Replacing an old type IPA with a new type IPA

Replacement instruction

This engineering note describes the procedure to replace an old type IF Preamplifier (IPA) with a new (version 02) type in antenna units (or beacon units) fitted with a Motor Controlled Gunn (MCG). Because of the complexity of the procedure, it is strongly advised to do this in an indoor environment.

Tools required
For the replacement the following tools are required (photo 1):

1. Metric open ended spanner no. 8.
2. Torque wrench for SMA connectors.
3. Hexagon key 2.5 mm.


Photo 1

Parts required
The following parts are required :

1. IPA type A5IPA version 02 (serial number YY-02XXX).
2. Set of 4 flexible coaxial (semi-flex) cables with angled and straight SMA connector.
3. 2 Stainless steel screws M3x6 mm with washers and spring washers.

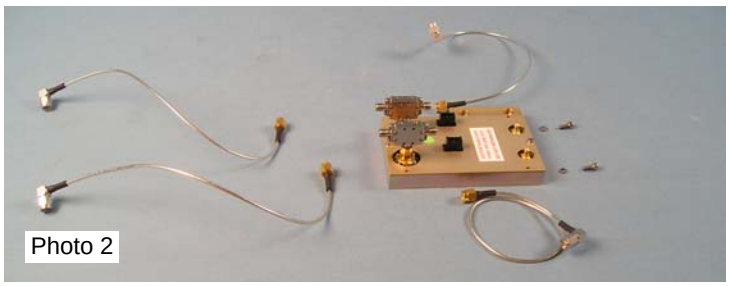
Photo 2

Replacement procedure

1. Switch off the 230 VAC supply to the Antenna Unit (AU).

2. Remove the antenna from the AU and put a protective cover on the antenna flange of the AU.

3. Undo the three snap locks with which the Bottom Cover (BC) is fixed to the AU or BU and lower the Bottom Cover from the AU or BU. Let the BC hang on the two straps provided for.

4. Disconnect the power supply cable and the flat cable connecting the bottom cover with the top of the unit, disconnect the two straps and remove the bottom cover. Place the top unit upside down on a workbench.

5. Unscrew the four semi-rigid coaxial cables connecting the mixer of the sum and dif channel of the IPA with the double directional coupler, the waveguide to coax transition and the phase shifter. These cables are not used again after replacement of the IPA. See photos 3, 4 and 5.

6. Pull the two SMB coaxial cables from the IPA.

Artemis MK5 Engineering Note EN5-6

Double directional coupler

Phase shifter (dif channel)

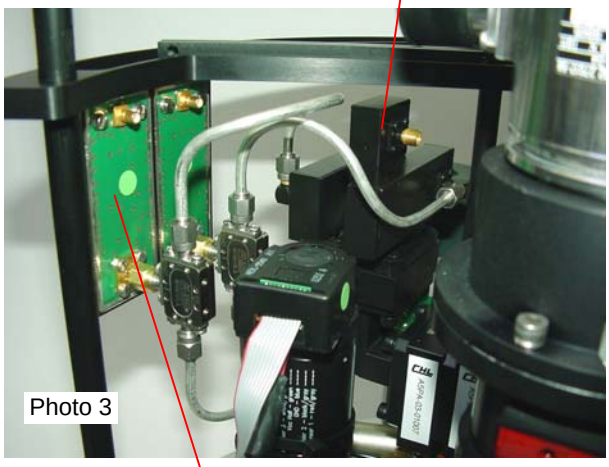
Photo 3

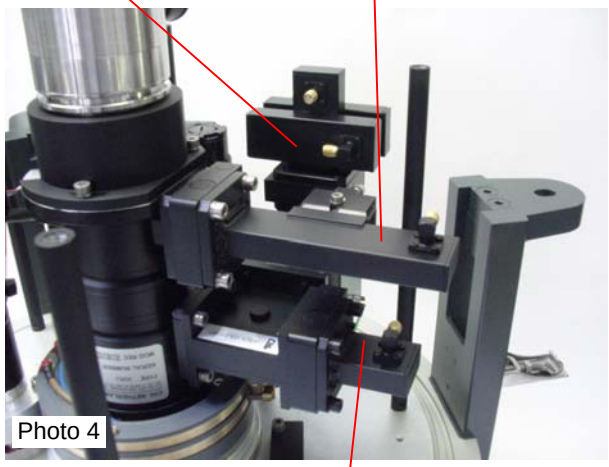
Photo 4

Old type IPA

Waveguide to coax transition (sum channel)

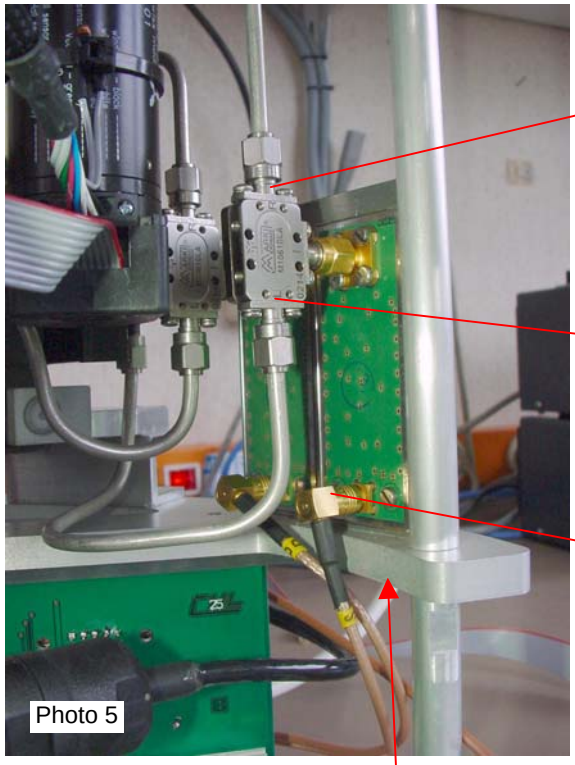
Photo 5

RF input mixer

LO input mixer

SMB coax

Mounting screws IPA

7. Remove the two screws which hold the IPA in place (see photo 5).

8. Mount the new IPA in the same position the old IPA was, using the two M3x6 mm screws with washers and spring washers.

9. Connect the SMB coaxial cables from the interconnection board (ICB) to the IPA, making sure to connect the cable marked “sum” to the SMB connector marked “sum” and the cable marked “dif” to the SMB connector marked “dif”.

10. Use a semi-flex coaxial cable to connect the SMA output of the waveguide to coax transition to the RF input of the IPA’s sum channel mixer.

    Note on the use of the semi-flex coaxial cables:
    Coil excess length of the cables, but make sure to maintain a minimum bending radius of 4 cm.

11. Use a semi-flex coaxial cable to connect the SMA output of the phase shifter to the RF input of the IPA’s dif channel mixer.

12. Use semi-flex coaxial cables to connect the SMA outputs of the double directional coupler to the local oscillator (LO) input of the IPA’s sum and dif mixer.

13. Tighten all SMA connectors, using a torque wrench for SMA connectors.

14. Connect the two bottom cover straps, connect the mains cable and the flat cable and put the bottom cover on and lock it by closing the three snap locks.

15. Install the antenna unit, mount the antenna and connect 230 VAC, an operating panel and/or the work station running the Artemis control software.

16. Check correct operation of the station against a counter station.

    If the antenna locking is not optimal, adjust the phase shifter according Engineering Note EN5-3.

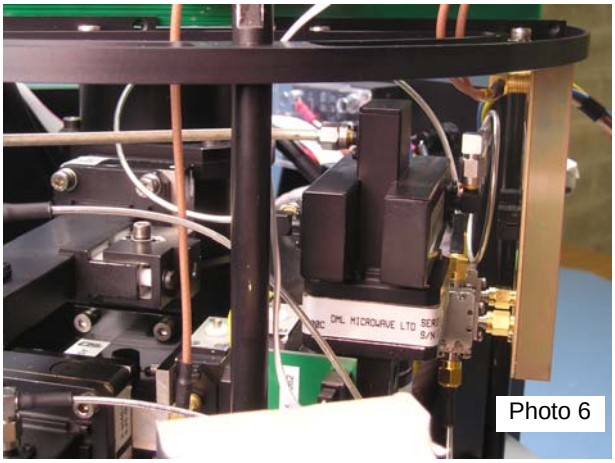

Photo 6

Distribution

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