

**IEEE 802.4L
THROUGH-THE-AIR TOKEN BUS PHYSICAL LAYER
Minutes of interim and regular meetings of IEEE 802.4L
on November 9 and 12 on 0830
at the Embassy Suites Hotel, Ft. Lauderdale, Florida**

NOV. 9--OPENING MATTERS

The meeting was opened by Chairman, David Greenstein, announcing that the purpose of this meeting was technical discussion generally following the agenda in the announcement mailed to all those on the membership and interest list. Business matters would be deferred until the regular meeting on November 12. The attendance list for this meeting showed 12 names.

OPTICAL VS. RADIO

The Chairman asked for an expression of preference for radio or optics. No advocate of an optical solution was present. Therefore, further discussion would be concerned with radio solutions. Optics is not excluded.

FCC NOTICE OF PROPOSED RULEMAKING FOR PART 15

The Chair asked C. A. Rypinski to start the technical discussion. He called the attention of the group to a recent FCC document (GEN Docket No. 87-389, released Oct. 2, 1987) detailing proposed changes in FCC Rules, Part 15, for intentional, low-power communication by unlicensed but certified equipments in the frequency bands 902-928, 2400-2483.5 and 5725-5875 MHz bands. Rypinski emphasized that these presently available bands were non-exclusive, but that they were certainly usable for developmental work.

A summary of the proposed changes covering the entire radio spectrum was described in a NEWS RELEASE (DA 87-1327 released: Oct 2, 1987), was also presented. A copy of DA 87-1327 has been numbered 802.4L/87-019, and will be distributed with these minutes.

Rypinski expressed an opinion that while the rules as written call for frequency hopping or direct sequence spread spectrum at a power level of 1 watt (or the equivalent field strength), it would be possible for the FCC to accept other narrower band modulations provided that the energy density or interfering effect was not greater than those of the allowed systems.

It might be desirable for this group to comment on these rules, but the closing date for comments was not known.

MODEL FOR SYSTEM PLAN

Rypinski showed a slide for a basic system plan with a 4x4 grid of 16 fixed radio illumination sites each connected to a port on a common control then bridged to an 802.4 LAN backbone. Each site was labeled progressively for frequencies 1 to 4. He explained that at any one transmission only one set of four transmitters would come ON to communicate with a particular mobile of approximately known location. The location would be known to the central controller from receiving measurements made at the last circulation of the token.

The token on the radio system is independent of the token on the backbone. The spacing between points on the grid is presumed to be 300 feet or less. The plan shown could cover more than 800,000 square feet.

MACRO AND MICRO DIVERSITY

Rypinski asserted that in the fixed mobile direction order 4 redundant transmission was an efficient way to reduce bit-error rate to acceptable magnitudes, and this was an important part of the system plan. The level of this redundancy is a factor in determining spectrum utilization.

"ALL SITES MUST TRANSMIT TO MEET REQUIREMENT FOR BUS MODE OPERATION"

Bob Douglas raised the objection that by definition, the 802.4 access protocol depended upon all stations being able to hear the transmission from any other--particularly for the SOLICIT SUCCESSOR function. The radio system must then operate in a repeater mode where a transmission received at one or more sites is immediately rebroadcast on all sites.

Rypinski responded that radio systems become spectrally and economically inefficient if made to transmit redundantly where there is no listener. He agreed that under some conditions all or consecutive groups might need to transmit when the location of the receiving station or when a broadcast/multiple address transmission was needed.

If true bus mode operation is required with interference limited system design, then more than 4 separate frequencies are necessary--9 or 16 for continuous patterns of sites all transmitting simultaneously according to Rypinski.

It was agreed that system plans meeting Douglas' requirement for all transmitters simultaneously sending the same message should be proposed and considered in detail.

OTHER DISCUSSION

Further consideration of system design with all transmitters ON led to discussions of cellular frequency reuse design, fading, distance function in signal level and other propagation factors.

NEXT MEETING

After some discussion, a tentative date for an interim meeting was set to be confirmed at the regular meeting on Nov 12. The time and place are:

**February 2, 1988 (Tuesday), 0830
O'Hare Hilton Hotel--Chicago O'Hare Airport**

The meeting was adjourned shortly after noon.

NOV. 12--OPENING MATTERS

David Greenstein opened the meeting shortly after 0830. The small attendance (6 persons) was attributed to conflicting meeting time with other 802.4 activities.

The minutes of the last meeting (802.4L\87-015) distributed by mail were approved.

The next interim meeting of 802.4L shown above was confirmed. The Chairman noted that a minimum of 6 persons had to be present for a quorum, and that the meeting could be cancelled if there were not an advance indication of at least this level of attendance.

TECHNICAL DISCUSSIONS

The subjects and issues of the first meeting were further discussed. The need for drawings of candidate system models appeared necessary. No conclusions were reached other than that the grid model arranged to permit simultaneous activation of all site transmitters was suitable for the present.

The meeting was adjourned near noon.

Respectfully submitted,

Chandos A. Rypinski, Vice Chairman and Secretary

IEEE 802.4L THROUGH-THE-AIR TOKEN BUS PHYSICAL LAYER Document and Submission List--IEEE 802.4L

<u>Number</u>	<u>Description</u>	<u>Date</u>
802.4L/ 87-000	Document and Submission List	87-04-01
87-001	OBJECTIVES FOR 802.4L--Through-the-Air Token Bus Physical Layer--DRAFT-Proposal (C. Rypinski)	86-11-26
87-002	MEMORANDUM--TO: D. Greenstein & Members 802.4L. RE: Plenary Meeting of CCIR IWP 8/13, March 10-18; Melbourne, Australia; Future International Public Mobile Digital Radio Telephone Service. (C. Rypinski)	87-03-22
87-003	MINUTES of the meeting of IEEE 802.4L on November 20, 1986; Cardiff Room, Hotel Del Coronado, San Diego, CA. (Submitted. Not approved or accepted--C. Rypinski)	86-11-24
87-004	DETAIL SUPPLEMENT TO OBJECTIVES FOR 802.4L--Proposals for Radio Only. (C. Rypinski)	86-11-26
87-005	CHARTER AND OBJECTIVES--IEEE 802.4L--THROUGH-THE-AIR TOKEN BUS PHYSICAL LAYER (Revision of -001 and -004 at meeting of March 24)	87-03-31
Items below were offered as submissions at the meeting of July 16, 1987		
87-006	MINUTES of the meeting of IEEE 802.4L on March 24, 1987; Hotel Royal Orleans, New Orleans, LA. (C. Rypinski)	87-04-01
87-007	FCC RULES AND POSSIBLE LAN OPERATING FREQUENCIES (C. Rypinski)	87-07-08
87-008	SYSTEM PLAN, WIRELESS LAN--BUS MODE 1.6 MBS, SPREAD SPECTRUM, 2400-2483.5 MHZ,...(C. Rypinski)	87-07-08
87-009	SYSTEM PLAN, WIRELESS LAN--BUS MODE 3.2 MBS, SPREAD SPECTRUM, 1850-1990 MHZ.....(C. Rypinski)	87-07-08
87-010	DRAFT OF PREPARATION FOR COUNSEL, PETITION FOR RULE MAKING, INDUSTRIAL WIRELESS AUTOMATION SERVICE, (C. Rypinski)	87-07-08
87-011	SYSTEM PLAN, WIRELESS LAN--BUS MODE, 2 MBS, 1700-1710 OR 2150-2160 MHZ.....(C. Rypinski)	87-07-09
87-012	MEMO from T. Saito, NEC, Investigation of possible optical systems; "ATMOSPHERIC LASER COMMUNICATIONS EQUIPMENT (LE-9102 T/R)," NEC R&D Journal	87-07-16
87-013	FCC Docket No. 81-413, "In the Matter of AUTHORIZATION OF SPREAD SPECTRUM AND OTHER WIDEBAND EMISSIONS NOT PRESENTLY PROVIDED FOR IN THE FCC RULES AND REGULATIONS," May 9, 1985 (R. Formeister)	87-07-16
Items below were distributed by mail to list August, 1987		
87-014	PROJECT AUTHORIZATION FOR 802.4L--Passed by IEEE 802 Executive Committee, July 16, 1987	87-07-16
87-015	MINUTES of Meeting of July 16, Report on 802.4L Matters at the 802.4 Plenary and 802 Executive Committee, and Current Document List. (C. Rypinski, R. Matthews)	87-08-14
Items below were submitted to or distributed after meeting of November 12, 1987		
87-016	Submission "C&C NET STAR2800," optical fixed point network with 4 links of 2 x 64 kbs, Mr. K. Takumi and Mr. T. Saito, NEC.	87-11-12
87-017	"SUMMARY OF PROPOSED CHANGES TO PART 15 OF THE REGULATIONS," Federal Communications Commission News Release DA 87-1327 of Oct 2, 1987	
87-018	MINUTES of Meetings of November 9 and 12 with attached current Document List and Membership and Interest List.	87-11-14

November 16, 1987

-4-

DOC: 802.4L/87-018

MAILING and INTEREST LIST - IEEE 802.4L - NOVEMBER 12, 1987

Mr. DAVID GREENSTEIN, Chmn 802.4L General Motors Technical Center Manufacturing Building B/MD-39 Warren, MI 48090-9040	313 947 0571	Mr. FRANK T. CHEN Tandem Computers, Inc 10501 N. Tantau Driver Cupertino, CA 95014	408 865 4194
Mr. CHANDOS RYPINSKI Consultant-Secretary 802.4L 130 Stewart Drive Tiburon, CA 94920	415 435 0642	Dr. NARAYAN MURTHY Tandem Computers, Inc 10501 N. Tantau Driver Cupertino, CA 95014	408 865 4281
Mr. CHARLES THURWACHTER Industrial Technology Institute Communications Network Laboratory POB 1485 Ann Arbor, MI 48106	313 769 4292	Mr. ARIEL HENDEL Standard Microsystems Corporation New Product Development 35 Marcus Blvd Hauppauge, NY 11788	516 273 3100
Mr. PAUL EASTMAN, Chmn 802.4 Fairchild Data Corporation 350 No. Hayden Road Scottsdale, AZ 85257	602 941 0023	Mr. MICHAEL A. BUSH Allen-Bradley Industrial Computer Group 555 Briarwood Circle Ann Arbor, MI 48104	313 668 2500
Mr. RICHARD FORMEISTER Fairchild Data Corporation 350 No. Hayden Road Scottsdale, AZ 85257	602 949 1155	Mr. MICHAEL T. KLEIN Allen-Bradley Industrial Computer Group 555 Briarwood Circle Ann Arbor, MI 48104	313 668 2500
Mr. ROBERT M. CULLEN CODEX Corporation 20 Cabot Blvd. Mansfield, MA 02048	617 364 2000	Mr. FRED P. RHINE Allen-Bradley Industrial Computer Group 555 Briarwood Circle Ann Arbor, MI 48104	313 668 2500
Dr. R. A. BRUCE Hughes Aircraft Co. Microelectronic Systems Division 2601 Campus Drive Irvine, CA 92715	714 752 3633	Mr. EDMUND LASOTA Eastman Kodak-CS&CT Kodak Park Division, Bldg 23 Rochester, NY 14650	716 477 1006
Mr. MAX ALLEN Motorola Inc. Communications Sector 1301 E. Algonquin Road Schaumburg, Illinois 60196	312 576 5924	Mr. MICHAEL F. BUKOWSKI General Motors Technical Center Manufacturing Bldg A/MD-39 Warren, MI 48090-9040	313 947 0588
Mr. CLYDE BOENKE American Broadband, Inc. POB 2144 Ann Arbor, MI 48106	313 761 8818	Mr. NABIL G. DAMOUNY Signetics Corp. M.S. 60 811 E. Arques Ave Sunnyvale, CA 94086	408 991 4544
Mr. RON MATTHEWS DEC 146 Main St., MLO5-2/E50 Maynard, MA 01754	617 493 6669	Mr. MICHAEL MASLEID Inland Steel Co. MS2-465 3210 Watling St. East Chicago, IN 46312	219 392 4411
Mr. HOWARD GAGE Tandem Computers, Inc 2550 Walsh Ave Santa Clara, CA 95051	408 748 2154	Mr. LEONARD KOSMEVOY Intel Corp. MS/HF3-61 5200 NE Elam Young Pkwy Hillsboro, OR 97124	503 696 5755
Mr. JIM SANDERS Tandem Computers, Inc 2550 Walsh Ave Santa Clara, CA 95051	408 748 2903	Dr. D. R. VAMAN Dept. of EEECS Stevens Institute of Technology Castle Point, Hoboken, NJ 07030	201 420 5849

November 16, 1987

-5-

DOC: 802.4L/87-018

MAILING and INTEREST LIST - IEEE 802.4L - NOVEMBER 12, 1987

Mr. ROBERT DOUGLAS 13850 No. Coral Gables Phoenix, AZ 85029	602 375 8806	Mr. DITTMAR JANETZKY SIEMENS AG P. O. Box 21 1080 D-7500 KARLSRUHE 21, F. R. GERMANY	(721) 595 4080
Mr. JOSEPH GREANEY LANEX 10727 Tucker St. Beltsville, MD 20075	301 595 4700	Mr. CEES J. M. LANTING Hewlett Packard Grenoble Networks Division 5, Avenue Raymond-Chanas 38320 EYBENS, FRANCE	33 76 62 57 27
Mr. B. SILVERMAN LANEX 10727 Tucker St. Beltsville, MD 20075	301 595 4700	Mr. M. H. CALLENDAR Chairman, IWP 8/13 (CCIR) British Columbia Telephone Co.-10th floor 3777 Kingsway Burnaby, BC, V5H 3Z7, CANADA	604 432 4616
Mr. TOM PHINNEY Honeywell Europe (Brussels) Process Automation Center P. O. Box 37107 Phoenix, AZ 85069	32 2 640 3321		
Mr. KENTA TAKUMI C & C Systems Development NEC Corporation 33-7, SHIBA 5 - CHOME, MINATO-KU TOKYO 108, JAPAN	(03) 453 5511		
Mr. YOSHIO SATO NEC America - Mobile Radio Division 4910 West Rosecrans Ave Hawthorne, CA 90250	213 973 2071		
Mr. TOSHIO SAITO 1st Development Dept, Transmission Division NEC Corp. 1753 SHIMONUMABE, NAKANARA-KU KAWASAKI, KANAGAWA, 211 JAPAN	(044) 433 1111		
Mr. HIROSHI ASO 1st Development Dept, Transmission Division NEC Corp. 1753 SHIMONUMABE, NAKANARA-KU KAWASAKI, KANAGAWA, 211 JAPAN	(044) 433 1111		
Mr. FUMIO AKASHI NEC Corporation-C&C Research Laboratory 1-1, MIYAZAKI 4-CHOME, MIYAMAE-KU, KAWASAKI, KANAGAWA 213, JAPAN	(044) 855 1111		
Mr. TOSHIO OGAWA YOKOGAWA ELECTRIC CORP Factory Automation Systems Division 2-9-32 NAKACHO, MUSASHINO-SHI TOKYO, 180 JAPAN	0422 55-0461		
Mr. JOHN REED Federal Communications Commission Room 7122, 2025 M Street NW Washington, DC 20554	202 653 7316		
Mr. ROBERT KILGORE Advanced Concepts Limited 18 Chilton Road Richmond, Surrey TW9 4JB, ENGLAND	(01) 940 3817		