

My name is Robert Schoenfeld. I have worked in the telecommunications field for over 40 years. During that period, I have also continuously held both an amateur radio license and a commercial radiotelephone license (see details at end of comments). Professionally I have worked for major carriers such as MCI and Cablevision, and also end users on station terminal equipment, cable plants, and carrier equipment from simple station carrier up to SONET systems. I have also written articles and given talks and seminars on carrier and switching systems.

1) A Short History of Power Line Carrier

Power Line Carrier was developed in the 1930's as a simple solution to cover sparse rural areas with telephone service without building an expensive cable system. It was engineered to have a maximum capacity of 24 channels and operated at frequencies of under 300 KHz. Each channel had a bandwidth of 300 to 3600 KHz and each channel used either 4Khz (Single Side Band) or 8 KHz (amplitude modulation). The pilot frequencies were in the order of 1-200 KHZ (wave length of over 1000 meters). At these frequencies, even though the high tension wire is 40 or more feet in the air the spacing to ground is a small fraction of the actual wave length (less than 1%) and the power line and ground acts just like a transmission line and keeps the radiation close to the line without very strong external radiation.

2) Current Wide Band Systems

Rather than working at very low frequencies as systems have in the past, the new wide band systems use the frequencies of 3 – 30 MHz. At these frequencies, the high tension wires are at a large fraction of wave length (from about $\frac{1}{4}$ at 3 MHz to full wave length at 30 MHz. To the signal this looks like an antenna, not a transmission line and would radiate the signal rather than carry it.

3) Users of the 3- 30 MHZ spectrum

There are four major groups that would be affected by the high power output of these systems in the US

A. Mobile and Base Systems

Most of those left in the 3 –30 MHz area are Police and Fire Departments which are concentrated in the 25-30 MHZ region. They generally use highways that have power lines parallel to them. Power Companies and highway repair departments are also included in this segment.

B. Amateur Radio Operators, Class D Citizen Band Systems and Short Wave Listeners

These users particularly listen to very weak signals. Some amateurs even use extreme low power (QRP) of under 2 watts (30 to 60 DBm) output transmitters. Since the signal goes

an extremely long distance in some cases (greater than 10,000 miles) the received signal is extreme low (See the ARRL reply by Ed Hare WIRFI and its references to studies by the Japan Amateur Radio League and the Radio Society of Great Britain to this notice). Also under part 97 of the Commission's rules, one of the reasons for the existence of Amateur radio is promoting international understanding. Another is the experiments that Amateurs undertake, including attempts to communicate at the least power possible as also written in part 97. Both of these worthwhile endeavors would not be available to amateurs where power line carrier systems as proposed are in operation. Shortwave listeners also would not be able to listen to among other things lower power international broadcasters. Commercial CB users would have the range of their systems even from the legal power limitation of 5 watts (about 50DBm).

C. Military

The Army and Marines use these frequencies on convoy or in exercises in the Continental United States and might have major problems when such systems are in use in areas that they conducting such exercises.

D. MARS and CAP

The Military Affiliate Radio System (MARS) and the Civil Air Patrol (CAP) also use these frequencies. MARS particularly uses frequencies adjacent to the amateur bands and amateurs are the MARS operators usually. The same problems apply to these services as amateurs

E. Aviation and Marine

Long distance flights and marine emergency services are also in the 3 –30 MHZ region and shore stations near such systems would have rough times receiving emergency and routine communications from them.

4) Conclusions

The Commission should not allow wide band power line carrier systems except in rural area and where underground distribution is used in urban and suburban area

Robert Schoenfeld
1989 North Jerusalem Road
East Meadow NY 11554
516 483 2666
Amateur Call WA2AQQ (Extra Class) Licensed continuously since July 1958
General Radiotelephone Operators License with Ship Radar Endorsement PG-2-22663
since 1955