

A new spin on hybrid rotary joint assemblies

With miniaturisation progressing in all areas of component design, **SPINNER** is changing the way in which modern radar systems are built.

A more compact design for the core component of the radar, the rotary joint assembly, is increasingly in demand.

Most radars in use have the radio frequency (RF) amplifiers on the stationary side of the radar, meaning that complex rotary joints are required to "transport" the RF to the rotating antenna.

Due to the high number of RF channels, older radars require large and costly rotary joints, and because of the size of these joints, slip rings for signal and power transmission would be partly separated from the main RF joint (stacked on top of the RF joint). SPINNER began to design more-integrated solutions for these applications many years ago, eventually becoming a standard with all European and Asian manufacturers.

The latest trend driven by new technologies is the integration of additional transmission systems like fibre optics and media joints. Most of the new designs currently under development consist of the following groups of transmission technologies:

- RF rotary joints
- slip rings
- fibre-optic rotary joints (FORJ)
- fast Ethernet transmission
- media joints
- encoders.

Together with its partner, Schleifring, SPINNER is a world-leading supplier of hybrid systems for these highly integrated rotary joint assemblies. All major European vendors in France, Germany and Italy, and some Indian customers are using SPINNER hybrid rotary joints in their radars.

Whether air traffic control radars, Doppler weather radars or the whole range of possible applications for defence systems, compact designs help to reduce costs and increase reliability of systems. Low-profile designs



Five-channel rotary joint with slip ring.



Dual-channel rotary joint for satcom.

like SPINNER's hybrid units or the new dual-channel rotary joints for satcom help to reduce the size and wind load of radomes, a significant advantage over traditional rotary joint designs.

The integration of slip rings for signal, video and high-current transmission with rotary joints in a compact design is state-of-the-art technology, which has been in production by SPINNER for over 40 years.

Modern radars have to transmit a huge amount of data, so, in addition to traditional signal transmission with slip rings, SPINNER also offers fibre optic single and multichannel rotary (multimode/single mode) joints with currently up to 21 separate fibre channels—unlimited transmission bandwidth. As the fibre channels require the core of the rotating system, all other transmission systems need to be built around the FORJ in the centre. Using this technology, weight and size can be reduced.

To combine RF signals, SPINNER has a wide range of contactless waveguide and coaxial hollow-shaft designs. These are available for low and high-power applications and can easily be combined with other systems such as fast Ethernet channels.

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SPINNER and Schleifring are the only suppliers that offer contactless fast Ethernet with a free inner bore of approximately 25cm. This design particularly helps to minimise the length of such hybrid designs. These RF modules are designed and optimised to meet the highest isolation requirements and the lowest-available VSWR. They are maintenance free due to the contactless design of the transmission path. For phased array antenna systems, most of

the power amplifying is done right behind the antenna panel.

All the power amplifiers either need forced air or water cooling – if water, the media joints need to be 100% watertight. Flow rates of several hundred litres a minute are quite a common requirement.

Last but not least, encoders play a significant role in the new designs of rotary joints. No matter which type of encoder (inductosyn, optical, magnetic) is used, SPINNER has the matching solution to integrate them into hybrid systems.



The inner workings of a rotary joint.

the rotary joint assembly.

Beyond the ability to build highly integrated designs of all the aforementioned technologies, SPINNER brings solutions to market that have not been possible before due to the large size of the rotating joint combined with a high weight.

The R&D and production facilities of SPINNER and its partner, Schleifring, are located just 40km apart, enabling the close coordination of designs, compact interfaces between all the different modules and transmission technologies, all designed in the

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shortest possible turnaround time.

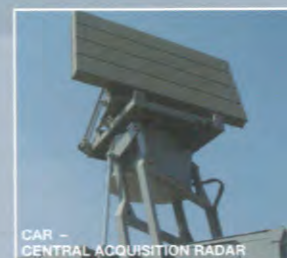
This unique partnership of world market leaders in RF and slip ring technologies brings significant savings, innovation and numerous advantages to customers. SPINNER can meet your requirements to provide you with a solution to get your system to the next level of reliable high performance. ■

Such compact designs are used in land, marine and airborne radar applications. A high grade of integration is particularly necessary for airborne applications as weight must be kept as low as possible, while still maintaining the outstanding performance of

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16 RF CHANNELS, 125-WAY SLIP RING



ASR-S - AIRPORT SURVEILLANCE RADAR



ASR-S - AIRPORT SURVEILLANCE RADAR
8-CHANNEL INDUCTOSYN

Superior RF Rotary Joints and Slip rings

- Fibre optic – single channel, multichannel up to 21
- Fast Ethernet transmission and media joints

for

- Air traffic control radars
- Defence applications – air, sea, land

High Frequency Performance Worldwide

SPINNER is a global leader in developing and manufacturing state-of-the-art RF components. Since 1946, the industries leading companies have trusted SPINNER to provide them with innovative products and outstanding customised solutions.

Headquartered in Munich, and with production facilities in Germany, Hungary, USA and China, the SPINNER Group now has over 1,300 employees worldwide.

Our subsidiaries and representatives are present in over 40 countries and provide our customers with an international network of support.

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