S.R.E.

Research Department. REPORT No. K.021/2 10th September, 1936.

Serial No. 1936/10

Work carried out by:
R.Parsons,
G.J.N.Tait.

Drawing No.K.021/2.1

SITE TESTING - SOUTH DEVON REGIONAL TRANSMITTER:

PROPOSED SITE AT START POINT.

(Interim Report).

SUMMARY. This report deals with tests carried out at Start Point on a wavelength of 284 metres, and comparison is made with previous results obtained on a wavelength of 258 metres (see Report No.K.021). Measurements were made with the lorry transmitter with 1 kW. to the aerial, and predictions are given of the service expected from a 100 kW. transmitter situated at this point. A map is attached showing the contour where a field strength of 4 mV/metre may be expected. The estimated population within this area is roughly $1\frac{3}{4}$ millions.

Measurements have been taken at a number of sites with a view to providing a service in the South-west and South of England by means of several low power stations working upon a common wavelength of 203 metres. The inherent difficulties of common wavelength working, with the inevitable mush area, make it preferable

to achieve the desired service, if it is possible, by means of a single high power transmitter.

As was mentioned in Report No. K.021, the main difficulty to be contended with is the very low conductivity of the ground in this district, as well as the configuration of the land.

Start Point, by virtue of its position, has the distinct advantage that the direction of propagation to the most important towns in this district is mostly over sea and, as will be seen from the attached table, a fair signal may be expected along practically the whole of the South Coast with the exception of Southampton. The possibility having arisen of using the Scottish National wavelength of 285.7 metres, or even the Midland Regional's wavelength of 296 metres, it was predicted theoretically that a satisfactory service could be provided by a 100 kW. transmitter situated at Start Point. Tests were therefore made in July 1936, using a wavelength of 284 metres, the results of which are shown in the attached table. They agree fairly well with those predicted. The measurements taken of 258 metres were not actually from the same site, but were taken from a field adjoining to the North-west. The actual site is at the beginning of the private roadway leading to Start Point Lighthouse, and the distance to the sea on the East side is only $\frac{1}{2}$ mile.

In 1935, measurements were made on 258 metres in all the principal towns as far East as Hastings, and as far West as Penzance. This year the measurements were repeated on 284 metres and supplemented

by measurements to locate the 4 mV/metre contour for a power of 100 kW. radiated from a high efficiency aerial.

The towns on the coast to the East, which are considered to be of critical importance, are Bournemouth, Southampton and Portsmouth. It will be noticed that although Portsmouth would be well served by 15 mV/metre, Southampton, on account of the greater land-path, is outside the 4 mV/metre line. An anomaly appears to exist in that the mean field in this town is less on the wavelength of 284 metres than that which was obtained during the previous tests on 258 metres. Bournemouth, however, would get a reasonable average field of 7 mV/metre.

It is interesting to note that the 4 mV/metre line extends as far East as Hastings and as far North as Wells.

Plymouth would receive a satisfactory average signal of 12 mV/metre, but unfortunately Exeter is only just inside the 4 mV/metre contour.

Most of the towns of Cornwall would receive a satisfactory service, e.g., Penzance, the most Westerly, lies on the 4 mV/metre contour, but the inland towns of Bodmin, Launceston and Okehampton suffer from the low ground conductivity.

The possibility could be considered of using a directional aerial system to improve the field strength in a selected direction, with regard to which it is interesting to note that the whole service subtends an angle of less than 180° at the transmitter.

Calculations have been made which show that it is possible to use certain types of directional aerials while retaining the anti-fading properties obtainable with a single aerial system. In view of the unusually long distances to be covered by the station due to the over-sea path, it is of the utmost importance to take care to reduce the indirect ray, and so to prevent fading. This will be particularly necessary in the case of Southampton, where the distance is 105 miles and the field-strength low. It will probably be necessary to have some means of varying the vertical directivity of the aerial, in order to be able to choose at will the best transmitting conditions from the point of view of fading.

H L Kirke.

HLK/CHF. 10-9-1936.

TABLE.

Position.	Field Strength: mV/metre.		
	258 metres Measured.	285.7 metres Expected.	284 metres Measured.
Plymouth	10.9	14.9	12.0
Liskeard	3.7	4.9	4.2
Bodmin	1.5	1.9	2.2
St. Austell	11.9	13.0	15.0
Newquay	3.3	3.9	3.2
Truro	4.2	5.6	4.6
Falmouth	11.6	14.2	12.1
Penzance	3.5	4.3	4.0
St. Ives	3.3	4.4	3.9
Camborne	2.7	3.5	3.1
Redruth	2.5	3.3	3.0
Okehampton	1.4	1.8	1.9
Launceston	2.2	2.8	3.4
Tavistock	3.4	3.8	3.9
Dartmouth	107.0	120.0	140.0
Paignton	35.0	44.0	39.0
Torquay	35.0	43.0	43.0
Newton Abbot	9.9	13.3	9.5
Teignmouth	17.8	23.0	19.5

TABLE (Contd.)

Position.	Field Strength: mV/metre.		
	258 metres Measured.	285.7 metres Expected.	284 metres Measured.
Exeter	3.7	4.7	4.2
Lyme Regis	45.0	47.0	50.0
Dorchester	22.0	24.0	23.0
Weymouth	38.0	39.0	38.5
Southampton	3.0	4.0	2.65
Portsmouth	11.9	13.2	15.4
Bournemouth	7.7	8.9	7.2
Wimborne	7.0	8.8	5.1
Brighton	7.0	8.0	8.7
Eastbourne	5.2	6.2	6.9
Hastings	3.3	4.4	3.95
Taunton			3.4
Chichester			9.7
Worthing			8.9
Hayle			2.9
Helston			5.6
Salisbury			3.5
Wells			4.05
Frome			4.1

10-9-36

TESTS AT START POINT. SOUTH DEVON.

4mV/M CONTOUR. 284 M. 100KW. $E_o d_o = 4100$. OMNIDIRECTIONAL AERIAL.

B B C RESEARCH DEPT	
DRN	REPORT
APPD HLA	K.021/2.1