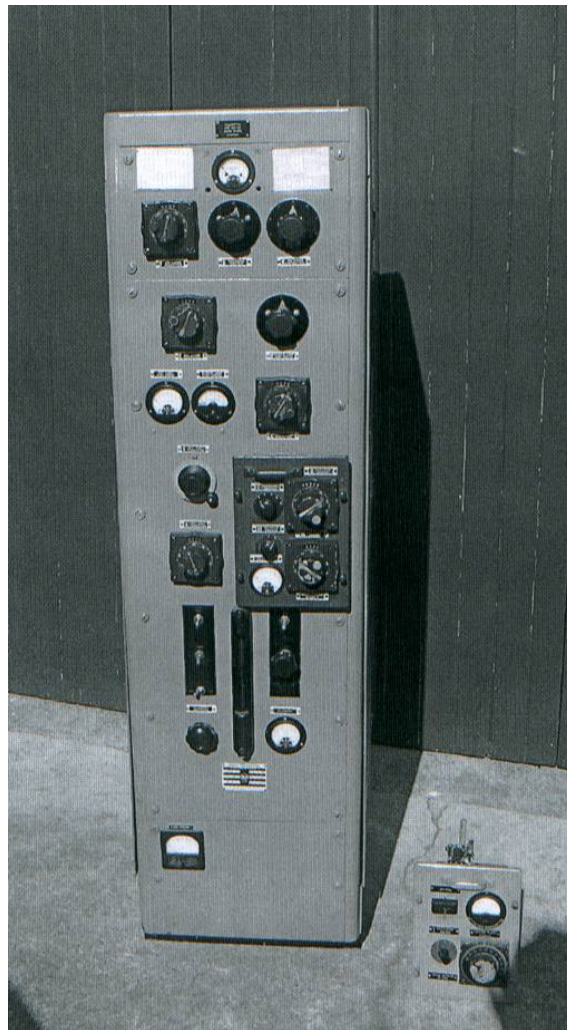
89 – original set – crystal operation only

89M – first modification – variable frequency oscillator added (VFO)

89P – second modification – had a crystal unit but able to be taken out and replaced by a VFO.

89Q – third modification – as above but an additional control unit, Design 8, allowed the transmitter to be used with the KH series control systems.

The Type 89 was built by RCA Victor and known in the US as the ET4336H and in the NZ Post Office as the Type 351 HF.



## Type 89Q

1.5 - 20 Mhz.

VFO or Crystal Oscillator. The crystal oscillator and master oscillator are separate units, one of which must be plugged into the front of the transmitter depending on the type of frequency determination required. See picture above.

CW 350 Watts

Voice 250 Watts

FST with GK185A keyer 250 Watts

Interesting note regarding the Type 89 transmitters – Operators on the Loch Class, Lachlan, Endeavour I and the Bathurst Class have reported the transmitters “arcing” in the offices on occasions during transmission. The side panels were easy to remove revealing enough space inside the transmitter to hoard cans of beer. Extra metal inside the cabinet certainly wouldn’t have helped!

However, other reasons may have been behind the cause of RF radiation within the Office. Prior to the introduction of coaxial cable and aerial matching units at the base of an aerial, all aerial matching was done at the transmitter and the RF fed through a trunk outfit between the transmitter and the aerial. From the top of the transmitter to a deck insulator in the deckhead or bulkhead, the aerial feed was a single, bare wire. Earthing was provided by strapping the transmitter to the bare metal deck. The conductor from the transmitter to the aerial was supported in the trunk by means of stand-off insulators, and the aerial was connected to a deck insulator at the top of the trunk. The size of the trunk depended upon the power output. All transmitters in RNZN ships, including the 600 series prior to the 640, fed into a trunking system. The full length of the aerial plus the whole of the trunking run, was tuned to have an electrical length of a quarter-wave length at the frequency being used. This system was extremely inefficient in that only a short length of the aerial produced radiation outside the ship. The trunking radiated with the energy supposedly remaining within it.

RF radiation or “arcing” may have been caused by the following:

1. A stand-off insulator coming loose or breaking off inside the trunking, causing RF back down the line into the office.
2. Soot or salt build-up on the aerial, changing tuning points and resulting in a mismatch. Arcing is a form of RF radiation normally caused by a breakdown in a component or tuning into some part of an aerial whose physical characteristics have changed. For example – on **Taranaki** in 1970, the porcelain insulator above the Base Tuner of the Port whip, had a crack in it. Every time the transmitter was keyed, a blue arc materialised through the crack and formed a connection with the guardrail some metres away. The crack had resulted because of a buildup of salt spray on the insulator.

Similarly, trying to tune into an aerial that has corroded through soot or salt buildup can cause high voltages to occur across the plates of the tuning capacitor. This results in unwanted RF energy seeking another path and in some cases has been known to arc from the Type 89 across to the nearest receiver.

3. Dirty Tuning Coil.
4. Large VSWRs existed on the feeder and increased losses were present. There were no VSWR meters to see if the aerial was close to being matched or how much reflected power was present.

### **Murphy Radio Receivers**

The B40 series were designed to replace receiver B28. There were four models:

Main differences as follows:

B40A – had no AGC switch and no window showing the frequency range in use and not capable of FSK.

B40B – no facility for common aerial working and therefore no aerial change-over switch. Not capable of FSK.

B40C – no Oscillator Trim Control and not capable of FSK operation.

B40D – has all the above. Capable of FSK and SSB operation when used with Receiver Adaptor Outfit FAZ. CW/AM/FSK/SSB

B40D 650 kHz – 30 MHz. A superheterodyne receiver consisting of three basic units – RF, IF and AF and Power. When fitted for Common Aerial Working it was known as Outfit CAY and when not fitted – Outfit CDW.



B40/B41/B62-B  
Similar in appearance

## **B41**

15 kHz – 700 kHz. A superheterodyne receiver consisting of three basic units – RF, IF and AF and Power. When fitted for Common Aerial Working it was known as Outfit CAZ and when not fitted – Outfit CDY.

CW/AM/FSK

Three models A, B and C

B41A – Different bandwidth switches to the B41B and C.

B41B – Not fitted with valves that had been agreed to by Joint Services.

B41C – Had the correct valves as agreed by Joint Services. Capable of FSK when used with Outfit FAZ.

## **B62-B**

150 kHz – 30.5 MHz. CW/AM/FSK

Never seen this used in the RNZN other than for the Sound Reproduction Equipment (SRE) compartment. Used mainly for reception of medium-wave and short-wave broadcast stations for piping through a ship's main broadcast system to keep the crew entertained with music and news.

## **Type 618**

The Type 618 was designed in 1953 by Murphy but distribution throughout the Fleet was sometime between the mid to late 1950's. Secondary/emergency transmitter/receiver outfit in frigates and above and the main set in smaller craft. A general purpose low power transmitter fitted in all classes of ships to replace Types TCS, 607E, 608E and 60EQR.

The complete 618 consists of:

1. Power Supply (weight 135lb) - provides the necessary HT, filament, bias and control voltages for the operation of the receiver and **either the HF transmitter or the MF transmitter (but not together)**. On the front panel is the Mains Switch, the Stage Switch (Receiver, Standby and Trans Ready – this provided the necessary voltages to the different stages), Indicator Lamp (fuses), Local/Remote Switch, Microphone Socket and Key Jack.
2. HF Transmitter (618H) 1.5-30Mhz, CW/MCW/AM, 40W (weight 70lb) – frequency determination VFO or Crystal Oscillator. The VFO was not that stable and tended to drift, so each ship carried the requisite number of crystals





618L on top, 618H in the middle and CAS receiver on the bottom. Power supply normally sat on the deck underneath the bench.