



### AN-470 All About MESH – a data transfer network

#### ***In Brief***

MESH is a new technique for building specialised data networks.

We use this kind of network to connect a quantity of Mesh Unloader units back to a central PC for data collection and reporting etc. The Mesh network is just that – a network of radio connected units that we use to transport data. Best of all, it is reliable, low cost and robust.

There are three special items of equipment in the Mesh Network;

1. *Node*. This is the unit inside a Mesh Unloader unit that connects the computer in the Mesh Unloader into the Mesh Network. It is an interface between data collection equipment and the network.
2. *Router*. This extends the range and size of a Mesh Network by relaying the incoming signals to other units further along in the network.
3. *Base*. This connects the PC or other equipment into the Mesh Network. It is an interface.

#### ***Why Called “Mesh”***

The word “MESH” means that the network can be created much like a grid with units at each intersection. Units cross connect providing redundant signal paths.

Each unit in the Mesh network provides communications either to a piece of equipment (like a Mesh Unloader) or passes the data onto other parts of the network (called a routing function).

The Mesh network is “robust”. If one router fails or is switched off, other routers in the network will attempt to take over the load if they have coverage. In this way, the Mesh network attempts to self-heal in the event of fault.

### ***Applying Mesh Communications***

Central to the ability to extract and manage data from wands in a large area such as a shopping centre is the means of getting the data back to the master computer.

Running data cables between units in a shopping centre is an extremely expensive and difficult task. Using a radio network is far cheaper and offers many advantages.

Additionally, more than one Mesh Unloader will be required and is recommended for larger sites so as to speed up data extraction and to make it far more responsive and near to real time. The more Mesh Unloaders used, the faster wands are unloaded.

Another key requirement is the ability to flexibly expand the system without great cost.

The "Mesh" radio network system provides these facilities in an ideal way.

At the data engine (the master computer – a PC or similar) a "Base Station" unit is installed. This connects to the PC and is the master unit in the Mesh Network system. The Base Station is a small radio data transceiver that communicates with other Mesh units in the area. The PC sends commands out to units spread around the shopping centre for them to return data to it.

Mesh Unloaders spread throughout the shopping centre receive commands from the Mesh Network. Each Mesh Unloader has a Mesh Network "node" in it that communicates via radio back to the base station. In essence, the PC sends a command to a Mesh Unloader which responds to the command.

Should the location of any Mesh Unloaders be too far away from the base station (for direct communications) then "routers" are installed. These are like "relay stations" - they take data from the base station and pass it along the line into Mesh Unloaders or on to other routers so that range can be extended significantly.

A number of routers can be installed in cascade thereby extending the range to many hundreds of metres from Mesh Unloaders back to the base station.

In this manner, almost any site can be catered for. A number of routers, Mesh Unloaders and a base station can handle many tens of thousands of records per day automatically passing data from Mesh Wands back to the data engine / master computer.