DGAC HF Voice/RTTY system—failure of receiver multicoupler

SERVICE BULLETIN

Introduction

The DGAC HF Voice system in Antarctica, documented in system drawing 03–00987 Issue B, is comprised of three specific high power (1 kW) transceiver systems. Receive audio for each system is derived from a common receive antenna and supplied to each transceiver system via a 12 port active multicoupler. The coaxial line is switched for transmit/receive (Tx/Rx) purposes via a coaxial relay in each transceiver cabinet.

A problem can occur if transient RF energy is present at the normally open (NO) connector of the coaxial relay during Tx/Rx switching. This RF energy can damage the amplifiers in the active multicoupler.

The timing with which the RF energy is presented at the RF output port of the transceiver in response to a PTT input request, and the timing of the external PTT signal used to switch the coaxial relay, are controlled by the internal software of the transceiver. The timing of these events within the transceiver software is complex. Making changes to this software for a DGAC specific application may cause problems elsewhere. Modifying the hardware inside the transceiver is undesirable as the transceiver will then become unique and not be readily interchangeable.

Symptom

No received audio at the console.

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Preventative action

To control the magnitude of transient RF energy at the connector of the coaxial relay:

❑ Insert an RF clamp assembly (part number 08–05656–001) in the coaxial line at the coaxial relay of each transceiver system (see Figure 1).

The RF clamp limits the magnitude of transient RF energy to approximately 4 V, which will prevent any damage to the receiver multicoupler.

The units have been fitted with coaxial N–N type adaptors so the RF clamp can be directly connected to the coaxial relay. The 12 V DC and 0 V (Gnd) supply lines are provided to the RF clamp by using the original cable from the C726 decoder to the coaxial relay. The RF clamp is provided with a 7–way female connector. The wiring of the connector to the RF clamp is such that once it is installed, the RF clamp must be connected to supply 12 V DC to the coaxial relay. This ensures that the relay cannot operate unless the clamp is connected in circuit, which prevents high levels of RF energy from reaching the multicoupler.

Three RF clamp assemblies (part number 08–05656–001) are provided with this Service Bulletin.

The new implementation is documented in system drawing 03–00987 Issue C. The RF clamp is documented in assembly drawing 08–05656 and schematic drawing 04–03240.

Implementation

The cable currently connecting the C726 decoder to the coaxial relay in each system is a 4 core cable. The black and blue cores of this cable are unused. These cores have been cut off so they are level with the end of the sheath at both ends of the cable. To provide 0 V (Gnd) to the RF clamp, the black core of the cable must be accessed. The following installation procedure applies to each transceiver system.

❑ Ensure power to the equipment is switched off.

❑ In the rear of the cabinet, de–solder the red and white wires from the coaxial relay.

❑ Loosen the nut securing the cable P clip to the relay and pull the cable through the P clip.

❑ Restrip the sheath exposing 30 mm of all cores within the cable.

❑ Cut off the newly exposed blue core so that it is level with the sheath.

❑ Terminate the red, white and black cores on the 7–way male connector provided with the RF clamp (see Figure 2).

❑ Remove the front panel from the C726 decoder.

❑ Pull through approximately 60–90 mm of the relay cable to enable the cable sheath to be stripped to expose the blue and black cores.

The cable gland on the left hand side may have to be removed temporarily.

- ❑ Terminate the black core to a suitable 0 V (Gnd) terminal.

  Terminal 7 of connection strip J1 is suggested (see Figure 3 and assembly drawing 08–04903).

- ❑ Sleeve the blue core and leave unterminated.
- ❑ Replace the front panel of the C726 decoder.
- ❑ Fit the RF clamp to the NO port (Rx) of the coaxial relay.

  Orientate the RF clamp as specified on the label.

- ❑ Connect the coaxial cable from the receiver multicoupler to the opposite end of the RF clamp.
- ❑ Rotate the RF clamp such that the 7–way female connector is positioned to the front of the relay.
- ❑ Connect the 7–way male connector on the cable from the C726 decoder to the RF clamp.
- ❑ Pass the free cable end through the P clip on the relay and retighten the securing nut.
- ❑ Terminate the red and white cable cores to the relay as before. Form and tie off the cables neatly within the cabinet.
- ❑ Reinstall the multicoupler.
- ❑ Switch on the power to the equipment and test for satisfactory operation.
- ❑ Repeat for the other two transceiver systems.

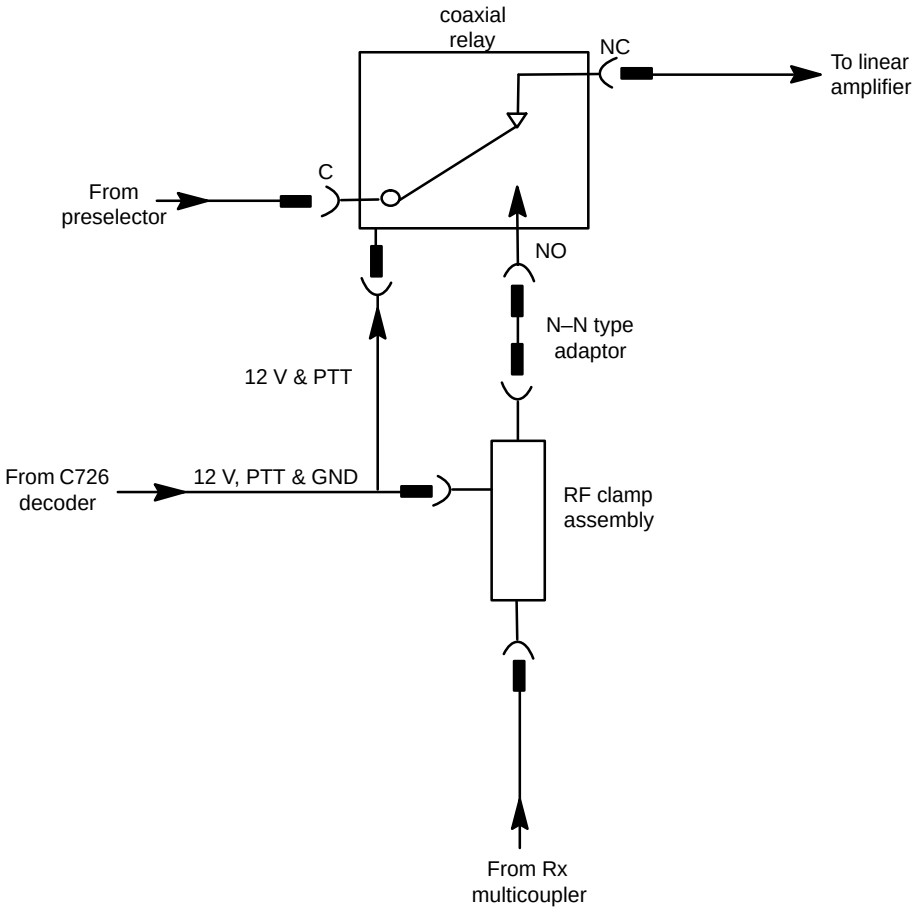

Figure 1: Positioning of the RF clamp assembly

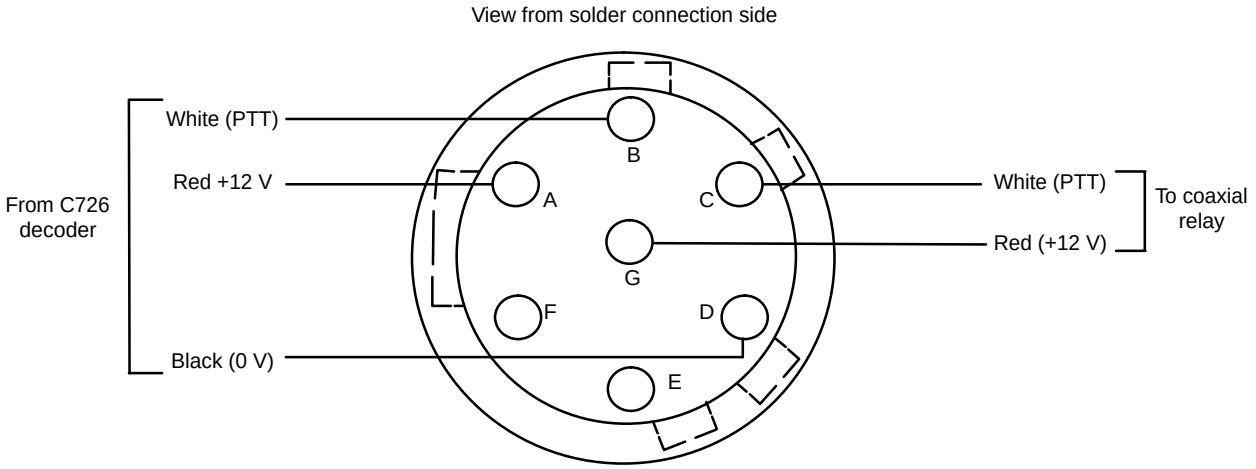

Figure 2: Wiring details for the 7–way male connector

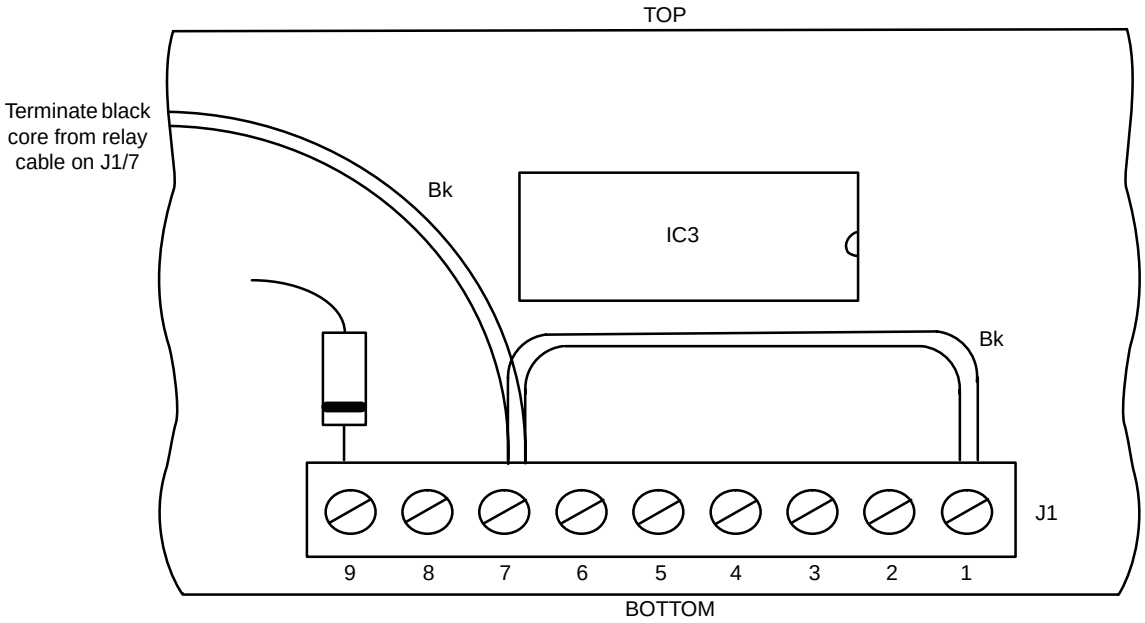

Figure 3: Part of C726 decoder