



August 14, 2001

Prepared by Lou Guerin

SPICE Product description

The product is a 1900MHz transceiver system for mobile phone telecommunication use. The product is known as SPICE 'Small Profile Intelligent Coverage Element' with the designation of 'bSPICE' (base unit) and 'cSPICE' (coverage unit) and is defined as a 'Frequency Translating Repeater System'. Each SPICE unit will have coverage and link frequencies assignable within its entire GSM frequency band.

GSM 1900: 1850-1910 MHz paired with 1930-1990 MHz.

The SPICE network is based upon a distributed coverage architecture, where the SPICE network provides the RF distribution functionality, but relies upon the underlying GSM system to provide the core functionality of the GSM system. This approach dictates that the SPICE network must be essentially transparent to the underlying GSM system.

Operation:

The bSPICE

has antenna ports and interfaces directly with a third-party Base Transceiver Station (BTS) via cables; it can accommodate both duplexed and separate TX & RX connections. It translates the signal received from the BTS to a link frequency, usually a channel within the operator's band allocation. The bSPICE shall be capable of transmitting to a cluster of cSPICE located within the link range of 8km when the cSPICE is at a typical height of 30 meters. This link range assumes in-band back haul, flat terrain, and non Line-of-Sight conditions. The minimum separation between any channel frequencies (link or coverage) shall be 600 kHz.

All external communications with the bSPICE shall be via an internal modem or equivalent modem chipset to allow setup, monitoring & reconfiguration. The maintenance and supervision of a network of SPICE Units will be performed by the OMC (Operation & Maintenance Center) system, resident at the network operator's central office.

The cSPICE

unit contains an integral antenna and receives its input signal on a link frequency from a bSPICE. It shifts that signal to the desired coverage frequency for transmission to the subscriber's handset. No decoding is performed in the main signal path, only RF translation. It will typically be employed as part of a cluster that is simulcasting using an Omnidirectional Pattern (standard antenna) it provides coverage to the subscriber's handset and is located in the footprint of the coverage area. It may be part of a cluster of units that are simulating the same carriers, from the same BTS.

PCS
VERTICAL POLARIZED
OMNIDIRECTIONAL
ANTENNA

RACAL Part No. 1971-000

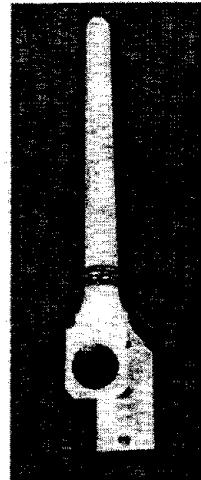
J. Mikelliet

TYPE 8100
VP/360/2

- Discrete Visual Profile
- Indoor/Outdoor Applications
- Mechanically Robust
- Simple Mounting Arrangement
- 5 Year Warranty

ELECTRICAL PERFORMANCE

Frequency Range	:	1850-1990 MHz
Gain	:	2dBi
VSWR	:	1.3:1 maximum
Polarization	:	Vertical
Horizontal Beamwidth	:	360°
Vertical Beamwidth	:	70°
Power Rating	:	100W
Impedance	:	50Ω
Connector	:	SMA or N Type



**PCS
VERTICAL POLARIZED
OMNIDIRECTIONAL
ANTENNA**

TYPE 8100 CONT'D

MECHANICAL PERFORMANCE

Length	:	6in (152mm)
Diameter	:	.8in (20mm)
Weight	:	4oz (.2kg)
Mounting	:	Single M/8 nut
Radome Material	:	Polypropylene

ENVIRONMENTAL SURVIVAL

Temperature : -40°F to +158°F (-40°C to +70°C)
 Wind Survival : >150mph
 No Degradation During or After : Salt mist/driving rain and any moisture ingress

Specifications subject to change without notice

**Z1130 - 1710-1990 MHz Dual Band DCS/PCS
Directional Panel Antenna**

The MAXRAD dual band directional panel antenna is designed to cover frequencies between 1710 and 1990 MHz. It provides maximum gain with a small, low-profile package with efficient and stable performance across the band. The panel can be mounted in a wide variety of indoor or outdoor locations.

General Specifications:

Radome Material:

UV-stable, Cardinal #P004 Grig Gray

Back Plate Material:

Aluminum

Polarization:

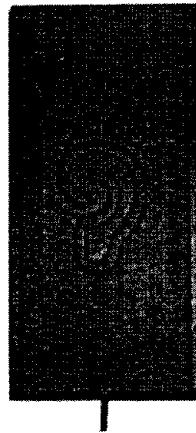
Vertical, linear

Lightning Protection:

DC grounded

Mounting Hardware:

4 holes in side of panel antenna



Z1130

Electrical Specifications

Directional Panel Antennas for DCS/PCS

Model #	Frequency Range	Gain	Front to Back Ratio	3 dB Horizontal	3 dB Vertical	Maximum Power Input	Connector
				Beamwidth	Beamwidth		
Z1130	1710-1880 MHz	14 dBi Minimum	25 dB	40°	20°	< 2.0:1	20 W 12" RG-58/U Type N, Female
	1850-1990 MHz	14 dBi Minimum	25 dB	40°	20°	< 2.0:1	20 W 12" RG-58/U Type N, Female

Mechanical Specifications

Directional Panel Antennas for DCS/PCS

Wind Loading (Frontal)

Model #	@100 mph Wind	Temperature Range	Dimensions	Weight
Z1130	39.8 lbs.	-51°C to +71°C (-60°F to +160°F)	7.4 x 15.38 x 1.5 in	1.2 lbs

Vertically Polarised Omni antennas - the VOA series

These medium and high gain colinear antennas combine lightweight construction with full environmental protection using rugged glass fibre radomes and aluminium mounting spigots.

All VOA antennas are centre fed and provide stable, ground-plane independent radiation patterns. Unless otherwise specified all VOA series antennas have N-type connectors, VSWR of 1.5:1 and are painted gloss white.

 Frequencies from 800MHz to 8GHz

 Medium gain horizontally polarised omnis made to order

 XVO series provides null-fill, electrical down-tilt and side lobe suppression to meet ETSI specifications - special development

VOA10, 10dBi



Relative sizes of VOA series antennas in the same frequency band. Standard diameters are 32mm and 50mm

VOA7, 7dBi



VOA4, 4dBi



Model	Gain dBi	Elevation HPBW degrees	Centre Frequency	Bandwidth %
VOA4	4	40	850MHz-8GHz	±5
VOA7	7	20	900MHz-3GHz	±4
VOA10	10	10	1.8GHz-3GHz	±3

Elevation radiation patterns for VOA series antennas

