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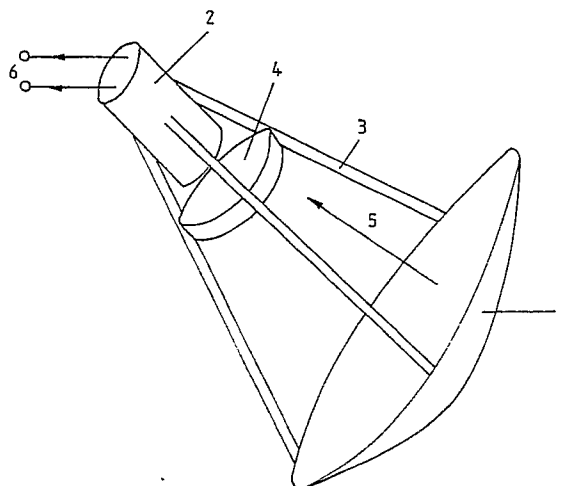
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54 **Microwave antenna unit.**

The alignment of a microwave antenna unit including a dish 1 and an antenna 2 may be difficult if in case of good propagation conditions the maximum of the provided signal with respect to the angle of position is very broad. It is an object to enable exact alignment in such cases without using complex measuring instruments. Between reflector 1 and antenna 2 a microwave attenuating member 4 is provided which attenuates the microwave energy radiated from the dish 1 to the antenna 2 so that the maximum becomes less broad. The member 4 simulates a lower field intensity for example in case of heavy rain on the received signal.



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The invention concerns a microwave antenna unit in form of a dish having a reflector and an antenna converting the received microwave energy into an electrical signal. Such so-called dishes are used especially for reception of television signals or sound signals in the frequency range of about 10 - 20 GHz by satellite. For proper reception a very careful and exact alignment of the dish in horizontal and in vertical direction is necessary. Generally such alignment is made by adjusting the position of the dish to maximum value of the output signal of the antenna.

Within said frequency range the field intensity depends upon the propagation conditions. Especially high humidity in form of rain or fog may severely attenuate the field intensity whereas with fine weather a high field intensity is achieved.

Under good propagation conditions the maximum of the signal provided by the antenna with respect to the angle of position is so broad that an exact alignment to the centre of the maximum becomes difficult. There are instruments by which even in case of such broad maximum a correct alignment can be achieved. Such instruments however are very expensive and in many cases not available.

It is an object of the invention to achieve exact alignment of the dish without necessity of complex instruments even in case the maximum is relatively broad due to good propagation conditions.

According to the invention a microwave attenuating member is removably interposed between the reflector and the antenna.

It was found that a very simple member of microwave attenuating material between the reflector and the antenna is able to attenuate the microwave energy received by the antenna in a desired way so that for example the effect of heavy rain on the received signal can be simulated. By so artificially decreasing the field intensity at the antenna by said member the maximum of the signal at the output of the antenna with respect to the angle of position of the antenna unit is made smaller so that a correct alignment of the dish becomes possible. After alignment said member is removed. The solution according to the invention is very simple as only a very cheap and simple member is used whereas complex instruments for measuring the maximum and finding out the centre of the maximum are no more needed. So the invention enables a correct alignment of a dish independent from the weather and the propagation conditions.

Preferably said member is of a material in form of glass, plastic or ceramic or a combination thereof. Such material has the desired attenuation properties in the frequency range of microwave reception, that is about 10 - 20 GHz.

In one embodiment of the invention said mem-

ber is turnably fastened to the antenna unit so that it may be moved into positions inside and outside the signal path between the reflector and the antenna. For example the member may be fastened to the antenna unit by means of a hinge in order to move it into the signal path for alignment purpose and outside the signal path for optimal signal reception. The member may be turnable into different positions between said positions in order to achieve different amounts of attenuation according to the special propagation condition and field intensity.

The size and the material of the member is chosen for example so that the member provides an attenuation of about 6 db. The member may be provided with means for repeatedly fixing it to the antenna and removing it. Such means may be of general art, for example of a so called snap-in.

In order that the invention may more readily be understood, a description is now given by way of example only, reference being made to the sole figure showing a dish for microwave reception.

The Figure shows an antenna unit in form of a dish including a reflector 1 to which the antenna 2 is fastened via three supports 3. The antenna 2 includes a transducer converting the received microwave energy into an electrical signal available at output terminals 6. Between the antenna 2 and the reflector 1 a microwave attenuating member 4 is fastened to the supports 3 by any suitable means, e.g. by clamping means, screws, snap-in or magnet. The member 4 has the form of a flat round plate and is made of glass, plastic or ceramic. The member 4 attenuates the microwave energy radiating from the reflector 1 in direction 5 to the antenna 2. By this means a maximum of the signal at terminals 6 with respect to the angle in the position of the antenna unit can be made smaller in order to allow exact alignment of the antenna unit in horizontal and vertical direction.

The member 4 may be fastened to supports 3 by means of a hinge so that it can be moved into the signal path for alignment and outside the signal path for proper reception without attenuation. The member 4 may form an integral part of the structure, e.g. be soldered or forming one part with the supports 3. When alignment has been made by using the member 4 the member 4 may manually be broken from the supports 3 and then thrown away or used for a further alignment procedure later.

Claims

1. Microwave antenna unit in form of a dish having a reflector and an antenna converting the received microwave energy into an electrical signal, **characterized by** a microwave attenu-

ating member removably interposed between the reflector and the antenna.

2. Antenna according to Claim 1, **characterized in that** said element is of glass, plastic and/or ceramic plate material. 5
3. Antenna according to Claim 1, **characterized in that** the element is turnably fastened to the antenna so that it may be moved into positions inside and outside the signal path between the reflector and the antenna. 10
4. Antenna according to Claim 1, **characterized in that** said element is fastened to the antenna by means of a hinge. 15
5. Antenna according to Claim 1, **characterized in that** the member is turnable into different positions in order to achieve different amounts of attenuation. 20
6. Antenna according to Claim 1, **characterized in that** the member is attached to the antenna by snap-in fastening means. 25
7. Antenna according to Claim 1, **characterized in that** the attenuation of the signal effected by said member has a value of about 6 db. 30
8. Member according to Claim 1, **characterized by** fastening means for fixing it to a microwave antenna.
9. Member according to Claim 1, **characterized in that** it consists of a material having appropriate microwave attenuating properties. 35
10. Antenna or member as described within the specification and the drawing. 40

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