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Society of Cable and Telecommunications Engineers
Interface Practices Subcommittee
WG5, IPS SP 910 RFoG System

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Institute of Electrical and Electronics Engineers
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Gentlemen:

We are writing to you to correspond about the development of a new set of specifications for all-fiber access networks in Broadband Communications Networks using RF signals over glass, also known as "RFoG". Participants in this effort include equipment vendors, some of whom already offer RF-based optical access solutions, and service providers interested in how RFoG would be deployed as part of a residential and commercial services network solution. This ongoing work is taking place in SCTE's Interface Practices Subcommittee and is assigned to Working Group 5 (Fiber Optics). Of key interest is the wavelength plan that will be used in RFoG. As we will explain in more detail below, there is a desire to coordinate our wavelength plan with that of the IEEE's Gigabit EPON and developing 10G EPON wavelength plans, in order to ensure the greatest possible flexibility for service providers deploying either or both solutions (RFoG and G/10G EPON), potentially on the same optical fibers.

RFoG will provide a means for service providers to deliver communication services to commercial and residential subscribers using an all-fiber access

network. At the heart of the specification is the ability to use a two-way RF-based transmission that leverages the transport technologies operating in hybrid-fiber coax (HFC) networks now. This affords service providers an all-fiber access solution that is compatible with and interfaces with existing headend and customer premise equipment, as well as existing back office systems used for provisioning, billing and the like.

For downstream transmission in the RFoG solution, we plan to use the 1550 nm wavelength (1540 to 1560 nm) that is already being used for RF overlays in PON systems. Using 1550 nm as the downstream wavelength should not interfere or overlap with other PON technologies.

We are considering several options for the upstream wavelength, including 1590 nm (1580-1600 nm) and 1610 nm (1600-1620 nm). We understand that you are considering 1577 nm (1574-1580 nm) and 1590 nm (1580 – 1600 nm) for downstream in the 10 Gbps EPON specification. We also understand that the IEEE may select just the 1577 nm wavelength for the 10 Gbps downstream, thus freeing up the 1590 nm wavelength.

The following chart summarizes our understanding of the wavelength plans as currently in use or proposed:

Nominal Wavelength (nm)	Application
1270	IEEE 802.3av 10G Upstream (1260-1280) Upstream PHY FUTURE HOLD
1310	IEEE 802.3ah and ITU G.984 (1260-1360) Upstream PHY
1490	IEEE 802.3ah and ITU G.984 (1480-1500) Downstream PHY
1550	Reserved for RF Video Overlay, (1540-1560)
1577	IEEE P802.3av PR(X)30 (1574-1580) Downstream PHY
1590	IEEE P802.3av PR(X)10, 20 (1580-1600) Downstream PHY
1610	Not Reserved

We would like to accomplish two things through liaison and regular correspondence between our appropriate working groups. First, we would like to better understand your wavelength plans, and in particular whether you will use 1590 nm. If you move to using 1577 nm, would that apply to all three power budget levels – PR(X)10, PR(X)20 and PR(X)30? Second, we would like to coordinate the selection of our RFoG upstream wavelength with

your wavelength plan, to preclude use of the same wavelength(s) in our respective specifications, thus paving the way for network operators to leverage either or both technologies to best serve their customers.

One of the issues of concern is that we seem to be moving toward wavelengths that are close together in the 1590 nm region, IEEE 802.3av for downstream and RFoG for upstream. This raises filtering issues of concern where both systems are operated on a common PON.

We, the members of WG5, believe that coordinating our wavelength plans will be beneficial for both of our memberships and will encourage adoption of the technologies we both represent, as well as optical access in general. Today, MSOs have deployed millions of set top boxes, modems and voice adapters that use two-way RF signaling. RFoG offers all-fiber access compatible with these devices as well as with headend gear. Longer term strategic interests, such as increased data rates and commercial services can be addressed with equipment from both solution sets. A coordinated wavelength plan can be an enabler for these technologies which will ultimately benefit service providers, residential and commercial subscribers, and equipment vendors.

We look forward to working together in this effort and hope that you will find this cooperative approach beneficial, as well. We normally conduct quarterly meetings, but will be having interim calls every 30-60 days to better facilitate the evolution of our specification. Please advise us of any questions you might have and how we can further assist. Perhaps we could set up a brief phone conference to answer questions and review your thoughts on this proposal.

Sincerely,

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