

RESEARCH DEPARTMENT

LOW POWER TELEVISION TRANSMITTERS - SITE TESTS IN LONDONDERRY

Report No K-109

(1956/9)

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SUMMARY

Two sites, Sheriffs Mountain and Lisdillon, have been tested. Of these the Sheriffs Mountain site will provide the better service and, in conjunction with the Divis transmitter, coverage over most of Northern Ireland will be achieved with the exception of the Enniskillen area. Reception tests indicate that the field strength of Divis at Sheriffs Mountain should normally provide a satisfactory R.B.R. link.

1. GENERAL.

The television distribution plan provided for the Londonderry area to be served by a low power horizontally polarised transmission on Channel 2 (51.75 Mc/s). It is proposed to use a 0.5 kW transmitter driving a two-tier batwing-V aerial mounted 256 ft (78 m) above ground level at this site.

Test transmissions were radiated on Channel 2 from a half-wave dipole attached to a balloon flown at 256 ft (78 m) above ground level when weather conditions were suitable for flying the balloon. During periods of unsuitable weather the tests were radiated from a half-wave dipole mounted on the top of a 110 ft (33 m) mast.

The horizontal radiation pattern of the two-tier batwing-V aerial is shown in Fig. 1 and all field strengths have been corrected to conform with this diagram. In preparing field strength tables and contour maps for this report the direction of maximum radiation has been fixed at 195° and 345° for the Sheriffs Mountain and Lisdillon sites respectively. All field strengths quoted are for a receiving aerial 30 ft (9.2 m) above ground level.

The tests to determine whether the Divis transmitter would provide a sufficiently reliable signal for rebroadcasting were restricted to a few observations with a low receiving aerial.

Site data are given in the Appendix.

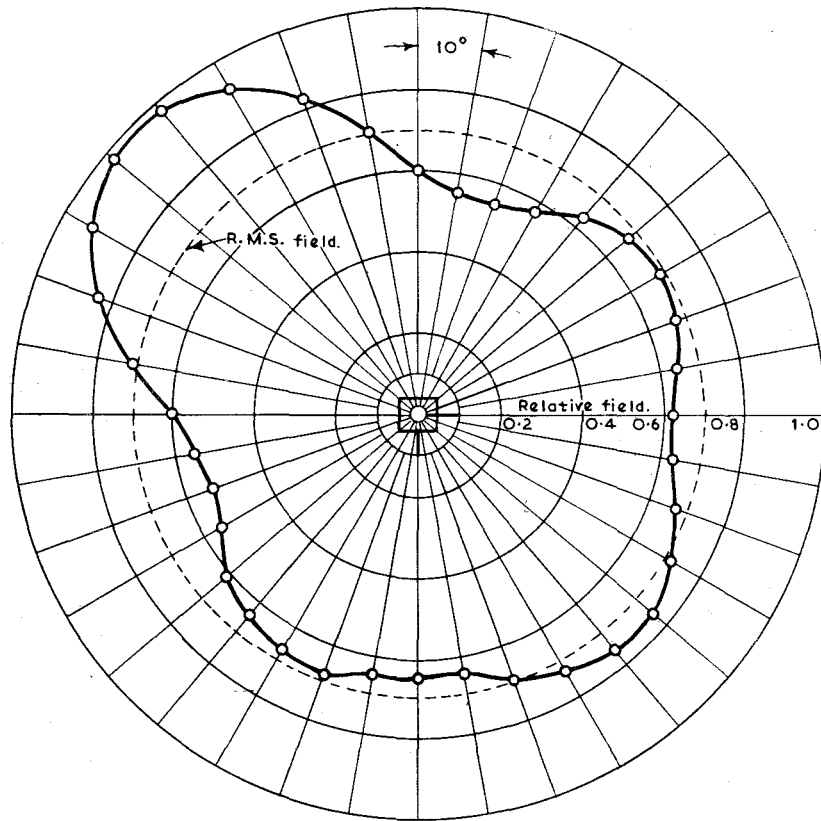


Fig. 1 - H.R.P. of the two-tier batwing-V aerial (Channel 2)

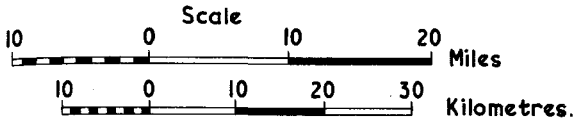
2. RESULTS.

Table 1 gives the field strengths in the principal towns for both sites and for Divis (e.r.p. 12 kW), while contour maps are shown in Figs. 2 and 3.

TABLE 1

| Town | Sheriffs Mountain (Maximum radiation 195°) E.R.P. 0.6-1.5 kW | | | Lisdillon (Maximum radiation 345°) E.R.P. 0.6-1.5 kW | | | Divis Mean E.R.P. 12 kW | | |
|-----------------|--|------|-------|--|-------|-------|----------------------------|-------|------|
| | mV/m | | | mV/m | | | mV/m | | |
| | Max. | Mean | Min. | Max. | Mean | Min. | Max. | Mean | Min. |
| Londonderry | 140 | 20 | 1.2 | 20 | 4.0 | 0.25 | - | <0.1 | - |
| Strabane | 4.2 | 1.3 | 0.27 | 3.1 | 0.8 | 0.12 | - | <0.03 | - |
| Omagh | 0.1 | 0.04 | 0.015 | 0.2 | 0.07 | 0.025 | 0.5 | 0.1 | 0.03 |
| Limavady | 0.34 | 0.19 | 0.08 | 0.31 | 0.17 | 0.07 | 0.8 | 0.2 | 0.04 |
| Coleraine | 0.05 | 0.02 | 0.01 | 0.04 | 0.03 | 0.02 | 1.0 | 0.22 | 0.03 |
| Dungiven | 0.31 | 0.14 | 0.04 | 1.0 | 0.6 | 0.085 | 0.09 | 0.04 | 0.02 |
| Portstewart | 0.91 | 0.24 | 0.1 | 0.16 | 0.04 | 0.01 | 0.35 | 0.1 | 0.03 |
| Portrush | 0.57 | 0.13 | 0.03 | 0.1 | 0.02 | 0.006 | 0.3 | 0.08 | 0.02 |
| Newtown Stewart | 0.51 | 0.18 | 0.08 | 0.42 | 0.17 | 0.06 | - | 0.04 | - |
| Bushmills | 0.03 | 0.01 | <0.01 | - | <0.01 | - | 0.35 | 0.18 | 0.04 |

T. 311.



Note.
 The contours represent field strength in mV/m at 30 ft above ground exceeded at 50% of receiving sites in a given locality. The value exceeded at 90% of receiving sites may be as much as 10dB below the value indicated by the contours particularly in hilly and built-up areas.

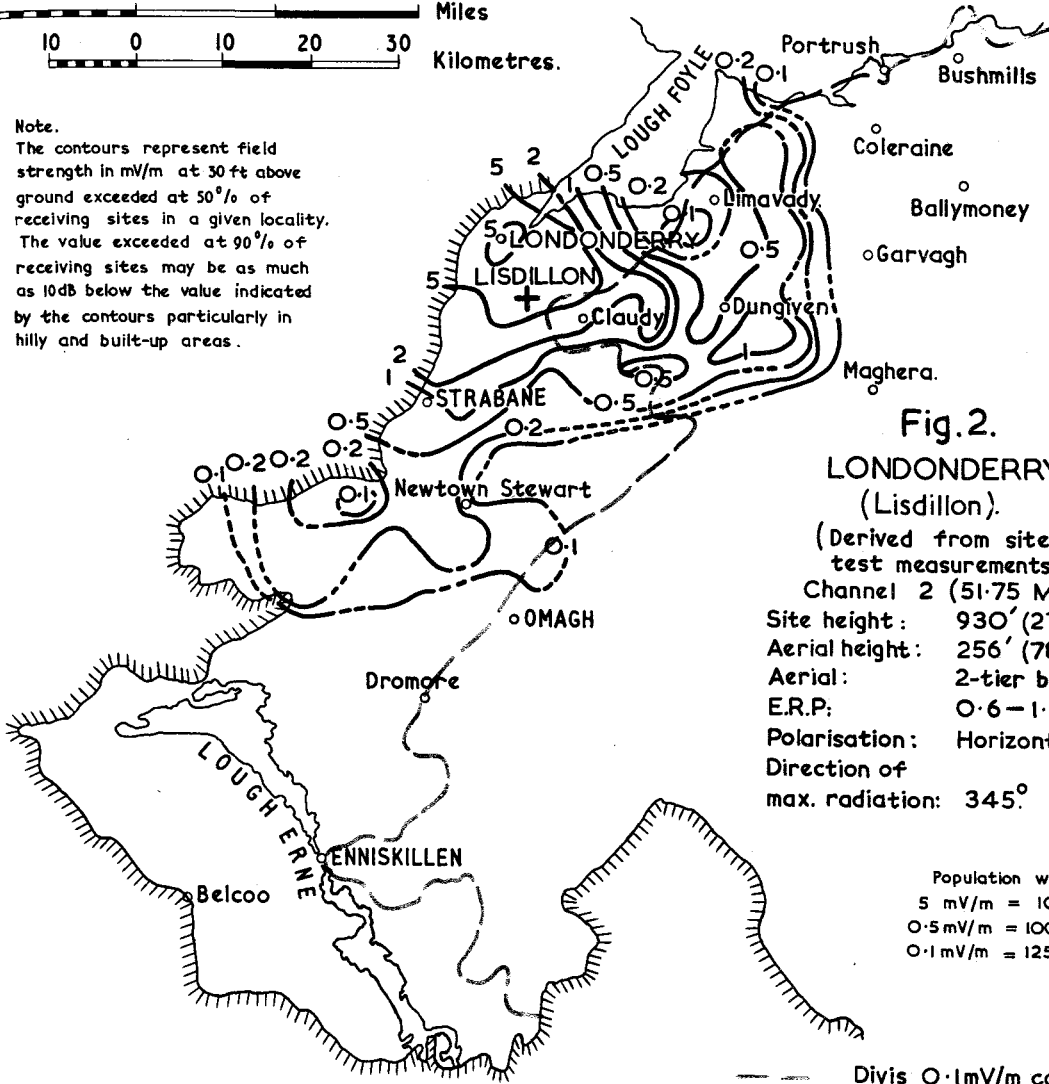
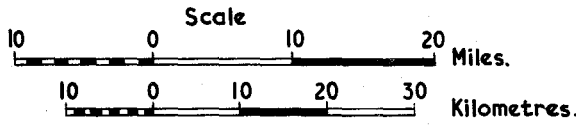


Fig. 2.
 LONDONDERRY.
 (Lis Dillon).
 (Derived from site test measurements).

Channel 2 (51.75 Mc/s).
 Site height : 930' (273m)(a.m.s.l).
 Aerial height : 256' (78m)(a.g.l).
 Aerial : 2-tier batwing-V
 E.R.P. : 0.6-1.5kW.
 Polarisation : Horizontal.
 Direction of max. radiation : 345°

Population within
 5 mV/m = 10,500.
 0.5 mV/m = 100,300.
 0.1 mV/m = 125,000.

— — — Divis 0.1mV/m contour.



Note.
 The contours represent field strength in mV/m at 30ft above ground exceeded at 50% of receiving sites in a given locality. The value exceeded at 90% of receiving sites may be as much as 10dB below the value indicated by the contours particularly in hilly and built-up areas.

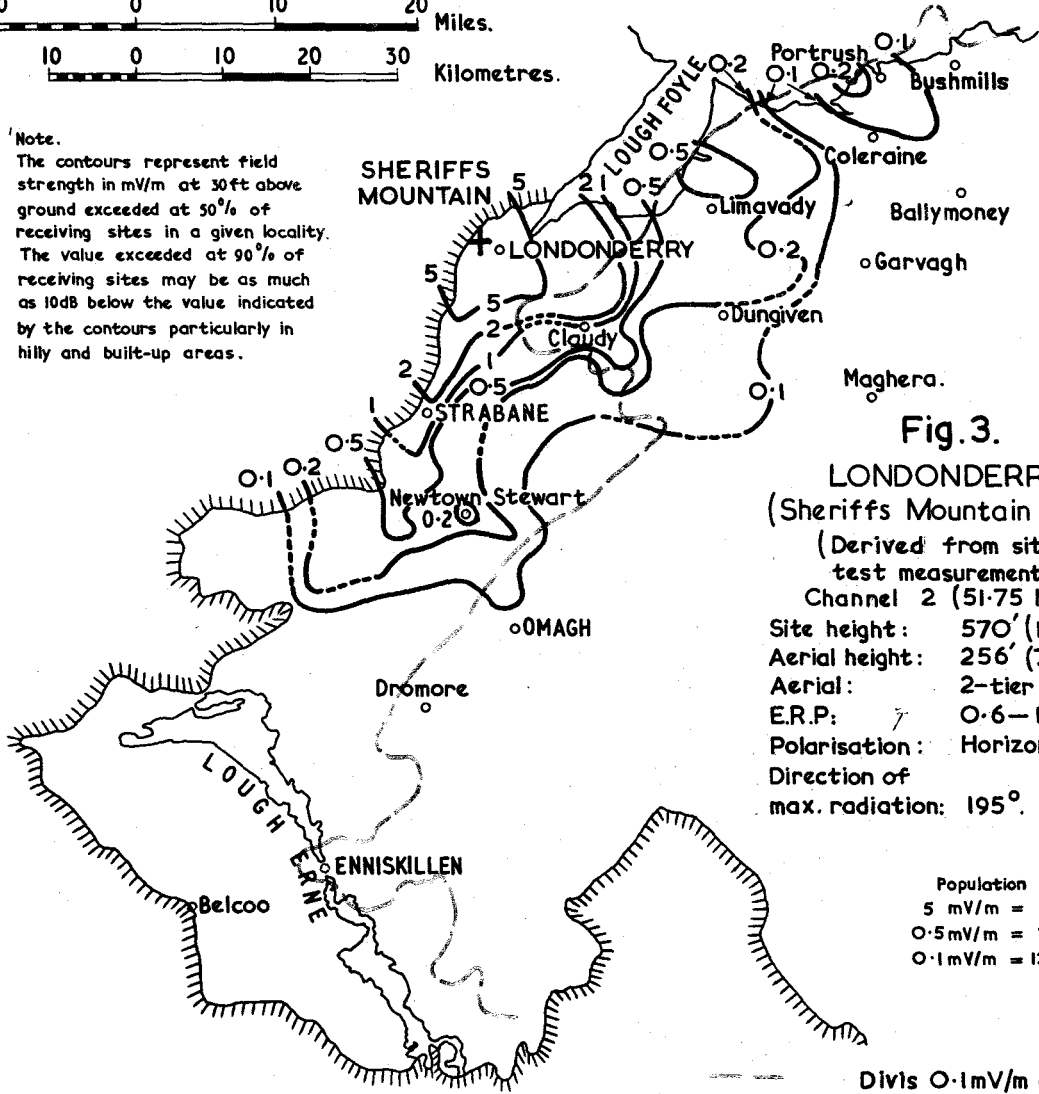


Fig. 3.
LONDONDERRY.
 (Sheriffs Mountain site).
 (Derived from site test measurements)
 Channel 2 (51.75 Mc/s).
 Site height: 570' (173m)(a.m.s.l).
 Aerial height: 256' (78m)(a.g.l).
 Aerial: 2-tier batwing-V
 E.R.P.: 0.6-1.5kW.
 Polarisation: Horizontal.
 Direction of max. radiation: 195°.

Population within
 5 mV/m = 57,100.
 0.5 mV/m = 79,700.
 0.1 mV/m = 137,200.

--- 0.1mV/m contour

The table shows that, with the exceptions of Omagh, Coleraine and Dungiven, all the principal towns are better served by Sheriffs Mountain and, of these exceptions, Omagh and Coleraine are better served by Divis than by either of the sites tested. Dungiven is, therefore, the only town that is best served by Lisdillon.

Table 2, compiled by Engineering Information Department, gives the estimated population within the 5 mV/m, 0.5 mV/m and 0.1 mV/m contours for both sites.

TABLE 2

| Field Strength mV/m | Sheriffs Mountain | Lisdillon |
|------------------------|-------------------|-----------|
| 5.0 | 57,100 | 10,500 |
| 0.5 | 79,700 | 100,300 |
| 0.1 | 137,200 | 125,000 |

It is noted that the population within the 0.5 mV/m contour for Lisdillon is greater than that for Sheriffs Mountain. Nevertheless, Sheriffs Mountain gives the better overall coverage and provides the towns of Portstewart and Portrush, which are outside the service area of Lisdillon and Divis, with median field strengths of 0.24 mV/m and 0.13 mV/m respectively. Fig. 3 shows that all the principal towns in the west of Northern Ireland, except Enniskillen, will receive a field strength of not less than 0.1 mV/m from either Divis or Sheriffs Mountain.

As the work in Northern Ireland was almost completed before Divis came into service the reception tests were of a restricted nature. They indicated, however, that with a high receiving aerial a median field strength of about 0.3 mV/m may be expected at Sheriffs Mountain. The distance between Divis and Sheriffs Mountain is 62 miles (100 km) and some variability of the signal should therefore be expected with occasional deep fades.

3. CONCLUSIONS.

The tests show that Sheriffs Mountain is the better of the two sites investigated. It is therefore recommended that this site be selected for the television transmitter to serve Londonderry and the north-west of Northern Ireland.

Reception tests indicate that Divis may be expected to provide a fairly reliable signal at this site for R.B.R. purposes.

APPENDIX

Sheriffs Mountain

Position: 1½ miles (2.4 km) W.N.W. of Londonderry
Latitude: 55° 00' 08" N
Longitude: 07° 22' 10" W
Site Height: 570 ft (173 m) AMSL

Lisdillon

Position: 4½ miles (7.2 km) S.S.E. of Londonderry
Latitude: 54° 55' 43" N
Longitude: 07° 18' 00" W
Site Height: 930 ft (273 m) AMSL