

# The Effect of Trees on Television Reception

Arboriculture Research Note, ref 146/98/TV, issued by the Arboricultural Advisory & Information Service. This edition was produced by BBC Reception Advice for use on-line on their web site and is a word for word version of the original note **The Effect of Trees on Television Reception** by the BBC and ITC Engineering Information Departments and the Confederation of Aerial Industries.

## Abstract

**Trees can have a serious effect on television reception. The effect can be reduced or avoided by careful species selection and siting of new trees. Where established trees cause a problem the choice and siting of aerials may provide an acceptable solution.**

## Introduction

1. Many Local Authorities, local amenity and conservation societies and householders are planting trees which, if carefully positioned, can enhance an area. However, few people are aware of the effect trees can have on the reception of television broadcasts - particularly those using analogue systems. All UK terrestrial television services are transmitted in the UHF (Ultra High Frequency) band, on frequencies between 470 and 854 Megahertz (MHz) on Channels 21-68. The greatest effect of trees tends to be on the higher frequencies, that is on channels 39-68. Television broadcasts via space satellites are increasing. Reception from satellites depends even more on a clear line-of-sight.

## Effects of tree types

2. Evergreen trees have more effect on television signals than deciduous trees, and experience suggests that coniferous trees are worse than broad-leaved evergreens. In winter, when deciduous trees are bare, they have very little effect compared with summer when the same trees are in full leaf. During wet weather, when covered in moisture, all trees can have an appreciable effect on signals. As trees sway in windy weather the screening effect varies, leading to fluctuations in the quality of reception.

## 'Shadowing'

3. UHF transmissions closely resemble those of light waves. As with light, objects such as hills, buildings, or tall trees can obstruct or deflect the UHF signals, creating deep shadow patterns in which reception is difficult. The screening effect of trees has a further disadvantage in that it can vary greatly with the season and weather conditions, and is especially important in areas where television signals are weak. In strong signal areas, it is often possible to accept some attenuation from trees and still obtain a satisfactory picture.

## 'Ghosting'

4. If the television signal is reflected from buildings or trees in such a way that the reflected signal arrives appreciably later than the direct signal, the effect is to produce a delayed image or 'ghost' on the screen. If the reflection comes from a wooded hillside, it can produce multiple images, which will be continually changing as the trees move in the wind. The use of specialist aerials, such as Log Periodic aerials, may help to resolve some problems.

## Amelioration of existing problems

5. When the surrounding trees are below the level of the rooftop, there should be no problem, provided that an adequate roof-mounted UHF aerial of the correct type is used. Where trees are above the level of the rooftop it may be necessary to install aerials so that they are above the trees. This can sometimes be achieved by mounting the aerial on a pole attached to the chimney stack or by using a remote aerial clear of the trees. The problem is more difficult for people who live in single-storey houses. However, it is sometimes possible to site a receiving aerial so that it is below the main branches of the trees. If there are no other obstructions at low level, then satisfactory reception may result. When deciding the height of an aerial, allowance should be made for growth of the tree (note 1)

6. If the aerial cannot be mounted above the tops of the trees, the signal will inevitably be weakened in passing through the trees. This is not necessarily disastrous but it may involve the use of a high-gain aerial, possibly with a masthead amplifier. In any case it is desirable to use a good quality low-loss feeder to connect the aerial to the receiver, and it will often be advantageous to try an alternative position for the aerial - on a different chimney stack for instance.

7. If the trouble is due to ghosting rather than attenuation of the signal, the directivity of the aerial becomes important. A high-gain aerial is usually also highly directional but some types of aerial, such as the Log Periodic type, have very good directional properties but are not high-gain.

8. Viewers should contact their local television dealer, or a reputable aerial contractor, and take care that the aerial is adequately supported. If the obstruction is caused by trees on a hill which is so far from the viewer's house that the above suggestions are impracticable, the only way of solving the problem, although undesirable, may be to remove those parts of the trees which are obstructing the signal, or even to fell the trees. Where trees are subject to statutory control (Note 2) permission should be obtained or the appropriate notice given. Common law precedents should also be observed (see Dobson and Patch 1998)

### **Satellite Broadcasting**

9. Satellite broadcasting of television and radio, directly to private homes, has become common place. A General Planning Consent (Note 3) has been given for small dish aerials to be located on private dwellings, subject to constraints on size and siting.

10. Satellite transmissions use frequencies in the 11 and 12 Gigahertz (GHz) bands. At these high frequencies (up to 20 times greater than UHF broadcasts) the power of the received signals is low. The signals are completely blocked by any obstruction such as trees. In siting the receiving "dish" an allowance must be made for movement of trees in a wind and for future growth of the trees. Loss of signal caused by trees will require relocation of the "dish", pruning or in extremis removal of the tree. However permission should be obtained or the appropriate notice given where trees are the subject of statutory control (Note 2).

11. Several satellites in geostationary orbit are 'visible' from the UK; of these the ASTRA satellites attract the biggest audience. "Dishes" need to be aimed at about 30° East of South and between 17 and 30° above the horizon, depending on the latitude of the receiving site. Other satellites will be on different bearings but at a similar angle above the horizon.

### **Digital Television**

12. Any problem with Digital Television, both satellite and 'through the aerial' are likely to be almost impossible to diagnose from inspection of the pictures. This is because Digital Television either gives perfect pictures or none at all. There is a very narrow area between these states where intermittent frozen pictures or a square 'blocking' effect may be observed. The cause may be a weak signal or conditions that lead to ghosting on analogue television.

13. However on the whole Digital Television is more immune to the conditions that cause ghosting but it is not more immune to weak signals. Professionals installing Digital Television receiving equipment or aerials for Digital Television should use special instruments, which will enable them to measure that the signal is above the minimum required to get pictures.

14. In the case of 'through the aerial' problems, it will be worthwhile to inspect the analogue pictures for the problems described earlier. There is no such guide for picture problems with Digital Satellite Broadcasts.

### **TV reception and the Law**

15. The TV licence is a permit to operate a television receiver, it does not guarantee any reception and it therefore follows that there is no legal right to reception. There are no court precedents in respect of trees interfering with TV reception. It seems likely that existing trees on neighbouring land which interfere with television reception, especially with satellite transmissions, are unlikely to be regarded as a "nuisance" in law. Any remedial work, therefore, should be by agreement with the tree owner and within the statutory controls (Note 2).

## Avoidance of problems

**16.** When planning to plant trees, it is advisable to consider the effects of spacing and the anticipated mature heights of the trees to be planted (Note 1). However, the problem is not always easy to identify in the short-term. The effects will change not only over the season but also gradually over a period of years as growth occurs and trees mature. The signal path from a transmitting station is not readily apparent from a receiving site, and, to be accurate, detailed profiles may have to be produced. Arboriculturists and landscape-architects wanting specialist advice about the possible effect of trees on television reception at a particular location, should write with the fullest possible details to one of:

BBC Reception Advice  
Television Centre  
Wood Lane  
London  
W12 7RJ  
Tel: 0870 0100 123 (national call rate)  
Office open 09:00 - 18:00 Monday - Friday

ITC Engineering Policy  
Kingsworthy Court  
Kingsworthy  
Winchester  
SO23 7QA  
Tel: (01962) 848647

## Related reading

Dobson M and Patch D (1998) Trees in Dispute, Arboricultural Practice Note 3, Arboricultural Advisory and Information Service, Farnham.

Published December 1998 by:  
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*The Arboricultural Advisory and Information Service provides advice and information about trees based on research results and experience, both national and international, to arboriculturists, landscape architects, the construction industry and other professionals, also to private individuals. The service is funded by the Department of the Environment and operated by the Forestry Authority.*

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## Footnotes:

- 1.Arboriculture Research Note 84.
- 2.Tree Preservation Orders, Felling Licences and Conservation Areas.
- 3.Town and Country General Development Order 1988 Parts 1 and Schedule 2.