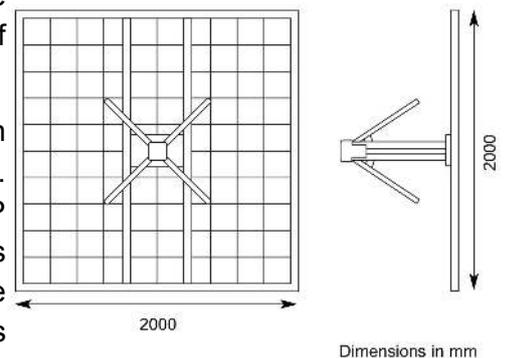
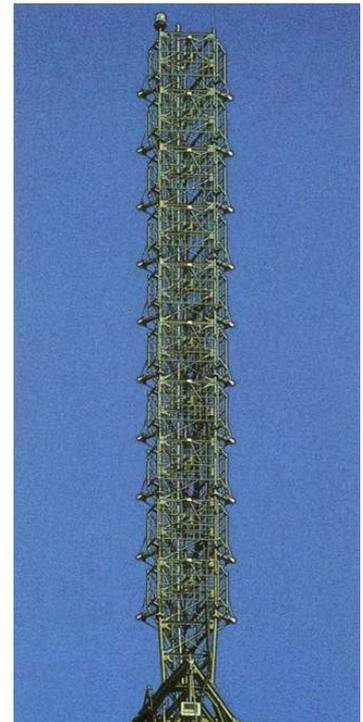


The ADBL Low Windload Spearhead is a versatile FM CP panel, with high performance that will optimise system cost by adding minimum loading to the tower. The galvanized steel construction of both the screen and the dipole assembly assures long trouble-free service while providing high quality circular polarisation as a result of the quadrature feed to the two arms of the crossed dipole.

The Low Windload Spearhead Panel has been derived from the highly successful standard ADBL Spearhead with the specific aim of minimising the loading imposed on the supporting structure. This has been achieved while still retaining high power handling and good bandwidth performance. The panel may be used for multi-channel operation over a 10MHz range, anywhere in the FM band from 88 to 108MHz. A VSWR of 1.1:1 is achieved for each operating channel.

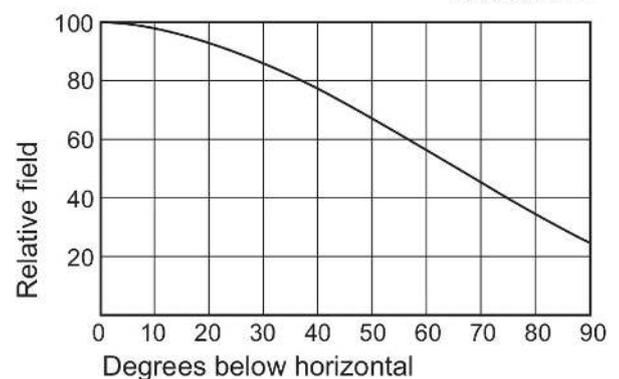
With the aim of providing excellent omnidirectional radiation patterns when using three panels per tier around triangular towers, the Spearhead panel has been developed with a 6dB beamwidth of 120deg. A combination of unequal power division and appropriate phasing between faces also provides the facility for a wide range of customised directional patterns. Single panel data is given in Fig.2.

Windloading is further reduced by the use of round cross section members for all parts of the galvanized screen and dipole assembly. Weather protection of the actual dipole feedpoints is provided by GRP covers so that no electrical de-icing of the elements is required. This greatly increases reliability as well as reducing operating costs. The careful selection of all materials, both conductors and dielectrics, as well as the pressurisation of the feed system are key features in ensuring the quality of this ADBL product.

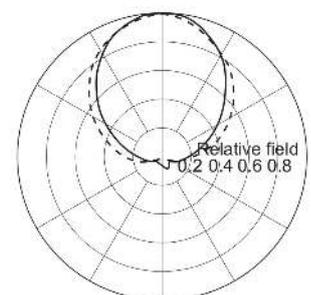


GENERAL ARRAY DATA

The weights and loading figures given are for symmetrical antennas with 3 panels per tier and do not include the support tower. Loadings are in accordance with UK Standard CP3 and North American Standard RS222F which are equivalent to one another. They will vary depending on the required power rating of the feed system and other factors. ADBL should always be consulted with reference to specific installations. The gain figure quoted is the mean value for omnidirectional arrays and is achieved in each plane of polarisation. Allowance has been made for typical distribution feeder losses and for null fill as indicated in the vertical plane radiation patterns.



Aerodynamic area	
Front	1.3m ²
Side	0.9m ²
Weight	82kg
Gain, each polarisation	2.9dB
Power rating	10kW
Input connectors (Two per panel)	7/8 IEC/EIA



The Spearhead panel allows complete antenna arrays to be designed and built for a wide variety of applications. Since ADBL also designs and manufactures power dividers and other distribution feeder components in all sizes and ratings from 7/8 to 9in. IEC/EIA, there is virtually complete freedom in the array design. This means that antenna systems may be developed and built to individual specifications. Local environmental conditions are always evaluated and transmission line components will be selected to provide operating safety factors, for both power and voltage, appropriate to the transmitter power employed. Peak voltage ratings are especially important for multi channel operations.

RADIATION PATTERNS

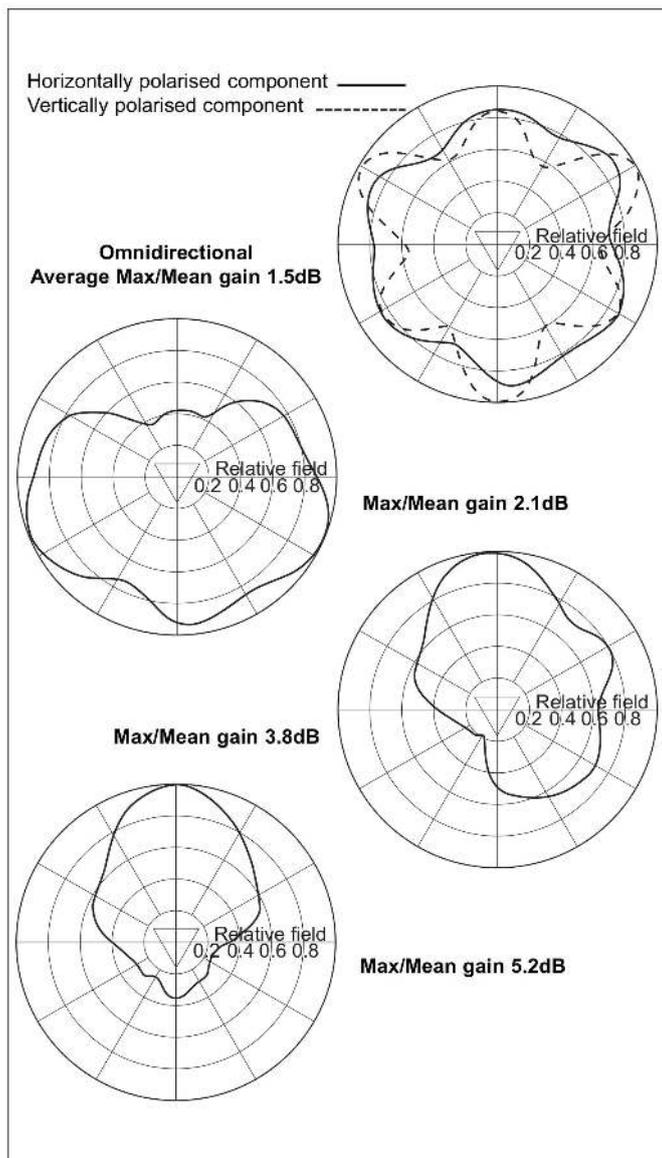
The plots to the left shows omnidirectional horizontal plane radiation patterns as well as examples of directional patterns that may be achieved. These patterns correspond to antennas built around 2.4m. triangular towers. The following page depicts typical vertical plane patterns for arrays of between two and twelve tiers. The values of beam tilt and null fill provided for any aperture may readily be tailored to suit individual station requirements.

ANTENNA TYPE NUMBER

The antenna's type number provides a convenient reference to its main characteristics as illustrated below. For the Low Windload Spearhead, six items are variable: the operating frequency (or frequency range), the number of tiers and the number of panels per tier, the total power rating, the HRP type and the number of inputs.

A six tier antenna with three panels in each tier, designed for multi-channel operation, having a power rating of 60kW, an omnidirectional horizontal radiation pattern and being fed by two main transmission lines would thus be designated F88:96C6.3LS60ND2.

An antenna not having the same number of panels in every tier has the digit representing the number of panels per tier replaced by an 'S' Horizontal radiation pattern types are broadly designated: ND = Non Directional or Omni, C = Cardioid, P =Peanut, S =Special.



No. of tiers	Aperture m	Aerodynamic area m ² CP3 (RS222D)	Weight kg	Mean Gain dB
2	5	5.6	550	-0.2
4	11	11.1	1050	2.9
6	17	16.7	1600	4.6
8	23	22.5	2150	5.8
10	29	28.0	2700	6.9
12	35	33.5	3200	7.7

