RESEARCH DEPARTMENT

Transmitting aerial for the Holyhead v.h.f. television station

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THE BRITISH BROADCASTING CORPORATION
ENGINEERING DIVISION

RESEARCH DEPARTMENT

TRANSMITTING AERIAL FOR THE HOLYHEAD V.H.F. TELEVISION STATION

Technological Report No. E-100

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INTRODUCTION

The Holyhead television relay station came into operation on 24th February 1964. It provides a service to Holy Island.

SUMMARY OF INSTALLATION

Site:	The site is on Holyhead Mountain about 1·5 miles (2·3 km) west of Holyhead, grid reference SH/223825, height 250 ft (76 m) a.m.s.l.
Support Structure:	The support structure consists of a 120 ft (37 m) square-section self-supporting tower oriented with one side on a bearing of 0° ETN.
General Arrangement:	See Fig. 1.
Channel:	Channel 4, with horizontal polarization is used. Both vision and sound carriers are offset -16·875 kc/s.
Aerial:	The aerial consists of two tiers each of two horizontal dipoles mounted on bearings of 65° and 170° ETN, spaced 5 ft 7 in (1·7 m) from the tower axis and fed with equal co-phased currents. The inter-tier spacing is 0·7λ and the mean height 108 ft (33 m) a.g.l. The tower side dimension at this height is 1 ft 3 in (0·38 m). There are independent main feeders to each tier.
Power:	A translator with an output power of 10 W is used.
Templet and Horizontal Radiation Pattern (h.r.p.)	See Fig. 2 and Note.

Gain:

Mean intrinsic gain			1·8 dB
Deduct: losses due to possible misalignment and distribution feeders			0·2 dB
Mean net gain			1·6 dB
Deduct: loss in main feeder (type PT93)	2·1 dB		
network loss	0·6 dB	2·7 dB	
Mean effective gain			-1·1 dB

Programme Link:

The programme is obtained by direct reception of the Channel 1 (vertical polarization) transmissions from Llanddona. The receiving aerial consists of a double 3-element Yagi mounted at a height of 60 ft (18 m) a.g.l., oriented on a bearing of 91° ETN. Protection against corona interference is given by the spike and parasitic reflectors which surmount the tower.

Note:

The aerial design was based on a theoretical h.r.p. of the dipoles alone, neglecting the effects of the support mast and the dipole support booms. A more accurate h.r.p., which included the effect of the dipole support booms, was obtained from measurements on a small-scale model mounted on a thin support pole. This was a reasonable approximation to the full scale aerial in view of the small electrical size of the tower cross section (0·079λ square) and the absence of horizontal screening bars.

ALG

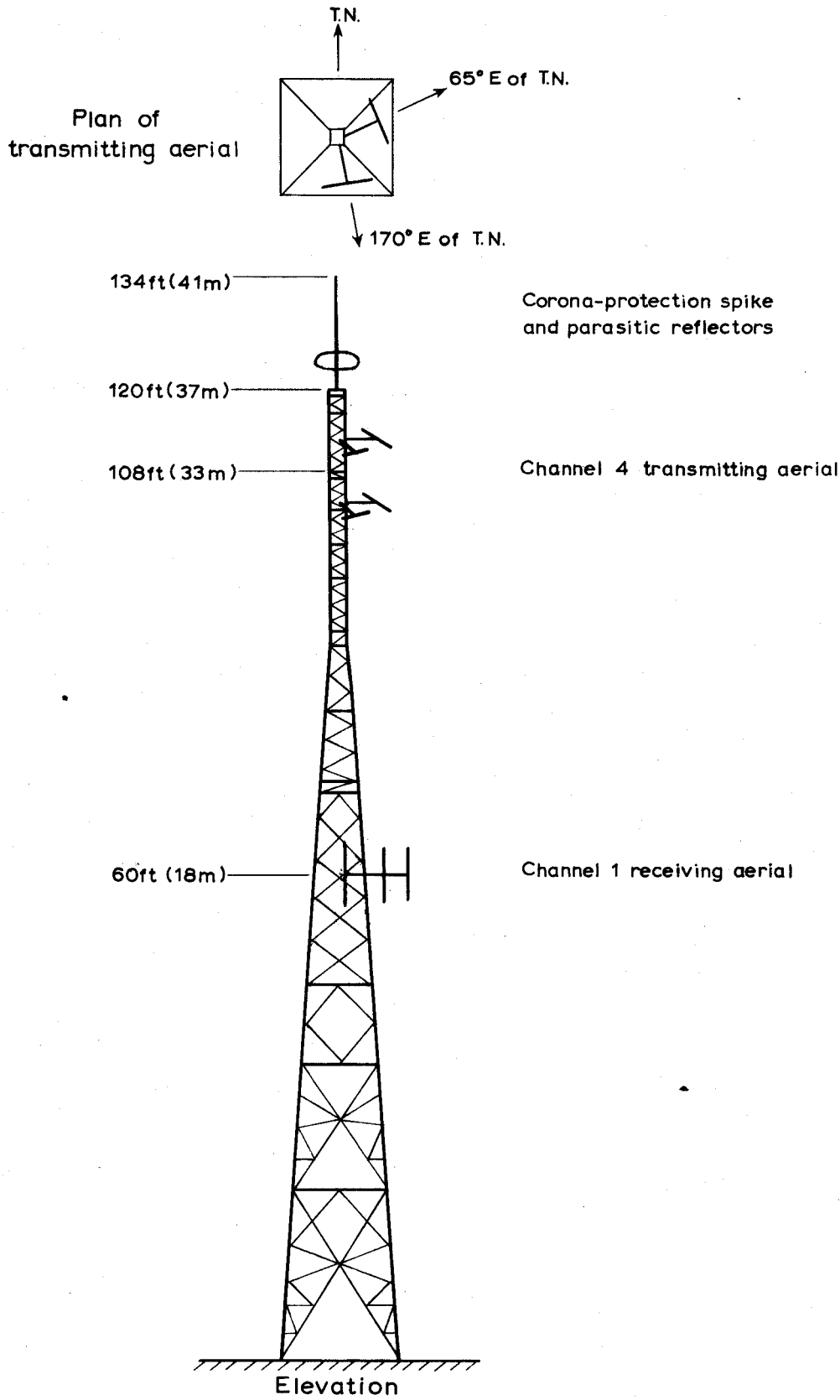

Fig.1. General arrangement of aerials on tower

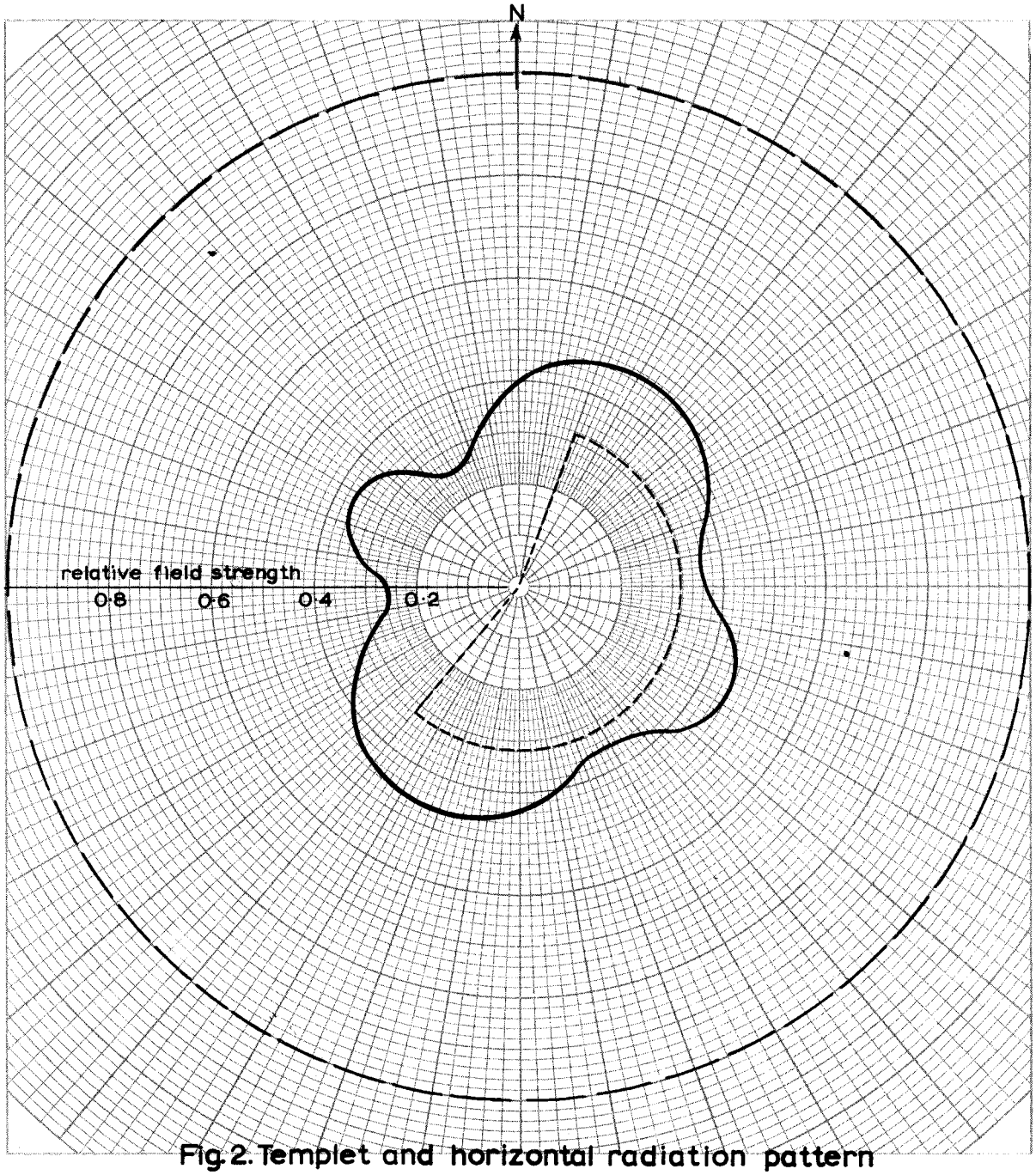

Fig. 2. Templet and horizontal radiation pattern

HORIZONTAL POLARIZATION

Channel 4 (Vision carrier 61·75Mc/s Sound carrier 58·25Mc/s)

Mean effective gain – 1·1dB ——— ——— Maximum permissible E.R.P.

Transmitter power 10W - - - - - - - - - Minimum desirable E.R.P.

Mean E.R.P. 7·8W

Unit field corresponds to an E.R.P. of 50W

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