The following reports of recent standards meetings represent the view of the reporter and are not official, authorized minutes of the meetings.


TR-45.3, TDMA Cellular Subcommittee, September 13 – 17, 1993, Calgary, Alberta

TR-45, Public 800 Standards Committee

TR-45.0.A, Ad Hoc Authentication Group

TR-45.3, TDMA Cellular Subcommittee

TR-45.3 WG2, Dual-Mode Standards

TR-45.3.2 Task Group 5, Circuit-Mode Data Services

TR-45.3 WG3, Digital Standards

TR-45.3.3 Task Group 1, Matrix

TR-45.3.3 Task Group 5, MS/BS Requirements

TR-45.3 WG5, Speech Codecs

TR-45.3 Plenary Roster, September 13 – 17, 1993, Calgary, Alberta

TR-45.2 Intersystem Operations Subcommittee, September 20 - 24, 1993, Walnut Creek, CA

TR-45.2 WG I, Message Encoding and Protocol Selection

TR-45.2.1 Task Group 1

TR-45.2 WG II

TR-45.2 WG III, Enhanced Handoff Requirements

TR-45.2 WG IV, Message Accounting

TR-45.2 WG V, Exceptional Transactions and Administrations Support

TR-45.2 WG VI, Int’l Applications of EIA/TIA 553 Related standards

TR-45.2 WG VII, PSTN/ISDN Interfaces

Roster of TR-45.2, September 20 - 24, 1993, Walnut Creek, CA

TR-45, Public 800 Standards Committee Plenary, September 24, 1993, Walnut Creek, CA

TR-45.4 Microcell/Microsystems Standards, September 27 – October 1, 1993, Tampa, Florida

Working Group I, PCS Services

Working Group II, A-Interface

Working Group III, Microcell/Microsystems Standards

Ad Hoc 800 MHz PCS Air Interface

TR-45.4 Meeting Roster, September 27 – October 1, 1993, Tampa, Florida

TR-29 Facsimile Systems and Equipment, October 18-22, 1993, Sunnyvale, CA

TR-29.1 Binary File Transfer

TR-29.2 Facsimile Digital Interface

TR-29.3, Audiographics Conferencing

TR-29.4 Secure Facsimile Committee Meeting

TR-29 Roster, October 18 – 21, 1993, Sunnyvale, California

Acronym Definitions

1994 Meeting Schedules as of October 27, 1993

1993 Meeting Schedules as of October 27, 1993
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REPORT OF ITU-T SG 15, TRANSMISSION SYSTEMS AND EQUIPMENT
WP 1, AUDIOVISUAL, SEPTEMBER 7 - 17, 1993, GENEVA, SWITZERLAND

SUMMARY

ITU-T SG 15 had its first meeting of the new study period in Geneva, September 7 - 17, 1993. Working Party 15/1 has been allocated four study questions (COM-15-1) covering the audiovisual field:

- Q1, Sound and vision broadcast equipment
- Q2, Visual telephone (videoconferencing and videotelephony)
- Q3, Harmonization of audiovisual (multimedia) systems
- Q6, Audio and wide band coding

COM 15-2 includes Resolution 1 (Rules of procedure and working methods) and Resolution 2 (Study Group responsibility and mandates).

Under Q2, two rapporteurs’ groups were established, covering ATM/LAN systems and PSTN videotelephony.

Four draft standards were “frozen”:
- Channel aggregation (H.AGG)
- Encryption key management (H.KEY)
- Data link layer (H.DLL)
- Far-end camera control (H.FECC)

A vote will be taken at the beginning of the next SG 15 meeting in May, 1994, as to whether these drafts should proceed to the final approval stage.

TD-76 is the preliminary WP 15/1 Meeting Report.

QUESTION 2: VIDEOCONFERENCING AND VIDEOTELEPHONY

ATM Video Coding

The experts’ group on ATM video coding, under the leadership of S. Okubo (NTT Japan), has continued in the interregnum period. TD-42 is their fifth progress report and a good overview of the work. The third draft of H.26X Generic Coding of Moving Pictures and Associated Audio (TD-39) was presented. This is to be submitted for Res. 1 in March, 1995. Since multiplexing and other systems aspects have inevitably become involved, and the pressure for multimedia over other types of LAN has been building up, it was found appropriate to extend the terms of reference (TD-74, Work Items) of this group accordingly. The July, 1993, working draft of MPEG 2 is contained in TD-37. There will continue to be strong coordination with the ISO MPEG 2 group; although the work will be technically aligned, it was agreed that common text would not be appropriate for systems work in the telecommunications environment.

Low Bit Rate Videotelephony

Concerning low bit rate videotelephony, the rapporteur (R. Schaphorst, Delta Information Systems, USA), assisted by many experts, had produced an excellent compendium of relevant technical information (TD-07). Terms of reference (TD-62) for the rapporteurship were agreed, including approval for two experts’ meetings (December, 1993, USA, and March, 1994, France). Two broad objectives were set: a near-term standardization in 1995 (H.VLC/N), based on currently available technology; then a more advanced scheme (H.VLC/L), backwards compatible but using newly emerging audio/video coding techniques, around 1998. It was considered essential to establish, in the very near future, a clear requirements statement for the system targeted; this will be done in cooperation with SG 1 (TD-61). Concerning audio coding, it was hoped that, for the 1995 objective, a scheme could be found which would give near toll quality for most calls but fall back to a lower rate under poorer transmission conditions.

Audio input levels to videoconference and videotelephony equipment currently lack standardization, causing interworking problems. All conversational systems, including telephony, should interwork (TD-03). It was agreed to seek a solution from SG 12 (TD-73).

QUESTION 3: HARMONIZATION OF AUDIOVISUAL SYSTEMS

The draft standard COM 15-39 for synchronized channel aggregation (H.AGG, H.22X) was finalized, as were COM 15-38, draft standards for encryption key management and authentication (H.KEY, H.234), and COM 15-
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31, far-end camera control (H.FECC) with revisions shown in TD-65. The next stage for these drafts is a vote in May, 1994, to go forward for correspondence approval.

A fourth draft standard, data link layer (H.DLL, TD-66), was also allowed to go forward after considerable discussion and the expression of reservations by some delegates. Essentially, the problem – expressed in D.126 (BT) – is one of potential duplication of standards, in that the so-called “MLP” being developed in SG 8 (T.120 series) has comprehensive functionality. A proposal was put forward during the meeting which appeared to offer the prospect of harmonizing the H.DLL and MLP schemes, both having Q.922 at the lowest layer, such that interworking would be possible and no equipment need implement both. It was felt that if this could be confirmed, then the fears expressed in D.126 could be allayed. The matter will be progressed by correspondence, seeking a clear solution within the next few weeks.

Concerning still-picture transmission using JPEG, the “profiles” proposed by the Tokyo rapporteur’s meeting in May, 1993, were adopted (D.78, Protocol for JPEG based Still Picture Transmission System); the precedence of SG 8 in determining a suitable protocol stack was accepted, but WP 15/1 stresses the urgency of finalisation, and the need to incorporate the profiles adopted.

There was general agreement to a proposal (COM 15-40, Norway) for V.24 emulation in the LSD channel; the desire here is the ability to attach a personal computer to a simple H.221-type terminal, no application being specified. Further consideration in detail will be given at the May, 1994, meeting.

There is concern that videophones, etc., without data capability should not be frozen (in video terms) out of multipoint calls while others are transmitting data. Proposals (D.36, USA; TD-04, Rapporteur) to do this by opening a “dummy” data channel are being progressed.

Numerous other clarifications and extensions to H.221/230/231/242/243/320 are under study; specific proposals will be put in white contributions to the May, 1994, meeting. Among these was a request from CCIR (TD-23) to provide the means whereby MPEG audio for broadcast purposes may be carried in multiple 64 kbit/s, multiple H0 channels, or H11/H12. Liaison to CCIR CMTT-C Q58 is WD-15. COM 15-29 (USA) proposes the integration of G3 facsimile with H.320 systems by utilizing a FaxPAD (G3 over X.25) like approach.

It is also hoped to revise H.233 (encryption) at the next meeting; apart from minor clarifications, the appendices should be removed, referring instead to the ISO-9979 register of algorithms. It was also thought valuable to describe procedures for the complete privacy process: call establishment, followed by key management and then in turn by activation of encryption. This process (TD-56) also will be appended to H.233.

The need for “continuous-presence” pictures in multipoint calls was recognized. A proposal (COM 15-22, USA) to multiplex four QCIF pictures was considered as interesting input, but other methods such as transcoding should also be considered (TD-43, S. Okubo, Chair of Experts Group for ATM Video Coding).

Concerning call control (D-channel) for multimedia systems, the output of the Tokyo rapporteur’s meeting (meeting report: TD-5) was approved. This includes treating AV.420 as a Report rather than a standard. This could be used as guidance by manufacturers and service providers concerning the SETUP and CONNECT messages to be used according to various combinations of network properties and user wishes. It was felt that a general HLC code point for Multimedia should be allocated by SG 11, and further service-specific HLCs avoided; liaison to SG 1 and SG 11 on this was drafted (WD-14).

It was agreed that it is useful to have a Table as contained in COM 15-24 (France) clarifying the use of BAS symbols attached to some Recommendations, however COM 15-24 needs further corrections and discussions.

WORKPLAN FOR VIDEO CONFERENCING, VIDEO TELEPHONY, AND MULTIMEDIA STANDARDIZATION

Taking into account the approaching maturity of the work on ATM/LAN video coding and systems, as well as extension of the existing recommendations for more generalized multimedia applications (mixed conversational/telematics), a workplan (TD-68) was prepared. It gives target dates for the various stages of each standard.

QUESTION 6: AUDIO AND WIDEBAND CODING FOR PUBLIC TELECOMMUNICATION NETWORKS

This is a new question (Rapporteur: R. Drogo De Iacovo, CSELT, Italy). Discussion was aimed at clarifying the objectives. These seem likely to fall into two categories, centered on a wideband speech coder (7 kHz band width), and an audio coder (15-20 kHz bandwidth). Various potential applications for each are listed in the meeting report.
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(TD-64), and contributions are being sought as to the technical requirements. ISO 11172-3 (third working draft)
compatible low bit rate multi-channel audio coding system and conventional stereo coding at lower sampling
frequencies (TD-38) was one approach considered. At this stage it is not known whether a unified approach is
feasible. A unified approach implies a single coding algorithm capable of working at a number of selectable bit rates
with different bandwidths and quality.

N. D. Kenyon, BT Research Labs

REPORT OF TR-45.3, TDMA CELLULAR SUBCOMMITTEE
SEPTEMBER 13 - 17, 1993, CALGARY, ALBERTA

TR-45, PUBLIC 800 STANDARDS COMMITTEE

TR-45 coordinates five subcommittees that develop standards for 800-MHz public mobile systems: TR-45.1
develops analog standards; TR-45.2 develops intersystem standards; TR-45.3 develops TDMA standards; TR-45.4
develops standards for microcell and personal communications systems (PCS); TR-45.5 develops CDMA standards.

TR-45 met on August 24, 1993. Due to a lack of quorum, TR-45 deferred all substantive decisions.

TR-45.1 REPORT

TR-45.1 has formed an ad hoc task group to investigate standardizing an 800 MHz PCS interface. The ad hoc group
will coordinate their work with TR-45.4.

TR-45.1 has adopted baseline text for IS-91 (PN-3188), a standard that combines AMPS, NAMPS, and
authentication. The proposed standard is now being verified and validated.

TR-45.2 REPORT

TR-45.2 is reviewing ballot replies for PN-2910, the TSB on border cells. The TSB requires a reballot due to
technically substantive changes.

PN-2754, the DMH (Data Message Handler) standard, is out for ballot.

PN-3098, a standard for A1 and D1 interfaces (cellular interfaces to the PSTN and ISDN) is being prepared for ballot.

IS-41-C, the intersystem operation standard, will go to ballot in 1994.

A TSB for CDMA intersystem operation should be balloted by October, 1993.

TR-45.2 has circulated, for comment, text for IS-53, Cellular Features Description.

Due to its workload, TR-45.2 requests TR-45.4 take over work on an A-interface standard. (The A interface is
located between the base station and mobile switching center.)

TR-45.5 REPORT

If TR-45.5 can agree on a new test plan, it will retest submitted speech codecs.

TSB-39, EXTENDED PROTOCOL ASSIGNMENTS, PN-3195

TR-45/93.08.24.08, Message Type Assignments for the Extended Protocol Facility of ANSI/EIA/TIA-553 and
EIA/TIA IS-54 (Editor, TSB-39), was deferred for lack of quorum. It proposes text for the latest revision of TSB-39.

As requested by GE, the text assigns additional message-type codes for the extended protocol.

OTHER HIGHLIGHTS

TR-45/93.08.24.03 (SW Bell) briefly describes Short Message Service and recommends that TR-45 approve
development of a such a service.

TR-45/93.08.24.04 (Motorola) recommends that TR-45.4 start development of stage-1 (user perspective)
requirements for the A interface.
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TR-45/93.08.24.07 is a copy of a letter to J. H. Quello (Chair, FCC) from G. H. Heilmeier (President, Bellcore) informing the FCC that Bellcore wants to transfer responsibility for the North American Numbering Plan to some other body.

CTIA has asked if TR-45 wants to participate in a CTIA standards project. The project will develop a cellular-antenna standard.

T1P1 has proposed changes to their charter. The changes would allow T1P1 to standardize radio interfaces. Also, oversight of the JTC (Joint Technical Committee) moves from T1E1 to T1P1.

E. Schimmel (VP, TIA) solicits member support for U.S. CCITT and CCIR efforts. So far, there has been minimal industry participation.

TR-45.0.A, Ad Hoc Authentication Group

Subject to the International Traffic in Arms Regulations (22 CFR 120 through 22 CFR 130), TR-45.0.A drafts procedures related to the overall security of cellular telecommunications systems. This includes methods and algorithms for authentication, encryption, and voice privacy. Much of the group’s material is only available to U.S. citizens, permanent legal residents of the U.S., Canadians, and others as authorized in an export license granted by the U.S. Department of State.

TDMA Systems

TR-45.0.A/93.08.26.02 (Motorola) proposes a synchronous cipher for use with the radio link protocol adopted by TR-45.3.2.5. The cipher uses an overflow count from the protocol’s frame counter to create an arbitrarily long cipher. TR-45.0.A deferred the contribution to allow time for review.

Other Highlights

TR-45.0.A met with the CTIA Fraud Working Group to present cellular authentication methods. Presentations covered authentication procedures in mobile stations, base stations, and home systems. The presentations also covered the associated air-interface and network signaling. As a result of the meeting, the CTIA Fraud Working Group will prepare an overview document for use by their members.

TR-45.3, TDMA Subcommittee

TR-45.3 develops TDMA standards. These include IS-54, IS-55, IS-56, IS-7X, and IS-85.

Correspondence

TR-45.3/93.09.13.03 is a letter from P. Bennett (VP, TIA) that outlines TIA’s copyright policy.

TR-45.3/93.09.13.04 includes the following correspondence from P. Nurse (Acting Chair, TR-45.3):

- A letter to D. Rainish (DSP Communications) informing him that his letter requesting clarification of the unwrapped phase specification in IS-55 §6.6.2.9 was referred to TR-45.3.2.
- A letter to A. Angus (Acting Chair, TR-45.0.A) requesting TR-45.0.A’s assistance in developing authentication and privacy specifications for all-digital cellular systems.
- A letter to P. Bennett (VP, TIA) and J. Caile (Chair, Mobile and Personal Communications 800 Section) requesting guidance on what action TR-45.3 should take to assure their standards comply with ANSI C95.1-1992, IEEE Standard with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.
- A letter to P. Bennett and J. Caile requesting guidance on TR-45.3/93.07.27.07 (McCaw). The contribution recommends that TR-45 expand the scope of the Ad Hoc Group on Electromagnetic Compatibility to study the EM immunity of vehicular electronics. It also recommends that TIA contact bodies representing the automobile electronics industry to ensure that their immunity standards prevent undesired interaction with cellular systems.
- A letter to P.J. Louis (Chair, TR-45 NRM) advising him that no official TR-45.3 representative will attend meetings of the TR-45 Network Reference Models Task Group. TR-45.3’s interests will be adequately represented by individual members who attend.
- Letters to J. Marinho (Chair, TR-45) and Tony Akers (Chair, TR-45.1) forwarding information on TR-45.3’s requirements for the FSK control channel.
- A letter to G. Flynn (Chair, TR-45.5) outlining TR-45.3’s disposition of TR-45.5’s comments concerning IS-55-A.
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• A letter to the chairs of TR-45.1, TR-45.2, TR-45.4, TR-45.5, and TR-46.2 advising that TR-45.3 will present an overview of IS-75 call control on September 13, 1993 in Vancouver.

OTHER HIGHLIGHTS

TR-45.3 groups adopted contributions for IS-72, IS-73, and IS-76. TR-45.3 approved TSB-47-A for ballot. After receiving a single nomination, TR-45.3 confirmed P. Nurse (AT&T) as chairperson.

TR-45.3’s development schedule for DCC (Digital Control Channel) standards has slipped at least two months. TR-45.3/93.09.-16.02 is a letter to J. Stupka (Chair, CTIA Technology Committee) from P. Nurse (Chair, TR-45.3) stating this.

TR-45.3 WG2, DUAL-MODE STANDARDS

TR-45.3.2 develops dual-mode cellular standards: IS-54, IS-55, and IS-56. The working group finished TSB-47-A.

TSB-47-A, IS-54-A/B IMPLEMENTATION ISSUES

TR-45.3.2/93.09.13.02 is the final draft of TSB-47-A. It was adopted, as amended, for ballot. TSB-47-A identifies and corrects three problems with IS-54-B that were not corrected by TSB-47:

• Some procedures for activating voice privacy are ambiguous.
• Signaling on the analog voice channel cannot indicate whether a delivered calling party number is network-provided or user-provided.
• The IS-54 method for calculating access-channel boundaries does not match the TIA-553 method.

TR-45.3.2.5, CIRCUIT-MODE DATA SERVICES

TR-45.3.2.5 develops recommendations for circuit-switched data services, with a focus on Async Data Service and Group-3 Fax Service.

TR-45.3.2.5 adopted text for IS-73. See TR-45.3.3.1, below.

RADIO LINK PROTOCOL (RLP)

TR-45.3.2.5/93.08.25.02 (University of Quebec) validates three modes of RLP1: basic, preemptive retransmission, and preemptive transmission with partial feedback. The paper concludes that there are no problems with deadlock or other distressing behavior. It also recommends that to maintain the properties of the basic protocol, RLP1 should only switch from preemptive to basic mode when it has no outstanding retransmissions.

TR-45.3.2.5/93.09.15.02 (NTI) presents a graphical example of RLP1 operation. Based on suggestions from TR-45.3.2.5, J. Michaelides (NTI) will update the example for inclusion in the RLP1 standard.

JOINT MEETING

TR-45.3.2.5 and TR-45.5.1.5 (the CDMA data-services task group) met jointly to review the CDMA stage-1 descriptions for async-data and fax services. TR-45.3.2.5/93.09.14.01 (TR-45.5.1.5) lists 12 discussion items. Highlights of the discussions follow:

• Should the TDMA and CDMA stage-1 services be aligned?
  Possibly, but after TR-45.3.2.5 has done more work on PN-3123, the MT2 asynchronous control standard.
• Should an electrical and mechanical interface be mandated at the Rm interface point?
  TR-30.2 is developing a standard for such an interface. As with all TIA standards, it will be voluntary.
• Should the +++ sequence be used for transition to command mode?
  The +++ sequence is widely used, although it may require licensing. The stage-1 description presents another method of changing to command mode. M. Grobb (Qualcomm) will investigate other methods and advise the groups of his findings.
• Use of multiple active NAMs (Number Assignment Modules) vs. a single NAM and multiple service options.
TR-45.3.2.5 summarized its recommendations on Multiple-NAM operation as contained in Appendix B of the stage-2 description. These recommendations have not been debated by TR-45.3.3. In short, multiple-NAM operation is for further study.

- The service codes and activation codes should be aligned.
  TR-45.1.5 will consider aligning its proposed service codes with the TDMA stage-1 description.

- Several commands in TIA-592 should have optional values mandated.
  All options for the following commands should be mandatory: +FBU, +FCR, +FLI, +FPI, and +FHS. Delete +FTT. Mandate values 0 to 2 for +FMS.

- Can fax servers be used?
  Yes, but TR-45.3.2.5 is not standardizing such a server.

- Does TR-45.3 plan on standardizing transparent data services?
  Yes, but its focus is non-transparent services.

- What plans does TR-45.3 have to forward IS-41 changes for data services?
  TR-45.3 has already identified its IS-41 requirements, and has forwarded to TR-45.2 a stage-3 project plan containing these requirements.

TR-45.3.2.5 members agreed to review the CDMA stage-1 descriptions. Members will pass any comments directly to M. Grobb, the editor of the two documents.

**MT2 DATA CONNECTOR**

TR-45.3.2.5/93.09.13.05 (Chair) comprises mechanical drawings of the MT2 data connector proposed in TR-30.2 (Data Transmission). A draft standard should be ready for review at TR-30.2’s October meeting. A. Sacuta (Chair) encouraged member organizations to review the contribution and provide comments at the next meeting. Members raised the following questions:

- Is the connector cable mountable?
- Has the manufacturer cross licensed the connector, or is the manufacturer willing to cross license the connector?
- Does the connector have an option for a locking retainer?

The task group also agreed that a pin should be assigned for a ring indicator. This will allow terminal equipment to wake up on receipt of an incoming call. A. Sacuta will forward the questions and recommendation to F. Lucas (Chair, TR-30.2).

**OTHER HIGHLIGHTS**

TR-45.3.2.5/93.08.27.01 (Chair) summarizes TR-45.3.2.5’s comments on TR-45.3.3’s baseline text for IS-75, *Um Interface — Call Control*. A. Sacuta will forward the contribution to TR-45.3.3.

TR-45.3.2.5/93.09.13.03 (Chair) comprises a schedule chart and task timeline for circuit-mode data services. The plan shows that lack of progress in developing IS-41 and IS-74 could delay the standards-ready-for-ballot milestone to June, 1994. The contribution recommends that member organizations prepare contributions to TR-45.2 and that TR-45.3.2.5 members volunteer for sections of the RLP1 standard.

TR-45.3.2.5/93.09.13.06 (J. Decuir, Chair, TR-29.2) provides the following liaison from TR-29.2 (Facsimile Digital Interfaces):

- TR-29.2 is adding new options from CCITT T.30 to TIA-592, the Class-2 fax modem standard. This should result in TIA-592-A.
- ITU SG 8 is interested in creating an international standard based on TIA-592. This interest appears to be driven by the need to create useful fax services for GSM.
- Microsoft will continue to support development of cellular data services. This support will appear in several products, including all future major releases of Windows.
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TR-45.3 WG 3, DIGITAL STANDARDS

TR-45.3.3 develops the all-digital cellular standards.

TR-45.3.3 Task Group 1, Matrix

TR-45.3.3.1 compiles and evaluates proposals for the digital control channel (DCC). TR-45.3.3.1, TR-45.3.3.3, and TR-45.3.3.4 met jointly. The following report covers these joint meetings.

IS-72, UM (AIR) INTERFACE — PHYSICAL LAYER, PN-2966

TR-45.3.3.1/93.08.24.07, Proposed LLC sublayer and MAC/Physical layer documents for IS-7x (NovAtel), was adopted as amended. It proposes baseline text for IS-72 and IS-73. IS-72 would specify the physical layer and MAC (Media Access Control) sublayer. IS-73 would specify LLC (Logical Link Control). The contribution is based on IEEE 802, CCITT X.200, the CCITT ISDN standards, and GOSIP (Government Open Systems Interconnection Profile). Consistent with these other standards, the contribution uses service primitives to specify the protocols.

IS-73, UM INTERFACE — LINK LAYER, PN-2967

In addition to TR-45.3.3.1/93.08.24.07, described above, the following contributions were adopted or adopted as amended:

TR-45.3.2.5/93.08.23.05, IS-73 FEC & Interleaving for data services (NTI), proposes RLP1 standards text for FEC (Forward Error Correction) and interleaving. TR-45.3.2.5 adopted the FEC text. Since interleaving resides in the sublayer just below RLP1, J. Michaelides (NTI) will forward the interleaving text to the editor of IS-73.

TR-45.3.2.5/93.08.25.01, SDL for RLP1 (AT&T), proposes SDL (Specification and Description Language) diagrams for the retransmission portions of RLP1 (Radio Link Protocol 1). See also TR-45.3.2.5/93.09.16.01.

TR-45.3.2.5/93.09.13.04, Proposed Text for RLP1 Standard (Chair) is the latest draft of the RLP1 (Radio Link Protocol 1) standard. The text may be incorporated into IS-73, or it may be developed as a stand-alone standard. It comprises 7 sections:
1. Purpose and Scope
2. Overview
3. RLP Structure
4. RLP1 Frames
5. Messages
6. Procedures
7. References

TR-45.3.2.5/93.09.15.01, RLP1 Frame Check Sequence Text (Motorola), proposes IS-73 text that specifies a 16-bit CRC (Cyclic Redundancy Check) code and a 24-bit CRC code. The 16-bit CRC is the standard CCITT code and the 24-bit CRC is the GSM code. The CRC codes will be used to detect errors within RLP1 frames.

TR-45.3.2.5/93.09.16.01, SDL for RLP ARQ Unnumbered Other Procedures (AT&T), presents SDL diagrams for RLP1 setup and negotiation procedures.

TR-45.3.3.1/93.08.24.05, Layer 2 Table of Contents (TDMA Forum), proposes a table of contents for IS-73. TR-45.3.3.1 incorporated portions of the table of contents in the amended version of TR-45.3.3.1/93.08.24.07. See IS-72, above.

TR-45.3.3.1/93.09.13.04, Logical link control procedures for IS-7x (NovAtel), recommends that HDLC (High-Level Data Link Control) be adopted as a framework for the IS-7X link layer. HDLC has been used as a framework for X.25 LAPB, ISDN LAPD, and IEEE 802. TR-45.3.3.1 adopted the contribution, in principle, after NovAtel volunteered to provide more detail on how such a protocol could be implemented.

IS-76, UM INTERFACE — MOBILITY MANAGEMENT, PN-2970

The following contributions were adopted or adopted as amended:

TR-45.3.3.1/93.08.24.03, Base Line Text for Mobility Management (MM) (TDMA Forum), proposes baseline text for IS-76. It includes procedures for power-up registration, geographic registration, periodic registration, forced registration, deregistration, and power-down registration.
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TR-45.3.3.1/93.09.13.03, Comments on Mobility Management Draft Text (Astronet), proposes changes to adopted text for IS-76. It comprises state diagrams, state tables, and 11 recommended changes. Most of the recommended changes stem from difficulties in answering the following question: With which mobility-management entity does the mobile station communicate? For example, while a registration could be assumed to be transacted with the mobile station’s serving system, a deregistration acknowledgment could potentially come from the serving system, a visitor location register, or a remote home location register. Each interpretation has different implications for network traffic, message response time, and transaction reliability. The TDMA Forum, contributors of adopted baseline text, agreed to prepare proposals for how to deal with the contribution’s issues.

OTHER HIGHLIGHTS

TR-45.3.3.1 deferred two contributions from NovAtel. TR-45.3.3.1/93.09.13.05 proposes a project number be assigned for developing a user-network interface document and that the contribution be adopted as baseline text. The contribution is a resubmission of an earlier NovAtel contribution: TR-45.3/92.08.31.03B. TR-45.3.3.1/93.09.13.06 proposes a project number be assigned for developing a channel-structure document and that the contribution be adopted as baseline text. The contribution includes descriptions of mobile bearer channels (Bm) and mobile data channels (Dm). It is a resubmission of an earlier NovAtel contribution (TR-45.3/92.08.31.03D).

TR-45.3.3 TASK GROUP 5, MS/BS REQUIREMENTS

TR-45.3.3.5 is responsible for PN-3185 and PN-3186.

IS-XX, DIGITAL MOBILE-STATION PERFORMANCE, PN-3185
IS-XX, DIGITAL BASE-STATION PERFORMANCE, PN-3186

TR-45.3.3.5 adopted a table of contents for PN-3185, the minimum performance specification for digital mobile stations. TR-45.3.3.5/93.09.14.02 (TDMA Forum) proposes a table of contents for PN-3185. Much of the document is similar in scope to that of earlier performance standards like IS-19 and IS-55. It focuses on physical transmitter and receiver requirements; however, it also includes sections for a subscriber interface, a mobile-station test interface, protocol conformance testing, and options. This last section includes requirements for DTMF and antenna diversity. TR-45.3.3.5 removed the subsection on antenna diversity pending TR-45.3.4’s assessment of capacity enhancements. This decision ensures that premature implementation of any given capacity enhancement does not preclude implementation of a better enhancement.

TR-45.3.3.5/93.09.14.03 (TDMA Forum) discusses the scope of protocol conformance testing. The contribution concludes that it may be more efficient to separate the development of minimum performance specifications and protocol test specifications. The resulting two documents could be combined before final verification and validation.

TR-45.3.3.5/93.09.14.04 shows a proposed task timeline for developing PN-3185 and PN-3186. The schedule shows standards ready for publication by February, 1994. TR-45.3.3.5 deferred the contribution to allow time for review.

TR-45.3 WG 5, SPEECH CODECS

TR-45.3.5 develops standards for speech codecs, including IS–85, IS-78, and IS-79.

OKI has withdrawn from the half-rate codec selection, leaving eight organizations: BNR/NTI, DVSI, HNS, Mitsubishi, Motorola, NEC, PCSI, and Sony. This may increase the amount each organization owes for testing from $15,000 to $18,000. For now, TIA will issue invoices for $15,000 and investigate where it might obtain the additional funds.

The host lab has started data collection. Once it has collected the data, the listening lab will begin listening tests. Listening tests should be complete, and a codec should be selected, by March, 1994. If the funding problem delays contract signing between TIA and the test labs, the current schedule could slip by two months.

Hughes, Motorola, NEC, PCSI, and Sony have responded “yes” to the TIA patent question: Is there anyone present who knows of patents that may be essential to any standard under development at this meeting?

TR-45.3.5/93.09.15.02 (Motorola) describes the half-rate codec submitted by Motorola.

REPORT OF TR-45.2 INTERSYSTEM OPERATIONS SUBCOMMITTEE
SEPTEMBER 20 - 24, 1993, WALNUT CREEK, CA

TR-45.2/93.09.20.01 is the meeting agenda with correspondence attached:

- Letter from AT&T nominating K. Harris as chair of Working Group VI, International Applications.
- Letter from R. Amy, T1S1, concerning the review of Cellular Radio Telecommunications A1-D1 Interface Standard. It shows some suggested modifications to the section 6.2 POI-T5 and POI-S5 (ISUP) Interface Signaling Scenarios.
- Letter from Communications Standards Review introducing E. Baskin, representing ACTION Consulting, to the Subcommittee.
- Cover letter from P. J. Louis for J. Marinho to E. Schimmel recommending PN-3098, Cellular Radio Telecommunications A1-D1 Interfaces Standard, for letter ballot as an Interim Standard.
- Letter from E. Weingart, McCaw Cellular, representing the CTIA TDMA Working Group, to introduce and familiarize TR-45.2 with their mission and the current needs of the Cellular Industry.
- Letter from P. Nurse, Chair of TR-45.3, to all TR-45 chairs regarding call control on the Digital Control Channel.
- Letter from R. Amy, T1S1, concerning clarification of the T1.114-1988 aspects that TR-45.2 raised in their liaison letter. The following four items are clarified:
  1) Zero Length Invoke ID.
  2) Unsolicited Return Result.
  3) Changing Nature of transaction
  4) Return Error in Response to a Return Result.

TR-45.2/93.09.20.07 (Cellular Networking Perspectives) lists TR-45.2 project statuses, showing the project numbers, titles, assigned editor, and assigned working group. It also lists the detailed status of IS-41 Rev B.

TR-45.2/93.09.24.01 is a press release from CTIA concerning CTIA Issues Request For Information (RFI) for Intelligent Network Input on September 24, 1993.

TR-45.2/93.09.24.02 is a letter from Northern Telecom nominating A. Calis for the position of Chair of TR-45.2 Working Group VI, International Applications. Additional nominations were requested by the Chairman for the next meeting of TR-45.2.

TR-45.2/93.09.24.05 is Working Group VII’s report to the closing TR-45.2 plenary. The Working Group established an editorial task group to incorporate changes to the revision of IS-52. IS-52 Rev. A is attached,
COMMUNICATIONS STANDARDS REVIEW

showing a freeze on baseline text in December, 1993. The Working Group has been assigned PN-3098 for Cellular Radio Telecommunications A-D Interface standard (to become IS-93). The Working Group recommended that TR-45.2 draft letters to Associated Public Safety Communications Officers (APCO), National Emergency Number Association (NENA), and the Network Operations Forum (NOF) soliciting comments on PN-3098’s appendix on Emergency Services.

TR-45.2/93.09.24.07 is a letter to S. Jones, Chair, TR-45.4, regarding TR-45.2’s review of PN-3142.

TR-45.2/93.09.24.10 is a draft letter from TR-45.2 to TR-45.1, TR-45.3, TR-45.4, and TR-45.5, concerning extended MINs outside the North American Numbering Plan area. The items 1, 2, 4 and 5 are to be the same as TR-45.2.6/93.09.23.04 of Working Group VI.

A series of papers (FCC News, et al) were distributed for information only, no number was assigned. They concern the FCC allocation of spread spectrum (CSR 45.2/93.09.xx).

IS-41 REV C WORK (CELLULAR RADIO TELECOMMUNICATIONS INTERSYSTEM OPERATIONS)

TR-45.2/93.09.20.05 (T. Ginter, Ericsson) gives an estimate of committee time to complete IS-41 Revision C. It showed a change of delivery time of IS-41-C from completion in December, 1993, to June, 1994. J. Marinho (chair) will ask TIA if a time extension is possible, since the five year time clock on IS-41-B will expire in December.

TR-45.2/93.09.20.07 (D. Crowe, Cellular Network Perspectives) lists the current status of TR-45.2 projects, and IS-41 Rev A and B implementations.

TR-45.2/93.09.20.08 (T. Jacobson, AT&T Bell Labs) discusses TR-45.3 Digital Control Channel’s impact on IS-41-C. This was sent to P. Nurse (Chair TR-45.3) and E. F. Weingart (Chair CTIA TDMA WG) as an initial evaluation of the TDMA DCC impact on IS-41-C.

TR-45.2 WG I, MESSAGE ENCODING AND PROTOCOL SELECTION

TR-45.2.1 formed TG 2, with T. Jacobson (AT&T Bell Labs) as chair. TG 2 will integrate the Authentication TSB into IS-41.

PN-2985, IS-41-B

TR-45.2.1/93.09.22.03 is PN-2985, IS-41-B Technical Notes TSB, Draft 4, proposed baseline text, dated September 22, 1993.

TR-45.2.1/93.09.22.04 (ISOTEL Research, Ltd. representing ALCATEL) addresses IS-41 forward and backward compatibility. IS-41 Revision B forward and backward compatibility guidelines and the IS-41 Revision A forward compatibility guidelines under development are unclear about the action to be taken on receipt of a recognized parameter with an unacceptable value. TR-45.2.1/93.09.22.04 lists reasons why certain parameters should be ignored to ensure backward and forward compatibility, and why such parameters should not cause the rejection of the entire message. Proposed text changes for IS-41 are included.

TR-45.2.1/93.09.22.05, Use of Return Error versus REJECT in IS-41 (ISOTEL Research, Ltd. representing ALCATEL), defines the circumstances under which Return Error should be used in IS-41, and when a TCAP REJECT should be used instead.

TR-45.2.1/93.09.22.06 (D. Crowe, ALCATEL) defines the term SWID, used in IS-41 and other TIA standards, to be the same as MSCID. Having two terms meaning the same thing, but defined in different ways, is confusing. IS-41 stage III text shows the impact of replacing the term SWID in IS-41 either by MSCID or SID and SWNO, depending on the context.

TR-45.2.1/93.09.22.07 (D. Crowe, ALCATEL) provides stage 3 descriptions for problems in IS-41 that were identified in the June and July, 1993 TR-45.2 meetings. The problem resolutions that were accepted were:

a. Resolution of problems with the BillingID parameter.
b. Several circuit state handling problems.
c. Handling of FaultyParameter information element.
d. Handling of Missing Mandatory Parameters.

TR-45.2.1/93.09.22.08 (T. Jacobson, AT&T Bell Labs) provides reasons for using two distinct messages for CSSDeregistration and DeregistrationNotification Message.
COMMUNICATIONS STANDARD REVIEW

TR-45.2.1/93.09.22.09, IS-41-C Authentication and Privacy (T. Jacobson, AT&T Bell Labs), suggests modifications and additions to TSB-51 (Authentication, Signaling Message Encryption, and Voice Privacy) which are needed to incorporate Authentication and Privacy into IS-41-C. These modifications and additions include:

- Corrections and clarifications.
- Addressing the TSB-51 deferred items.
- Robust defense against attacks by analog clones using the MIN/ESN of authentication capable mobiles.
- Support of new types of mobiles (e.g., IS-95).
- Other modifications based on industry review of TSB-51.

TR-45.2.1/93.09.22.10, IS-41 Protocol Extensions (T. Jacobson, AT&T Bell Labs), identifies blocks of IS-41 Message Identifiers, Parameter Identifiers, Return Error Identifiers, and Parameter Values that should be reserved for extending the IS-41 Intersystem Operation. The reserved blocks can be used by services providers, network providers, and manufacturers to implement features and functions that are not currently defined in IS-41. The reserved blocks are identical to those recommended by Ericsson and AT&T in contributions submitted to TR-45.2.1 in March and May, 1993. Additionally, TCAP Private parameters could be used to extend IS-41 protocols.

TR-45.2.1/93.09.22.13 (Motorola) contains editorial comments on PN-2985, draft 3.

TR-45.2.1/93.09.23.01, Terminal Information from IS-54-B Mobile Stations, and TR-45.2.1/93.09.23.02, Terminal Information from IS-95 Mobile Stations (both from A. Holcman, Qualcomm), were submitted for information only.

TR-45.2.1/93.09.23.03 (T. Jacobson, AT&T Bell Labs) recommends editorial changes to PN-2985, Draft 2 of the IS-41-B Technical Notes TSB. These changes will correct typographical errors, enhance readability and correct minor technical errors. A major technical change to Appendix A, Digits Parameter Clarification, is also recommended. This appendix introduces the concept of an Extended Routing Number that would use both Digits (routiing) and Digits (destination) to define routing of a call. The appendix also modifies the use of the “Telephony Number Plan” field in the Digits parameter and recommends use of the “Nature of Number” field. These concepts are outside the scope of clarifications needed for inter-operability and should not be included in the TSB. The recommended changes were accepted by the committee.

PN-3063, FORWARD COMPATIBILITY RULES

TR-45.2/93.09.20.02 is comprised of ballot responses to PN-3063, IS-41 Revision A Forward Compatibility Rules (for publication as TSB-55). There were 26 ballots: 17 Yes, 5 Yes with comment, 0 No, and 4 No Comments.

TR-45.2/93.09.20.09 (T. Jacobson, AT&T Bell Labs) is editorial comments on the PN-3063 ballot.

TR-45.2/93.09.24.08 is the ballot version of PN-3063, IS-41 Rev. A, TSB-55, Forward Compatibility Rules. After the revision marks are removed, it will be forwarded to the TIA for re-balloting of page 4 lines 32-37 concerning IS-41-A network nodes. It will then be ready to be published.

PN-3199, IS-41-B SUPPORT FOR DUAL-MODE WIDEBAND SPREAD SPECTRUM MOBILE STATIONS

TR-45.2/93.09.24.09 is baseline text revision 5 for PN-3199. It was approved to be sent to TIA for a 30 day ballot.

TR-45.2.1/93.09.22.12 are Validation and Verification comments on PN-3199 containing editorial changes only.

TR-45.2.1 TASK GROUP 1

Four documents were submitted. All were deferred to the next meeting, pending review:

TR-45.2.1.1/93-09-24-01 (Motorola), Decision Points 9-21, 26, 27, 46 & 49 Stage-3.

TR-45.2.1.1/93-09-24-02 (Motorola), Decision Points 9-20, 26, 46 & 49 Impacts on Handoff.

TR-45.2.1.1/93.09.24.03 (D. Crowe, Alcatel), Stage III Description for Decision Point #42: Flash Request Response.

TR-45.2.1.1/93.09.22.04, (A. Calis, Northern Telecom), Stage-3 for Decision Point 47.
TR-45.2.2 is working on defining Stage 2 descriptions of features in IS-53-A (PN-2977). These Stage 2 feature
descriptions will be included within PN-2991, IS-41-C.

**TR-45.2.2/93.09.20.01** is the meeting agenda showing the proposed work plan for Stage 2 and Stage 3
specifications for IS-53 Rev. A Features and Data Services.

**TR-45.2.2/93.09.20.03** (T. Verdonk, BC Tel Mobility Cellular) concerns Voice Mail Redirection from a non-
home originating MSC (stage 2 description). It contains a stage 2 proposal which will modify call forwarding
procedures to allow for call redirection to non-PSTN translatable numbers (including voice mailbox numbers) from a
MSC which is not the called mobile’s home MSC. The concept of a “TAG” parameter was agreed upon; the group
wanted more study done for presentation at the next meeting.

**TR-45.2.2/93.09.20.04** (T. Verdonk, BC Tel Mobility Cellular) contains a stage 2 proposal which will allow
feature code retrieval of voice mail via Reach-Back Routing. Reach-Back Routing can be used to access any off-
network service supported by the roamer’s home service provider. The “TAG” parameter discussed in **TR-
45.2.2/93.09.20.03** would also be used in this feature. A Temporary Local Directory Number (TLDN) is
requested from the home MSC to handle voice mail.

TR-45.2.2/93.09.20.05 (M. Houde, Ericsson) proposes a stage 2 description for the Mobile Access Hunting feature.

TR-45.2.2/93.09.21.06 (T. Hart and C. Ishman, Motorola) contains a stage 2 description of the proposed Do Not
Disturb feature. After some proposed changes by the group, Motorola was requested to make modifications and
present this feature at the next meeting.

TR-45.2.2/93.09.20.07 (T. Hart and C. Ishman, Motorola) contains a stage 2 description of the proposed Calling
Number Identification Presentation (CNIP) feature. The contribution notes the use of sub-addressing fields as for
further study.

TR-45.2.2/93.09.20.08 (T. Hart and C. Ishman, Motorola) contains a stage 2 description of the proposed Calling
Number Identification Restriction (CNIR) feature. **TR-45.2.2/93.09.20.16** (K. Carlson and M. Gallagher, Synacom
Technology) also contains a stage 2 description of the proposed Calling Number Identification Restriction (CNIR)
feature.

TR-45.2.2/93.09.20.09 (T. Hart and C. Ishman, Motorola) contains a stage 2 description of the proposed Selective
Call Acceptance (SCA) feature.

TR-45.2.2/93.09.20.10 (T. Hart and C. Ishman, Motorola) contains a stage 2 description of the proposed Message
Waiting Notification (MWN) feature. **TR-45.2.2/93.09.22.04** (A. Calis, Northern Telecom) includes
recommendations for stage 2 and 3 service descriptions of Message Waiting Notification.

TR-45.2.2/93.09.20.11 (K. Carlson and M. Gallagher, Synacom Technology) contains a stage 2 description of the
proposed Message Waiting Notification (MWN) feature.

TR-45.2.2/93.09.20.12 (K. Carlson and M. Gallagher, Synacom Technology) contains a stage 2 description of the
proposed Remote Feature Control feature.

TR-45.2.2/93.09.20.13 (K. Carlson and M. Gallagher, Synacom Technology) contains a stage 2 description of the
proposed Preferred Language feature.

TR-45.2.2/93.09.20.14, Feature Routing Control (K. Carlson, Synacom Technology), proposes an Intelligent
Network like approach for reporting of routing problems associated with a call and a subscriber’s features. The
general approach is to use common trigger points and allow the handling of the call features to be an HLR decision.
This is to ensure uniform and seamless treatment for features on all manufacturer’s switching equipment.

TR-45.2.2/93.09.20.15 (K. Carlson and M. Gallagher, Synacom Technology) contains a stage 2 description of the
proposed Priority Access and Channel Assignment (PACA) feature.

TR-45.2.2/93.09.20.17 (K. Carlson, Synacom Technology) analyzes the effect of near and far end generation of call
progress tones on Flexible Alerting. Because multiple legs can be extended from the Originating MSC, supplying
call progress tone information to the originator can be misleading.
COMMUNICATIONS STANDARD REVIEW

TR-45.2.2/93.09.20.18 (K. Carlson, Synacom Technology) analyzes the pros and cons of having the HLR digit translation of feature code strings. It suggests letting the HLR translate the feature codes to provide local service provider with local vertical service codes.

**TR-45.2.2/93.09.20.19** (C. Blum, AT&T) provides a stage 2 service description for Call Waiting. IS-53 Rev. A enhances Call Waiting to provide the ability to cancel call waiting on a per call basis:
- For the next call
- For a call in progress
- During call setup

**TR-45.2.2/93.09.20.20** (C. Blum, AT&T) suggests stage 2 service descriptions for Call Forwarding (CFNA, CFB, CFU, and CFD).

**TR-45.2.2/93.09.20.21** (C. Blum, AT&T) discusses the formatting of the Calling Party Number parameter within IS-41 messages.

**TR-45.2.2/93.09.20.22** (T. Jacobson, AT&T Bell Labs) describes the addition of serving MSCID parameter to RegistrationNotification INVOKE (and related messages).

TR-45.2.2/93.09.20.23 (K. Carlson, Synacom Technology) provides clarification of the usage of MSCID for IS-41 Revision B.

TR-45.2.2/93.09.20.24 (K. Carlson, Synacom Technology) proposes an ActionCode parameter to control telephony signaling for providing call progress tones, announcements, routing control, and digit collection.

TR-45.2.2/93.09.20.25 (K. Carlson, Synacom Technology) reviews IS-53 alerting sequences and Q.1281 alerting codes and describes some options for the encoding of parameters for announcements and tones.

**TR-45.2.2/93.09.22.01** (D. Crowe, Alcatel) reflects the current edited version 1.3 of PN-2910, IS-41 Revision B, Mobile Border System Problems.


**TR-45.2.2/93.09.22.03** (D. Crowe, Alcatel) provides border cell TSB page replacements (changed based on AT&T comments) of 9, 10, 26, 27, and 28.

**TR-45.2.2.1/93.09.20.01** (A. Calis, Northern Telecom) provides a test case for feature use following handoff on CFU, 3WC, and Call Waiting. These test cases are proposed for the TSB for Cellular Application Level Testing.

**TR-45.2.2.1/93.09.20.02** (J. Rhodes, McCaw and D. Crowe, Alcatel) provides test cases for Call Forwarding/Handoff interaction.

**TR-45.2.3 Chair T. Ginter (Ericsson) set work assignments for IS-41-C, Handoff.**

TR-45.2.3/93.09.21.03 (T. Saboorian and A. Calis, Northern Telecom) recommends intersystem requirements to support Circuit-Mode Data Services. It suggests that TR-45.2 begin its work by specifying the requirements for Basic Call Delivery.

**TR-45.2 WG III, ENHANCED HAN DOFF REQUIREMENTS**

**TR-45.2 WG IV, MESSAGE ACCOUNTING**

**PN-2754, CELLULAR RADIO TELECOMMUNICATIONS INTERSYSTEM NON-SIGNALING DATA COMMUNICATIONS**

TR-45.2.4 addressed ballot responses to PN-2754. All objections were addressed; all changes were deemed editorial in nature. WG IV will forward PN-2754 to TIA for publication. The IS number will be assigned prior to publication.

**TR-45.2.2/93.09.20.03** is comprised of ballot responses to PN-2754. There were a total of 24 ballots: 12 Yes, 7 Yes with comment, 2 No with comment, and 3 No Comments.

TR-45.2/93.09.20.04 are ballot comments from K. Carlson, Synacom Technology.
COMMUNICATIONS STANDARDS REVIEW

TR-45.2/93.09.20.06, ballot comments from Rogers Cantel, recommended that the following Call Detail Generation Scenarios should be included in PN-2754 as Appendix I:

- Completed Delivered Call Forwarding - Busy
- Abandoned Delivered Call Forwarding - Busy
- Call delivery with Completed Three Way Call
- Roam Port Access Call Completed Delivered
- Roam Port Access Call Completed Delivered Call Forwarding - Busy
- Roam Port Access Call Completed Delivered Call Forwarding - No Answer
- Roam Port Access Call Completed Delivered Call Forwarding - Unconditional

Additional parameters recommended are: CallingCategory, CallingIndicator, CalledIndicator, RoamPortIndicator, and ReleaseIndicator.

TR-45.2.4/93.09.23.03 is a committee letter ballot for PN-2754 from Qualcomm (Yes with comments).

TR-45.2/93.09.24.06 (Computer Generation Inc., US West New Vector, NTI, and GTE) is an informative appendix (Appendix I) to PN-2754, Data Message Handler (DMH). The appendix provides an alternate approach using CCITT Recommendation X.400. After much discussion and a roll call vote, Appendix I (TR-45.2/93.09.24.06) was included in PN-2754. It was not considered a substantive change to PN-2754.

TR-45.2 WG V, Exceptional Transactions and Administrations Support

TR-45.2.5/93.09.20.03 (A. Calis, Northern Telecom) contains editorial and technical comments on PN-2977 (IS-53-A).

TR-45.2.5/93.09.20.04 (J. Willse, CIBERNET and G. Pellegrino, Bell Atlantic Mobile) points out what CIBERNET and Bell Atlantic Mobile perceive as a better method to provide Selective Call Acceptance (SCA) in PN-2977 (IS-53-A). The description of the service provides for a list of “approved telephone numbers” which can complete calls to the mobile set. CIBERNET and Bell Atlantic Mobile propose the additional use of a “Code Number” which the mobile customer would pass to those parties from whom the mobile customer would like to receive calls. The proposed method would allow the “approved party” to call from any phone.

TR-45.2 WG VI, Int’L Applications of EIA/TIA 553 Related Standards

TR-45.2.6/93.09.23.03 (K. Harris, Working Group VI Chair) provides information relative to the working group. The contribution contains TR-45.2.6/93.05.04.06 (International Subscriber Identification, K. Carlson, Synacom) and TR-45.2.6/93.05.04.09 (Liaison Report of the Ad Hoc International Coming Committee, S. Jones, NEC).

TR-45.2.6/93.09.23.04 (A. Angus, NovAtel) is the formal report of the Ad Hoc on International Roaming. The appendix was considered separate because it was viewed as an individual company opinion.

TR-45.2.6/93.09.23.05 is PN-3173, International Implementation of Cellular Radiotelephone Systems Compliant with ANSI/EIA/TIA-553, proposed TSB-29 Revision B, dated June 8, 1993. ITU-T E.212 is used as a framework to accommodate mobile identifications numbers (MINs) and tables of pre-assigned system identifications numbers (SIDs) are also provided. Appendix 1 identifies known conflicts.

TR-45.2 WG VII, PSTN/ISDN Interfaces

TR-45.2.7/93.09.21.04 is a letter from J. Bissonnette to P. J. Louis dated September 9, 1993 which gives an overview and key contacts of organizations working on E911 issues.

PN-3098 (A1 - D1 Interfaces Standard [PSTN/MSC]) is currently out for letter ballot. WG VII received comments from T1S1 on PN-3098; the working group will write back explaining what was accepted and what wasn’t.

PN-3166, Dialing Plan and Call Processing Treatment for Use in the Cellular Radio Telecommunications Services

TR-45.2.7/93.09.21.05 is a draft work plan for update of IS-52 (PN-3166), which will be ready for publication in February, 1994. It was accepted. IS-52 Revision A will be allowed to be published prior to IS-53 Revision A.
**COMMUNICATIONS STANDARD REVIEW**

**TR-45.2.7/93.09.21.06** (R. Snyder, Synacom Technology) proposes modifications to the defined user dialing sequences in PN-3166 to provide consistency between IS-52 and the signaling interface sequences for the $A_i$ and $D_i$ interfaces as specified in PN-3098.

**TR-45.2.7/93.09.21.07** (R. Snyder, Synacom Technology) specifies decision points for items requiring clarification and consistency for the PN-3166 baseline text. Also included is a proposal for performing the required edits on PN-3166.

**TR-45.2.7/93.09.21.08** (S. Jones, NEC) is the current version of PN-3166 baseline text, dated September 21, 1993.

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**ROSTER OF TR-45.2, SEPTEMBER 20 - 24, 1993, WALNUT CREEK, CA**

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<td>John Marinho, AT&amp;T</td>
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The next issue of Communications Standards Review (Vol. 4 #10) is scheduled for December, 1993.
Since a quorum was not present (16 members needed, 14 members present), the plenary was adjourned, with no business transacted. J. Marinho, TR-45 chair noted that this was the second consecutive plenary without a quorum (see the TR-45.3 report, p. 4 of this issue), and indicated that he would set the date of the next TR-45 plenary to encourage attendance.

A number of documents were made available to attendees (and will be resubmitted to the next TR-45 plenary). Those of particular interest include:

- **TR-45/93.08.24.08**, Message Type Assignments for the Extended Protocol Facility of ANSI/EIA/TIA-553 and EIA/TIA IS-54 (P. Nurse, TSB 39 editor), brought forward from the August 24 meeting (see page 4, this issue).

- **TR-45/93.08.24.03**, Short Message Service (T. Watts, Southwestern Bell Technology Resources), brought forward from the August 24 meeting (see page 4, this issue). This requests development of a service for the delivery of short numeric and alpha-numeric text messages with user selective predefined acknowledgments from the mobile user to the sender.

- Committee correspondence from P. Nurse (TR-45.3 chair), in response to TR-45’s request for identification of those essential elements of signaling over the FSK control channels. Attached to the cover letter are:
  - A list of the enhancements which have been incorporated into the signaling over the FSK control channels by IS-54
  - A brief description of the future control channel requirements of the FAX/Data service

- A copy of the draft version of the analog base station performance specification from Dual Mode Wideband Spread Spectrum Digital Cellular (IS-95), from TR-45.5. This specification was adapted from PN-2930, Recommended Standard for 800 MHz Digital Network (to be published as IS-56-A), dated June 11, 199. The new project is PN-3120 (Recommended Minimum Performance Standards for Base Stations Supporting Dual-Mode Wideband Spread Spectrum Cellular Mobile Stations).

- A list of draft ETSI standards available from TIA for comment which are in the public comment phase.

_Elaine Baskin, CSR_

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**TR-45 Plenary Roster, September 24, 1993, Walnut Creek, CA**

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<tr>
<td>John Marinho</td>
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<td>ACTION Consulting</td>
<td>Elaine Baskin</td>
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<td>Alcatel</td>
<td>John A. Marinho</td>
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TR-45.4 Working Group II was reassigned with a mandate to initially establish requirements for the “A” interface between the MSC and the BS as defined by the TR-45 network reference model. The subcommittee felt that after the requirements are complete, the Working Group could start on the A interface standardization.

TR-45.4/93.09.27.03, correspondence from W. Zan of CANTEL, proposes delay of work on the A-interface standard until the receipt of the “Cellular Network Open Architecture (CNOA)” User Requirement Specification. The letter was received as information for consideration.

TR-45.4/93.09.27.04 (Telocator) covers Flexible Alerting (FA) which causes a pilot directory number to branch the call into several legs to alert several telephones simultaneously. TR-45.4/93.09.27.04 identifies normal procedures with successful outcome and unsuccessful outcome on authorization, registration, activation, invocation and the reverse thereof, and identifies interactions with personal communications services. The contribution was remanded to Working Group I for discussions.

TR-45.4/93.09.27.05 (Telocator) covers the supplementary service of Automatic Recall which allows a calling PCS subscriber, encountering a busy, to be notified when the busy called party becomes not busy, and to have the service provider re-initiate the call to the specified called party if the calling PCS subscriber desires. Normal procedures with successful outcome and unsuccessful outcome are identified as well as interactions with other personal communications service. The contribution was remanded to Working Group I for discussions.

TR-45.4/93.09.27.06 is a news release from the FCC for the new personal communications services established (GEN. Docket 90-314) dated September 23, 1993. The Commission has authorized new personal communications services (PCS) in the 2 GHz emerging technologies bands. This was submitted for information only.

TR-45.4/93.09.27.07 (H. Halliburton, PacTel Corp.) discusses the reasons and recommendations for TR-45.4 to start work on the A-interface standardization process. PacTel recommends that the Chair of TR-45.4:

• Appoint a convener to establish a new working group within TR-45.4 for standardization of the A-interface.
• Establish an ad hoc working group (which will report to the new working group convener/chairman) to start work on the stage 1 requirements document for the new A-interface standard.

TR-45.4/93.09.27.07 recommends that all three stages be done in the new working group.

TR-45.4/93.09.27.08 (M. Burke and K. Skurnak, Motorola) requests TR-45.4 to initiate the development of a standard interface between the Mobile Switching Center (MSC) and the Base Station (BS), corresponding to the TR-45 Network Reference Model “Reference Point A” by starting work on the Stage 1 requirements.

TR-45.4/93.09.27.09 (M. Burke, J. Csapo, and C. Ishman, Motorola) requests support of “A+ Interface Standardization.” This was a contribution submitted to TR-45.2 on July 12, 1993 requesting the initiation of the process. TR-45.4/93.09.27.09 contains historical documents for the past discussions of the interface standardization. Also attached is an “A+ Interface” overview presentation which provides insights into an MSC to BS interface standard recommendation.

TR-45.4/93.10.01.01 (P.J. Louis, Bellcore) is Working Group I’s report. They are still awaiting TR-45’s recommendation concerning PN-3034 (Service Descriptions); they issued a call for contributions against PN-3141 (Definitions & Acronyms).

TR-45.4/93.10.01.02 (P. J. Louis, Bellcore) is the report of the first meeting of Working Group II, the new working group for the establishment of stage 1 requirements and standardization for the “A-interface.” The group approved a scope and charter and established the name as “A-Interface” working group. Election of the permanent chair will be held at the December meeting.

TR-45.4/93.10.01.03 is Working Group III’s report.

TR-45.4/93.10.01.05, organizational chart of TR-45.4 as of this meeting, shows three working groups:

• WG-I PCS Services
• WG-II A-Interface Standards
• WG-III Microcell/Microsystems

TR-45.4/93.10.01.06 (J. Crollick, GTE TSI) is a contact list of the active participants of TR-45.4.

TR-45.4/93.10.01.07 (M. Burke, Motorola) proposes a work plan for the development of the A-interface standard.
COMMUNICATIONS STANDARDS REVIEW

**Working Group I, PCS Services**

TR-45.4.1/93.09.27.02 (S. Jones, NEC) is the current revision of PN-3141, “Personal Communications Service Definitions and Acronyms for Public 800 MHz”, Baseline Text.

TR-45.4.1/93.09.27.03 (S. Jones, NEC) is the current revision of PN-3034, “Personal Communications Service Descriptions for Public 800 MHz (PCSD).”

**Working Group II, A-Interface**

TR-45.4.2/93.09.27.02 is the initial proposed scope and charter of WG II.

TR-45.4.2/93.09.27.03 (H. Halliburton, PacTel Corp.) also recommends a scope and charter for the working group.

TR-45.4/93.10.01.09 is the approved scope and charter of Working Group II. It will be presented to TR-45.4 at the November meeting for approval.

**Working Group III, Microcell/Microsystems Standards**

TR-45.4.3/93.09.30.01 is the meeting summary for the Joint Ad Hoc on 800 MHz PCS Air Interface, September 28-30, 1993.

TR-45.4.3/93.09.30.02 (S. Jones, NEC) is proposed draft revision 0.1 of PN-3142, “Cellular Microcell/Microsystems Requirements Document (CMMRD).” It reflects the edited changes from the week’s deliberation. The changes are from a draft letter from TR-45.2’s review. TR-45.2 will make additional recommendations in the future. Attached to TR-45.4.3/93.09.30.02 is the draft letter and the original CMMRD.

**Ad Hoc 800 MHz PC SAir Interface**

TR-45.4.3.AHPAI/93.09.28.05 (B. Litzinger, Editor, Southwestern Bell Tech. Resources) is the current revision of PN-3165, “Mobile Station-Land Station Compatibility Specification for Analog Cellular Auxiliary Personal Communications Service”, baseline text dated August 18, 1993.

TR-45.4.3.AHPAI/93.09.28.04 (J. Avery, MCC/Panasonic) proposes changes to PN-3165, related to Order and Order Qualification codes.

TR-45.4.3.AHPAI/93.09.28.06 (K. Carroll and E. Çubukçu, NYNEX) comments on PN-3165. PN-3165 should support a variety of air interfaces (e.g., CDMA, TDMA, and NAMPS). The microsystem should have the capability to notify the cellular system and exchange messages with it through IS-41 network so that it could coordinate and take the necessary actions in the event that a mobile unit leaves or enters the microsystem service area.
COMMUNICATIONS STANDARD REVIEW

**TR-45.4 MEETING ROSTER, SEPTEMBER 27 - OCTOBER 1, 1993, TAMPA, FLORIDA**

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<td>P. J. Louis, Bellcore</td>
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<td>U. S. Dept. of Defense</td>
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<td>U. S. West</td>
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ICFA BFT SPECIAL INTEREST GROUP

J. Rafferty (Human Communications) hosted an informal meeting of a new ICFA interest group on BFT. The focus of this group’s work will be the promotion of BFT. A group of about 25 people attended the BFT special interest group. Fisk Communications, Thought Communications and a few other vendors have BFT implementations but they are not compatible due to incompatible file types. Fisk noted that one desirable feature of BFT is the ability to transfer machine readable files that are much smaller than the equivalent T.4 graphic representations. This can offer users significant transmission cost savings. The BFT special interest group wants to find a solution to compatibility problems, possibly via interoperability testing, and to promote BFT as a standard means of file transmission.

LIAISON REPORTS

V.fast/V.id
G. Griffith (Rockwell) reported on the work on V.fast/V.id (now termed V.34 and V.8) in TR-30.1 and SG 14. He noted that the technical work on V.fast is expected to be completed by the end of the year.

G3 & G4 Color
H. Silbiger (AT&T) reported on the Joint meeting of SG 8/Q3 G4 color and ISO/IEC JTC 1 SC18 WG 3 in September, 1993, which added attributes for color to T.417 (Raster Graphics Content Architecture). TR-29/93-10-88 is an overview of the proposed changes. With these changes, T.417 will support both JBIG (T.82) and JPEG (T.81). H. Silbiger expects that approval will take at least through 1995 for G3 & G4 color.

TR-29/93-10-81 is a copy of a liaison from ISO/IEC JTC1-SC29 WG10 to SG 8 Q4. This was passed to TR-29 by the X3L3 JPEG ad hoc. This liaison supports downloadable Huffman tables, by noting the difficulty of defining a default Huffman table that performs well (less than 5% impact) when compressing a wide range of images. This supports the direction of the TR-29 ad hoc color fax committee.

H. Silbiger reported on the AIIM C13-7 meeting in Washington DC. Based on industry requests, they are working to extend the MS-53 image file to handle more than one page and to improve file identification. TR-29/93-10-87, Proposed draft Recommendation T.imagefile, is the contribution that AIIM is bringing forward to SG 8. It addresses one bit per picture element, bi-level imagery that is either compressed or not compressed and is based on ODA Raster Document Application Profile. It does not include multipage support or document management attributes.

T.611 AD HOC (FAX PCI)

H.S. Magnuski (Gammalink) reported on the work in the T.611 ad hoc. He expressed his appreciation to R. Goldstein (France Télécom) and M. Frey (DBT, Germany) for coming to assist in this work. K. Krechmer (ACTION Consulting) distributed the minutes of the T.611 ad hoc (TR-29/93-10-112) and the proposed U.S. delayed contribution "Proposed Modifications to T.611" (TR-29/93-10-113). This contribution is a result of the T.611 ad hoc efforts and proposes changes to T.611 to better support large/high volume fax server application. TR-29 unanimously supported sending this contribution to U.S. SG D for approval as a delayed contribution to ITU-TS SG 8.

CALL SELECTION

E. Baskin (Communications Standards Review) presented TR-29/93-10-93 for information. It notes the harmonized requirements that have been developed for auto dialing support in the U.S. and Canada. It also provides the proposed wording from the Consumer Protection Act.

FAX ROUTING AD HOC REPORT

TR-29/93-10-101 is a review of open issues and proposed structure of a draft facsimile routing proposal from J. Rafferty, the editor. His ad hoc committee has agreed to a position (TR-29/93-10-108) in support of the Japanese proposal (TR-29/93-10-103) which implements the Space character as a fill character and allows the use of the “#” and “*” in the PWD/SEP/SUB fields. TR-29/93-10-108 was not supported as a U.S. contribution as there is no need to make a contribution to simply agree with a proposal. The ad hoc report, TR-29/93-10-107,
notes the use of the # sign as a delimiter and the * as reserved for user applications and the need to define a means to encode multiple fax “extensions.”

**TR-29/93-10-104** (D. Duehren, Brooktrow) suggests not using IA5 as a character set because of difficulties with different language representations. It also notes that aliases can be utilized which are translated locally into numeric representation.

**TR-29/93-10-105**, Basic SUB Information Field Format (D. Duehren, Brooktrow), suggests putting in extension (single or multiple) in the T.30 SUB field by utilizing the # sign as a delimiter.

**TR-29/93-10-106**, Ideas for Enhanced SUB Field Use and Format (D. Duehren, Brooktrow), suggests using the * for enhanced applications and also suggests utilizing such characters as ? for wild card, + to indicate a phone number and / for indirect reference.

V. Cancio (Xerox) presented **TR-29/93-10-100**, a proposal to extend the SUB field and introduce a pause character (undefined). The committee did not support this as a U.S. contribution.

H. Silbiger moved that the U.S. should support the Japanese proposal with the addition of support for a longer SUB field (length to be determined). This was supported unanimously.

**HIGH PERFORMANCE FACSIMILE**

G. Griffith (Rockwell) presented **TR-29/93-10-109**, Startup Timing for V.fast Facsimile. This preview paper takes the existing V.8 (V.id) work and proposes an implementation for future G3 facsimile. It shows a 5.5 second total start-up sequence using a 200 msec off-hook/billing delay. It also includes the capability to allow the network DCME to intervene in the option selection process. The V.21 sequences have been defined to preclude HDLC flags. The paper proposes a 600 bit/s data rate (based on work already proposed in TR-30.1 ad hoc) for negotiation. There is interest in TR-29 in having a higher data rate.

**TR-29/93-10-95**, Draft Recommendation V.id, was presented for information. This work is still changing; G. Griffith described areas in which the Rapporteur is in the process of modifying.

**COLOR FAX**

**TR-29/93-10-84R1** (D. Lee, HP) reports on the U.S. work to provide an alternative to the current proposal from Japan (SG 8 D-389, April, 1992) for color fax as an extension to G4. **TR-29/93-10-84R1** includes a proposed delayed contribution to SG 8 that adds an additional octet (bits 69 through 75) to the T.30 DIS/DTC and DCS frames. Quantizing tables of no more than 4 x 64 octets are used. The proposal also requires ECM. The proposed new octet supports:

- JPEG compression on/off
- Grey scale or full color
- Downloading or default Huffman table
- 8 bits/pel/component or 12 bits/pel/component
- 4:1:1 subsampling ratio or no subsampling ratio (1:1:1)
- Use D50 standard illuminant or use custom illuminant
- Default gamut range or custom gamut range

The Huffman tables (max 1K octets) are always sent. This allows the data stream to be sent to any receiver. However, the bit assigning the Huffman table allows the receiver to utilize its default tables. This approach allows the receiver a choice but not the transmitter. The committee was concerned about how a computer fax machine would recode the transmitted stream. H. Silbiger suggested that a contribution is needed to describe this issue but should not delay the papers which are the first contributions on G3 color fax.

**TR-29/93-10-85R1** is the companion contribution from A. Mutz (Eastman Kodak). It includes a proposed delayed contribution to SG 8 to add an Annex I to T.4 that supports continuous-tone (color and grey scale) image that is coded with baseline JPEG (T.81, lossy mode). Color space representation will follow the draft T.color. **TR-29/93-10-85R1** utilizes a data format for the image data file using the JPEG File Interchange Format (JFIF, **TR-29/93-10-JFIF**) with APPn markers.

**TR-29/93-10-86R1** is a liaison to the ANSI X3L3 JPEG ad hoc. It requests special identifiers in JPEG APPn Marker Segments for Facsimile Applications. This liaison requests the following markers:

- G3FAX1 for gamut range
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- G3FAX2 for illuminant data
- G3FAX3 through G3FAX255 for future use

TR-29/93-10-84R1 and TR-29/93-10-85R1 were supported unanimously as U.S. submissions to SG 8. TR-29/93-10-86R1 will be forwarded to X3L3.

A. Mutz noted that there is a proposal expected from the Japanese to SG 8 on the issue of default gamut range. It will propose a* range -100 to +100 and b* range -75 to +125. 1* range will remain 0 to +100. He sees no reason to oppose it.

TESTING

TR-29/93-10-114 is the current draft of PN-3194, Conformity Test Procedures for G3 Facsimile Devices. B. Boykin (Data Race) noted that the goal of this testing procedure should be improved interworking, not simply conformance. In this regard, he questioned the use of pass/fail nomenclature, noting that sometimes small deviations from T.4 and T.30 actually can provide broader interworking in certain cases.

TR-29/93-10-83 (A. Guiseppini, Q5 Rapporteur) reports on Tests for G3 facsimile at the Florence, Italy Q5/8 Rapporteur's meeting (September 20-22, 1993). At the meeting they reached agreement on the scope of their work.

Technical editor's note: While not reported at TR-29, the following are some significant items from the report of the Florence meeting which addressed facsimile security, tests for G3 facsimile and PSTN terminal selection:
- The Florence meeting agreed on the U.S. proposed position making the CNG signal mandatory even for manual calls.
- Draft V.8 (previously V.id) was reviewed but it was not clear to the committee how CNG is to be accommodated within the start-up procedures of V.8.
- Development of Annex D to T.30 continued with discussion on the duration of the OGM timer. L. McIntyre (Xerox) is to develop a further proposal for the SG 8 meeting.
- A liaison was sent to SG 1 regarding the restrictions on delayed answer of automatic terminals in Annex A of E.117 (see CSR 4.7, August, 1993, page 34 for additional information).

TR-29/93-10-99 (NIST) proposes a National Voluntary Conformity Assessment System Evaluation Program.

H. Silbiger introduced TR-29/93-10-89, Facsimile Quality of Service Aspects, as a proposed U.S. submission to SG 1. It notes the need for a definition of Telefax Quality of Service in proposed draft Recommendation F.fax and suggests making use of the work in SG 2 on facsimile/network performance. It was unanimously agreed that this paper be submitted to SG 1.

H. Silbiger also introduced for information TR-29/93-10-90, E.450 Facsimile Quality of Service on PSTN - General Aspects (draft), and TR-29/93-10-91 which includes E.456 (draft), Test Transactions for Facsimile Transmission Performance, and E.453, Facsimile Image Quality as Corrupted by Transmission-Induced Scan Line Errors.

OTHER BUSINESS

TR-29/93-10-98 is an excellent collection of papers (source AT&T, from A. Crossman, Chair of T1A1.6) for information on the performance and operation of V.29 facsimile on international circuits utilizing CME equipment. TR-29/93-10-98 was distributed but not discussed. TR-29/93-10-111 (same as D-35 previously submitted to SG 8) from COMSAT (T1A1.6) on the Impact of Transmission Delay on G3 facsimile was also distributed but not discussed.

TR-29/93-10-82 (D. Bodson, Rapporteur SG 8/Q6) was distributed for information. This White contribution to SG 8 presents a draft recommendation for a set of test images (originals of test images not included). The set consists of bi-level images, screened half-tone images, electronically dithered images, computer-generated images, grey scale images and color images.

It was noted that there are problems in the DIS/DTC tables of SP-2998 (U.S. version of T.30). It was agreed to review this and SP-2997 (U.S. T.4) after the TR-29 meeting.

TR-29/93-10-96 is a copy of a magazine article discussing the transmission of G3 facsimile over amateur radio bands. D. Bodson (NCS, and an active ham radio operator) is interested in determining if TR-29 would support this
work if he offered to be editor. Assuming D. Bodson is the editor, the TR-29 committee sees no problem supporting this effort.

Ken Krechmer, ACTION Consulting

TR-29.1 Binary File Transfer

P. Bogosian (Chair, TR-29.1) has completed final edits to the U.S. version of BFT and will submit them to TIA for publication.

TR-29.1/93-10-06, Suggestions on BFT (Vision 2000) proposes registering one OID for MIME (which has a central registration authority - IANA) and then carrying all binary files within the MIME envelop. TR-29.1/93-10-07, an e-mail letter from N. Koorland, provides information on the work in the EMA Message Attachment Group (MAWG). Currently the EMA only plans on publishing OID/MIME content-types, etc., not registering them. The paper provides a good overview of OID issues. D. Duehren noted that both contributions are for information.

H. Silbiger introduced TR-29.1/93-10-08, EMA Proposal for File Body Part Attributes, which reviews similar material as paper TR-29.1/93-10-07. P. Bogosian noted the work in EMA relates to the TR-29.1 work; he will send a letter to EMA noting the interest of TR-29.1.

TR-29.1/93-10-09 (M. Weinstein, Fisk Communications) defines BFT file attributes and gives examples. No familiarity with ASN.1 or FTAM is assumed.

P. Bogosian asked M. Weinstein to submit the parsing and source code for the next meeting.

P. Bogosian will look into finding available ASN.1 compilers. ASN.1 compilers that members know of:

- Open Systems Solutions, New Jersey
- Nokia, Finland

Fisk and Thought Communications will each contribute a BFT encoder for the next meeting. The chair requested that these encoders stay within the committee, so that no one implements them before the work is complete.

Profile Work

P. Bogosian suggested that we need a project statement for the profile work. No project number has been assigned. The project at a minimum should include one profile or a subset of attributes.

It is important to find out if a receiver supports file format or file before actually sending the file.

In ECM mode, only the last block can be terminated prematurely. A suggestion was made to send the file format stuff on the first page. It was agreed to look at diagnostic messages before looking at NSF.

P. Bogosian suggested resolving problems within the framework of BFT, rather than enhancing BFT. D. Duehren suggested that we use TSBs where necessary, rather than getting outside the scope of BFT.

R. Lutz (Cognisys) would like to know what value range is supported for a set of attributes to assist the PN-1906 work.

D. Duehren suggested a separate project to look at diagnostic messages, rather than link diagnostics to either of the other two suggested projects.

To register an object ID, one must register through ANSI to register it in the U.S. P. Bogosian will look into registration (time and cost factors, etc.). It was agreed that we should not have a separate object ID for objects that are registered through electronic mail groups (EMA).

After discussion, it was determined that TR-29.1 should open three projects:

1. Define one or more profiles
2. Resolve the Interoperability problem (potentially including: Encoding, Decoding, necessary negotiations)
3. Diagnostic Messages
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**PROJECT 1: RESOLVE THE PROFILES**

How many profiles, why, and what attributes?

A superset of attributes for first profile was agreed upon:

- Protocol Version
- Filename
- Contents type
- Date and time of last modification
- Filesize
- Private Use
- Application Reference
- Operating System
- Recipient (possible)
- Compression
- Environment (possible)
- Pathname (possible)
- User Visible String
- Data File Content

Papers are requested for the next meeting arguing for a tighter subset of the above superset.

R. Lutz suggested a recipe format for a string identifier.

J. Rafferty suggested looking at what EMA is doing, and then applying the recipe to the things they are doing. P. Bogosian will follow up with EMA.

**PROJECT 2: INTEROPERABILITY**

It would be desirable to have a TR-29.1 Compiler-Decompiler (Encoder/decoding) for producing a profile. Test suites are desirable also.

It was agreed that three areas will be addressed under Interoperability:

- Encoding/Decoding
- Framing, blocking, bit order
- Compatibility Testing

**PROJECT 3: DIAGNOSTIC MESSAGE ISSUES**

Diagnostic messages were not designed to tell you ahead of time this is what I can do, but to tell you after the fact that this is a problem.

D. Duehren would like to send a page of attributes and get back a diagnostic message.

It was agreed that this project should include:

1. How do you use diagnostic error messages?
2. Can it give a value range for a specific attribute?
3. Complete range of FTAM identifiers
4. Is there a message for the receiver to describe the value or range of values it would like to receive?

There is currently no framework defined for sending ranges of values.

R. Lutz volunteered to archive material including source code on his BBS (619 - 447-2223). This is not a public board, users will need a password, so source code is safe from public access.

**GETTING FILE DIAGNOSTICS BACK INTO ITU VERSION**

A contribution is needed to the ITU to explain why file diagnostics are desirable in T.434. It was decided to wait until there is more information/justification, and/or the file diagnostics are available.

It was noted that access control is also missing from T.434.

*Elaine Baskin, CSR*
COMMUNICATIONS STANDARD REVIEW

TR-29.2 FACSIMILE DIGITAL INTERFACE

LIAISON REPORTS

TR-30.4, DTE-DCE Protocols
L. Brown (Motorola) gave a report on TR-30.4’s three active projects. PN-2989, Extended DCE Functions, and PN-3147, Conversion of V.1m to SNMP MIB, are being harmonized so that there are AT commands corresponding to the managed objects. PN-2812, In Band Signaling, is out for industry ballot; there is a NO vote to resolve.

TR-45.3.2.5 and TR-45.5.1.5, Digital Cellular Data Services
These committees are working on circuit mode data services for TDMA and CDMA Digital Cellular systems. J. Decuir noted that work in these two committees was progressing. They both are awaiting PN-3129 (Class 2A) and PN-2989 (Extended DCE Functions) revisions.

PN-2987, CLASS 1A BALLOTS

Green letter ballot was mailed out as Draft Class 1A. TR-29.2/93-10-68 is summary of ballots received by the chair (J. Decuir). TR-29.2/93-10-69 is ballot comments from Data Race. C. Sneed of Rockwell, R. Lutz of Cognisys, L. Brown of Codex and H. Silbiger of AT&T had verbal comments.

Votes in hand: 8 Yes, 4 Yes with comments, 1 No with comments, 1 Abstention.

Motorola-UDS comments included in TR-29.2/93-10-68 were predominately editorial and were resolved.

Data Race comments in TR-29.2/93-10-69 were extensive and covered editorial and technical issues. The more significant technical issues are noted below:

- Item 2.7.5 through 2.7.8: New wording: “will recognize and replace &LSI;&LSI; with a single &LSI;” needs work; J. Decuir agreed to revise this.
- Item 2.8: As suggested, this seems to be a technical change to Class 1. Agreed to delete “,” and issues a CONNECT result code.” and replace with a period.
- Item 2.14.2: Replace the last paragraph of Section 8.3.6 with “The DCE shall enter command state, and return the OK result code, and may discard any buffered data.” B. Boykin will draft an additional warning.
- Item 2.15.1: There is a question about the state of optional parameters when +FCLASS is set to 1, either from a state where they are not defined (e.g., 0) or where they are (e.g., 2.0, 8). It was recommended that all editors in TR-29.2 get together and figure this out, since it applies to many projects within TR-29.2; this is not just a PN-2987 issue.
- Item 2.16.1: Serial port rate is fixed at the hexadecimal value, multiplied by 2400 bit/s. B. Boykin wants a table of common values in an informative area. J. Decuir will add a table.

PN-2987, CLASS 1A VERBAL COMMENTS

H. Silbiger, AT&T, regarding Section 2.1, asked for a Forward to indicate compatibility with previous standards. This Forward should indicate the intention to be compliant with the previous version, and why this new version is needed (the improvements, and where they are from). J. Decuir had planned to draft this Forward, since it is required by the Style Manual.

C. Sneed, Rockwell, would vote “No;” however, TR-29.2/93-10-69 seems to answer most of his issues.

Text is needed describing optional commands that are not supported. This language should go into Section 8.5.

Comments from L. Brown, Motorola Codex, were also considerable. The more significant ones are noted below:

- The +FTS and +FRS commands do not define silence (e.g., what power level, for how long). The committee did not agree to add definitions.
- An annex is needed to explain the use of the +FCERROR message,(8.4). B. Boykin will draft some material on the subject.

The editor noted that, with the range of changes and the no votes of Rockwell and DataRace, PN-2987 is not ready for SP-2987 ballot from this meeting.
B. Boykin suggested that another committee ballot between meetings would be desirable. He also noted that more rapid distribution of documents is needed.

Since the committee had not agreed on language for some unresolved issues, J. Decuir will consult with the objecting parties to propose some new language, and create a new draft to mail out to the membership.

**PN-3131, Voice DCE Control**

W. Pitkin, Sierra Semiconductor, is the editor of PN-3131.

**Voice Coding Presentations**

Y. Be’ery (DSP Group) presented TR-29.2/93-10-72 on the operation of TrueSpeech™. Gap coding and silence detection are optional functions. A. Mohr (DSP Group) demonstrated the TrueSpeech algorithm on two different systems: an i486 portable computer and on a proprietary chip with male and female talkers.

R. Lutz (Cognisys) presented TR-29.2/93-10-78, on Qualcomm’s QCELP. QCELP is a variable rate coder that supports silence detection and does not include timing marks. K. Krechmer questioned if Qualcomm is prepared to meet the ANSI IPR statement of reasonable and non-discriminatory. R. Lutz will check. It was noted that QCELP has been incorporated in TIA IS-96, an Interim Standard used for CDMA digital cellular. R. Lutz then played a tape of speech samples as a demonstration.

C. Sneed (Rockwell) presented TR-29.2/93-10-76 from Digital Voice Systems. This algorithm operates at 4.4 kbit/s.

TR-29.2/93-10-77 (C. Sneed, Rockwell, and M. Veeramoney, K. Mills, and C. Brabenac, Intel) is a description of DVI ADPCM in the form of the 17 committee questions.

TR-29.2/93-10-73 (J. Decuir, Microsoft) presents the differences between a GSM 6.10 codec and a TrueSpeech codec on an x86 PC. J. Decuir noted that the results included are not intended to represent the best possible, only an indication of operation. He did not know whether the tests of GSM were done under Windows. Y. Be’ery contacted Microsoft (G. Dahl) and identified that the Microsoft tests were done using a 386DX machine and that speech quality is the same as GSM. Gap coding is not supported as far as he knows in GSM.

**Summary of Submissions**

TR-29.2/93-10-79 (W. Pitkin, PN-3131 editor) is a chart of the algorithms submitted. The IMBE data rate was changed to 4.4 k, which is the data rate without error control. Points 2 and 3 are difficult to compare as different vendors interpreted the questions differently.

**Decision Criteria**

K. Krechmer suggested that there may be a need for more than one algorithm definition. Discussion ensued about whether or not a lowest common denominator is required or if the voice standard can support any of a defined number of algorithms. No agreement was reached.

TR-29.2/93-10-74 (excerpted from SG 15 TD-07 on audio coding) discusses various potential voice coders for a low bit rate video phone. TR-29.2/93-10-75 are papers from T1A1 that relate to the subject of low bit rate voice, including a T1A1 committee supported document that describes subjective audio testing techniques. C. Sneed (Rockwell) provided these papers for information.

TR-29.2/93-10-86, Voice/Data Service Classes (A. Clark, Hayes), suggests that five classes of voice and data integration exist (non-interactive alternate voice and data, interactive alternative voice and data and simultaneous voice and data of several types) and that this is a possible way to segment the work in PN-3131. It was agreed that this is out of scope of this project and should be forwarded to other standards bodies.

TR-29.2/93-10-87, Selection of speech compression technology (A. Mohr, DSP Group), notes that several voice compression standards have been considered in other standards bodies that are royalty-bearing. H. Silbiger believes that the work on PN-3131 needs to reference a public standard.

TR-29.2/93-10-88, Terms of Reference for selecting speech compression technology (A. Mohr, DSP Group), proposes a framework for choosing a compression technology. J. Decuir proposed that each committee member fill out the framework in TR-29.2/93-10-88 as a means to move towards agreement.
COMMUNICATIONS STANDARD REVIEW

K. Zhou (Intel) posed a series of questions: What are we trying to achieve? Do we still need to mandate on format? Do we have enough knowledge to make these decisions? Are we willing to do the effort to learn enough to do this? If we do, are we willing to lose our focus in the process?

B. Boykin and others are skeptical that TR-29.2 can agree on one format.

J. Decuir proposed a poll of the following questions:

1. Is it desirable to complete a voice compression standard?
   - The committee supported this.

2. What voice coding scheme should be mandated in PN-3131?
   1. nothing - 4 votes
   2. 1 voice-specific coding (e.g. GSM, etc.) - 3 votes
   3. 1 waveform coding scheme (e.g. ADPCM) - 4 votes
   4. 1 voice coding scheme, either voice-specific or waveform coding - 9 votes
   5. at least one of a small set of schemes (e.g., TrueSpeech or ADPCM) - 2 votes

He noted that there was still a large majority interested in developing a common mandatory voice coding scheme, so the project concept still had support.

Other Contributions

TR-29.2/93-10-80. Changes to Voice Commands for Mixed Voice/Data Support (R. Lutz, Cognisys), suggests that IS-101 be modified to support the Bellcore Analog Display Services Interface (ADSI). This is a good description of what is needed to include ADSI support in IS-101. However, it does not describe how a Bell 202 modem (used in ADSI) is supported. The committee supported the inclusion of the necessary syntax in IS-101 to support the ADSI indicator (CAS) and also suggested passing this document to TR-30.4, for information and for possible definition of a command set to support ADSI modems.

PN-3130, CLASS 4

B. Boykin presented TR-29.2/93-10-67, the Class 4 draft. He noted that the state tables should be reviewed closely. He illustrated the concepts with references to the sample sessions, particularly the TH State Table.

L. Brown suggested using SDL diagrams, for future international consideration. B. Boykin wants to stick with state tables for now, because they work and he understands them. J. Decuir supports this.

Note that <DLE><P> is used instead of <DLE><DLE> to code single <DLE> characters. There are 4 reserved characters. <11h> and <13h> are shielded in the data, so that all instances of these characters are flow control. <CAN> is also shielded, so that all instances of <CAN> are used as <CAN> only. There is no <DLE><SUB> here.

The format for description of directives was illustrated, using the TH directive. It includes function, syntax, valid values, example, and an application listed.

B. Boykin noted that many devices and FAX modems do not send HDLC abort before they drop carrier. The committee took no action.

This was drafted with many items represented by symbol; for example [DST] means Data Stream Terminator (currently <DLE><ETX>). Much of the material was inherited from previous drafts; B. Boykin, the editor, doesn’t fully understand it all.

B. Boykin notes that TIA-605 (Packet Protocol) will not work for PN-3130 as written, because it is half-duplex. The one described in IS-101 might work; this needs study.

B. Boykin asked for contributions on the other AT mode commands, and for missing text (e.g., section 3.2).

The editor will produce a new draft and mail it out to the committee.

PN-1906, FAX APPARATUS CONTROL

R. Lutz presented TR-29.2/93-10-81, a status report on PN-1906. He proposed an editing meeting in Newport Beach, CA, December 8 - 9, but there was insufficient interest.
COMMUNICATIONS STANDARDS REVIEW

TR-29.2/93-10-84 (R. Lutz, Cognisys) is a good review of the functions described in previous STF and Xerox submissions.

TR-29.2/93-10-82 (R. Lutz, Cognisys) describes the Operational Modes proposed. It proposes an emulation mode (behaves as existing devices) or integrated mode (new control functions) where functional subsystems operate concurrently under host control. R. Lutz indicated that the lowest level data type might be a raster scanned image.

PN-2725, SERVICE CLASS 3

TR-29.2/93-10-83 (J. Rafferty, Human Communications) proposes that the Class 3 project be merged into PN-1906. J. Rafferty offered to resign as Class 3 editor if the committee supported his suggestions. The committee agreed, but felt that it would keep PN-2725 open for the present.

PN-TBD, FACSIMILE DC E APPLICATIONS NOTES

The Scope of this project had been approved in TR-29.2/93-08-64 at the previous meeting, but neither the chair nor the editor (H. Silbiger) had filled out and submitted the project form to TIA. J. Decuir agreed to do this.

PN-3129, T.C CLASS 2

TR-29/93-10-92 is the White Paper that was submitted via Study Group D to ITU-TS SG 8. As agreed in August, it is an ITU-TS format version of TIA-605 and TIA-592 put together.

J. Decuir introduced TR-29.2/93-10-70, and proposed that it be submitted to SG 8 as a Delayed Contribution to support additions to TR-29/93-10-92 to bring it to the latest G3 revision levels (higher resolutions, new frames, T.30 Annex C [G3-64] and data formats). The committee reviewed this paper in some detail.

J. Decuir agreed to edit TR-29.2/93-10-70 to remove areas not supported in the latest T.4 and T.30 drafts and bring it to TR-29 for approval to be forwarded to SG 8. The revised document, TR-29/93-10-110, was approved by TR-29 to be forwarded to SG D and SG 8.

PN-3129, CLASS 2 REVISIONS

TR-29.2/93-10-71 (P. Sawyer, R. Scott Associates) suggests changes/clarifications to Class 2.1 (TR-29.2/93-08-50) to resolve issues associated with ECM, +FDM Response/+FDF Command and +FIS Response. The committee agreed to support the conclusions with some suggestions and asked P. Sawyer to draft the appropriate edits to the document.

Ken Krechmer, ACTION Consulting

TR-29.3, AUDIOGRAPHICS CONFERENCING

TR-29.3 is the U.S. TAG to SG 8 on audio graphics conferencing. T1A1.5 is the U.S. Tag to SG 15 in the same area. This causes overlapping efforts that are sometimes in conflict. Seeking to improve communication with T1A1.5, Polycom will attend the T1A1.5 San Jose meeting November 8 - 12, 1993, supplying for information the current drafts of T.S1 and T.124.

T.124 GENERIC CONFERENCE CONTROL

Members applauded the progress made by a team of editors led by J. Bernstein (PictureTel). The scope depicted in draft Rec. T.124 (TR-29.3/93-10-99) Figure 1-1 and the system model of Figure 6-2 were generally accepted.

Many issues in the definition of GCC (Generic Conference Control) services were discussed. Outcomes will be recorded in the ongoing issues list and in future document drafts. TR-29.3/93-10-100 is the draft GCC issues list dated October 13, 1993.

Further work is needed to specify aspects of a protocol that will realize the services.

TR-29.3/93-10-98 is the first draft of the Generic Application Template (T.GAT) from British Telecom. It was not discussed at this meeting.
COMMUNICATIONS STANDARD REVIEW

T.125 PROTOCOL SPECIFICATION

The editorial and technical changes proposed in TR-29.3/93-10-87, Editor's corrections to T.125 draft Recommendation T.125 (Multipoint Communications Service Protocol specification), are considered to meet the terms of WTSC Resolution 1. That is, they are justified, do not have a major impact on the intent of the recommendation, and do not depart from points of principle previously agreed.

Anonymix (Los Gatos, CA) demonstrated the SDT tool kit operation on the SCL reference implementation of appendices II-VI of T.125 (TR-29/93-10-87). They declared their interest in assisting the use of SDL in future standards.

T.123 PROTOCOL STACKS

The content of TR-29.3/93-10-91, Additional text on DLCI assignments to remove a defect in Recommendation T.123 - Protocol stacks for audiographic and audiovisual teleconferencing applications, was approved at the previous TR-29.3 and Q10/8 meeting. In TR-29.3/93-10-113, the U.S. declares its support for including this additional text in the published T.123 at the earliest opportunity. TR-29 approved TR-29.3/93-10-113 and combined it with the issue in TR-29.3/93-10-110 (see below) to become TR-29.3/93-10-118, a proposed submission to SG 8.

TR-29.3/93-10-103, Recommendation for T.123 clarifications (Polycom), concerns the protocol stack for PSTN. The two issues of TR-29.3/93-10-103 were separated into TR-29.3/93-10-110 (Clarification to Recommendation T.123 calling for asynchronous communications for the PSTN protocol stack) and TR-29.3/93-10-111 (Amendment to Recommendation T.123 relating to octet transparency). The latter suggests using an octet based transparency scheme rather than a bit based transparency scheme as it is easier and more computationally efficient. The issue in TR-29.3/93-10-111 was agreed to be technically sound but too late, since it is reasonable to implement T.123 as it stands.

The clarification in TR-29.3/93-10-110 was supported as a U.S. position from TR-29 in TR-29/93-10-117 (and merged into TR-29.3/93-10-118), since it required clarifying but not amending T.123, and failure to act would exclude many personal computers with only a serial asynchronous interface.

TAAASIC STILL IMAGE APPLICATION

An urgent need is felt for a standard still image application. One factor is the demand from the video teleconferencing interests represented in SG 15. Another is the feeling shared by several members that a market cannot develop from incompatible proprietary software alone, because no single product will be so compelling as to capture all parties wishing to interact in a typical conference.

To resolve the confusion of several work items identified within SG 8 as dealing with still image transmission, T.AASIC will be renamed and promoted as the single candidate for the T.SI (T. Still Image) application. Its scope will continue to include optional annotation and other related useful functions. This is the subject of TR-29.3/93-10-109. Clarifications of work items regarding still image and annotation exchange. TR-29.3/93-10-109 was supported (with editing corrections) as a cover page to the T.SI document. TR-29.3/93-10-104 is the draft of T.AASIC that will be updated.

Issues raised with T.AASIC (TR-29.3/93-10-104), including those of TR-29.3/93-10-105 (Comments on T.AASIC from British Telecom), were discussed over several days. Items that may require further investigation include:

- Ensuring that receivers stay in sync when an image transmission is aborted
- Operations to copy between cached workspaces
- An appropriate existing standard for vector-drawn images
- Whether a file format should be defined for preshipped images
- The range of allowed pixel aspect ratios

TR-29.3/93-10-94, Liaison from SG 15 to SG 8 concerning Still Image Application, states that mandatory JBIG is incompatible with the technical characteristics of H.320. It was decided to keep baseline JBIG as part of T.SI that is mandatory for receivers. As noted in a liaison to T1A1.5 (TR-29.3/93-10-115), JBIG is felt to be compatible with H.320 terminals and the best choice for document transmission. This liaison with suggested editing was approved for transmission from TR-29 to T1A1.5 as TR-29/93-10-118 and was edited further to become TR-29.3/93-10-119.
COMMUNICATIONS STANDARDS REVIEW

The authors of T.SI will investigate uses of JPEG that have been proposed in other standards, to increase compatibility and to benefit from work already done. The inclination is to require explicit Huffman coding and quantization tables with each image instead of relying on defaults.

**TR-29/93-10-96** is the Japanese SG 15 contribution, Protocols for JPEG Still Picture Transmission Through LSD and HSD. **TR-29/93-10-96** supports specific JPEG parameter limits (video oriented color space) as a baseline. The direction of TR-29.3 (predominately terminal manufacturers) requires more flexibility. This discussion is expected to continue with more participants in Geneva.

Polycom has supplied the algorithm in **TR-29.3/93-10-102**, Palette Generator for Bitplane Progressive Transmission, for free and unrestricted use within the T.AASIC recommendation (T.SI). It transcodes a palettized image in preparation for its transmission in successive bit planes, with intermediate results that closely approximate the final full image.

**OTHER BUSINESS**

Liaison **TR-29.3/93-10-90** (supporting the use of JBIG for document image coding) from the previous TR-29.3 and Q10/8 meeting was delivered to SG 15 without an accompanying draft of T.AASIC, thereby reducing its effectiveness. The SG 15 response will be a replay of **TR-29.3/93-10-94** (Liaison from Q3/15 to Q10/8, September, 1993).

Drafts **TR-29.3/93-10-92** (A data link layer [H.DLL] protocol for video conferences using the H.221 LSD/HSD/MLP channels) and **TR-29.3/93-10-93** (A far end camera control [H.FECC] protocol for video conferences using H.DLL), proposed for Resolution 1 at the May 1994 meeting of SG 15, were distributed for information. **TR-29.3/93-10-95** (Q3/15’s Reply to Liaison from SG 8 on Simplex protocols for use on LSD and HSD channels with H.243 broadcast) will be answered at the November meeting of SG 8.

**TR-29.3/93-10-107** is a liaison to ANSI T1A1.5 from the May, 1993 TR-29.3 meeting. It notes the problems when transferring G3 facsimile using remode over a one directional narrow band channel. It prompted T1A1.5 to generate a reply which has not been formally received. A draft of the expected reply is **TR-29/93-10-97**, with **TR-29.3/93-10-114** attached. **TR-29.3/93-10-114**, a SG 15 contribution (Com 15-29) from July 1993, details the operation of H.320 video with G3 facsimile terminals.

**TR-29.3/93-10-116**, a proposed TR-29 liaison to T1A1.5, describes problems experienced while trying to coordinate with T1A1.5 on topics affecting both telematics and video conferencing, particularly in terms of U.S. submissions to ITU-T. This document makes strong statements on the problems caused by lack of coordination in the U.S. This was discussed at TR-29 as **TR-29/93-10-119** and approved for submission to U.S. SG C and D and T1A1. Final copy appears in **TR-29.3/93-10-116R**.

The TR-29.3 work schedule is tied to SG 8 meetings; its goals are for T.124 and T.SI to be declared stable for Resolution 1 processing in June, 1994. T.125 is already proposed for voting under Resolution 1 at SG 8 on November 25, 1993.

Members were reminded in **TR-29.3/93-10-117** (TR-29.3 Electronic Distribution guidelines) that working documents will continue to be posted between meetings: on the Worldinx bulletin board (416 890-3624, contact Steve Madden, 416 757-4100) and the ConferTech anonymous FTP site ftp.cfer.com (contact Glenn Russell, 303 633-3212).

Licensing terms for JBIG baseline patents are described in **TR-29.3/93-10-101** from Polycom.

*Terry G. Lyons, AT&T*

**TR-29.4 Secure Facsimile Committee Meeting**

**161D Document Status**

Subsequent to the last meeting, G. Constantinou had requested that JITC technical editors prepare a revised 161D protocol enhancement document based on the committee inputs contained in **TR-29.4/93-01-5** (resubmitted to this meeting and numbered **TR-29.4/93-10-19**). **TR-29.4/93-10-19** was discussed during the meeting and a number of changes were suggested including definition of the CRC to be used. JITC will incorporate these changes during the next few weeks and will circulate them for one last committee review. G. Constantinou will then submit the enhancement to DoD to start the approval process toward formal release of MIL-STD-188-161D. It is expected
COMMUNICATIONS STANDARD REVIEW

that this release will occur during the first quarter of 1994, assuming that the 161D testing being conducted by JITC yields positive results.

**VENDOR 161D TESTING**

One vendor, Ricoh Corporation, has implemented the 161D protocol to include 10 msec scan line, 200 x 200 resolution, two dimensional encoding, page acknowledgment and terminal ID. Ricoh has conducted backwards interoperability testing with several Ricoh products and also other vendors’ products operating in the 161B/C mode. No interoperability problems were discovered.

**JITC 161D TESTING**

Two Ricoh facsimile machines with the 161D protocol are currently being tested by JITC for conformance to the proposed standard, bit error rate performance and interoperability with existing 161 compliant machines. Compliance with the protocol and timing parameters are being tested. Limits testing is not within the current scope of the test bed. The preliminary test results are contained in **TR-29.4/93-10-20**. The preliminary conclusion is that the proposed 161D protocol appears to meet the design objectives. JITC is hoping to receive another vendor’s machine with 161D so that interoperability testing can be performed between the two vendors’ equipment before the end of the calendar year.

**MIL-STD-188-161C ENDORSEMENT**

The Joint Interoperability and Engineering Organization (JIEO) Center for Standards circulated a memorandum in May, 1993 (**TR-29.4/93-10-21**), which recommends that the Type 1 and Type 2 digital interfaces documented in MIL-STD-188-161C be specified in all future DoD facsimile procurements whenever a digital signal is required. G. Constantinou is trying to get a similar directive from a higher level in the Government to further promote the use of the 161 protocol and to stress that there is no equivalent commercial “off-the-shelf” standard.

**161C STANDARDS CONFORMANCE TEST**

JITC has a 161C Standards Conformance Test that vendors may contract to have performed; successful machines will be listed in a data base which is accessible to Government organizations. Interoperability testing with other 161C approved machines and with various types of transmission media and security equipment is included in the testing.

It has been determined that none of the tested secure fax machines currently are fully compliant with MIL-STD-188-114A which is a mandatory requirement of 161C. The recommendation given to G. Constantinou is that either 114A should be eliminated from the 161C specification or that vendors be given a grace period in which to become compliant, and also that send common, receive common and loss of sync be eliminated from Table 1 of 161C as well as making Loss of Sync an option in Paragraph 5.2.4.

**161 TRANSMIT DEFAULT MODE**

The proposal was made at the last meeting that 161/handshake/ compressed/no-FEC be the prime transmit default mode on new 161 interoperable facsimile machines. Vendor inputs were solicited. G. Gavenman (Ricoh) suggested that after 161D is available, Government network coordinators should just set all of their units in the network to 161 default mode to promote the use of the standard. G. Weide (Boeing/NASA) indicated that he was already implementing that procedure in the NASA secure network.

**MODIFIED GROUP 3 COMMON SET OF TERMS**

A proposal from the last meeting suggested standardizing on a set of terms for the modified Group 3 modes and incorporating them into the 161C appendix. The general consensus during this meeting was that these terms should not be incorporated since the modified Group 3 modes were not part of the 161C specification.

**FACSIMILE FUTURE CAPABILITIES LIST FOR THE GOVERNMENT**

G. Constantinou is collecting information from the DoD facsimile working group regarding desired future capabilities. The initial inputs are for interfacing fax machines to PCs and operation at higher speeds. G. Constantinou indicated that there was no clear information yet, but that he hoped to have a more defined direction by the November meeting.
COMMUNICATIONS STANDARDS REVIEW

The JIEO Center for Standards contracted for a comparison study between the Group 3/64 kbit/s standard and the Group 4 standard (TR-29.4/93-10-22) to help select the one better suited for the military. It was determined that the Group 3/64 standard was the better choice for higher noise environments and transmissions via satellite.

The Government working group members of MIL-STD-188-161 have agreed to eventually adopt the Group 3/64 standard for non-tactical applications. For tactical applications, the Group 3/64 machines will need to interface with the 161C standard. Based on the study report, G. Constantinou indicated that the NATO facsimile working group has placed their activities regarding the Group 4 standard on hold until completion of further investigation of the Group 3/64 standard.

A question was raised in the TR-29 plenary session regarding potential suppliers of Group 3/64 facsimile machines. The answer was that several companies are working on machines, but that no announcements have been made yet. G. Constantinou would like to test some of these machines when they become available.

COMMERCIAL TYPE ENCRYPTION

To date no one has indicated an interest in sponsoring a commercial facsimile privacy project; however, the committee has continued to collect information regarding commercial encryption alternatives. G. Weide attended a conference in August where voice and data encryption alternatives were discussed. The Clinton administration is promoting protection of unclassified but sensitive information.

One technology involves a Clipper chip or Capstone chip and Skipjack encryption algorithm developed by NSA. The government is proposing to name this work Escrow Encryption Standard (EES). It is forecast that this technology will replace DES in three to five years. However, the DES encryption standard has been renewed for an additional 5 years. The Clipper or Capstone chips can be embedded into the equipment to provide end-to-end protection. Currently, law enforcement agencies under court order do have the capability to “unlock” the encryption system to allow eavesdropping. The two authorized government agencies are Treasury and NIST. This capability is being questioned by users, especially foreign, who do not want this type of access to the encryption algorithm. Concerns about export or off-shore manufacturer can be directed to Jimmy Dolphine of NSA 301 688-4260.

The RSA public-key system is an alternate encryption scheme which has been used for cellular phones and is under study for many other applications. It may be recommended for work going on in TR-30.1. It is a software approach and therefore is potential less expensive to license than the cost of a chip. Clipper chips, however, in quantity may be only around $30 each.

Bob Robinson, Ilex Systems
COMMUNICATIONS STANDARD REVIEW

TR-29 ROSTER, OCTOBER 18 – 21, 1993, SUNNYVALE, CALIFORNIA

Steve Urban, Delta Information Systems Chair, TR-29
Philip Bogosian, Thought Communications Chair, TR-29.1
Joe Decuir, Microsoft Chair, TR-29.2
Bruce DeGrasse, BJ Communications Chair, TR-29.3
Bob Robinson, Ilex Systems Chair, TR-29.4
Hosts: Communications Standards Review
Gammalink
Polycom
Sierra Semiconductor

ACTION Consulting Ken Krechmer
Apple Computer Olivier Mardinian
AT&T Terry Lyons
AT&T Herman Silbiger
AT&T Paradyne Joe Chapman
Bellcore Angela Liu
Bellcore Rand Sherman
Boeing/NASA George Weide
Brooktrout David Duchren
BT John Bohiner
BT Labs Dave Lewis
BT Labs Trevor Peers
Cirrus Logic Mike Wytyshyn
Cognisys Raymond Lutz
CSR Elaine Baskin
Compaq Edward Newman
Compression Labs Dan Klenke
Confortech Glenn Russell
DBT Matthias Frey
Data Beam Neil Starkey
Data Race Bob Boykin
Dialogic Bill Tiso
DoD/JIEO George Constantinou
DSP Group Yair Be’ery
DSP Group Sandra Huang
DSP Group Asaf Mohr
FISK Communications Alan Arner
FISK Communications Mark Weinstein
France Telecom Rodolphe Goldstein
Gammalink Hank Magnuski
Gammalink Jeanne Schmitt
Gammalink Mike Spann
Genoa Technology Mike Moldovan
Hayes Alan Clark
Henderson Comm. Warren Henderson

Hewlett Packard Daniel Lee
Hewlett Packard Scott Roleson
High Tide Software Michelle Miller
Human Comm. James Rafferty
Ilex Systems John Munch
Intel Kecheng Zhou
JIEO/JITC C3A-TCCA Don Poling
Mantech/Interop James Tomko
Motorola Codex Les Brown
Motorola UDS Fred Killmeyer
MultiLink Arthur Leonidres
National Semiconductor Yuval Shachar
National Semiconductor Chris Stacey
NCS Stephen Perschau
Octus Dan Ohlemacher
Patrick Cook Resources Bob Cook
PictureTel Jeff Bernstein
Polycom Addie Gisser
Polycom Pat Romano
R. Scott Associates Paul Sawyer
Ricoh Corporation Gene Gavenman
Rockwell Glen Griffith
Rockwell Chris Sneed
Satchell Evaluations Stephen Satchell
Sierra Semiconductor David Long
Sierra Semiconductor Ward Pitkin
TDK/Silicon Systems Carrie Manis
TDK/Silicon Systems Neil Wiseman
TSP/GTE Chuck Grandgent
VideoServer Bruce Kravitz
VTel Brian Daniels
WorldLinx Telecomm. Steve Madden
Xerox Vivian Cancio
Xircom Ian Seacombe
### Acronym Definitions

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<th>Description</th>
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<td>ADPCM</td>
<td>Adaptive Differential PCM</td>
</tr>
<tr>
<td>ADSI</td>
<td>Analog Display Services Interface (Bellcore)</td>
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<td>AIIM</td>
<td>Association for Information and Image Management</td>
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<tr>
<td>AMPS</td>
<td>Advanced Mobile Phone Service</td>
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<tr>
<td>ANSI</td>
<td>American National Standards Institute</td>
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<tr>
<td>ATM</td>
<td>Asynchronous Transfer Mode</td>
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<tr>
<td>BFT</td>
<td>Binary File Transfer</td>
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<tr>
<td>BS</td>
<td>Base Station</td>
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<tr>
<td>CCIR</td>
<td>Consultative Committee International Radio</td>
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<td>CDMA</td>
<td>Code Division Multiple Access</td>
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<tr>
<td>CMMRD</td>
<td>Cellular Microcell/Microsystem Requirements Document</td>
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<td>T.30 Calling Tone</td>
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<td>CNIP</td>
<td>Calling Number Identification Presentation</td>
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<td>CNIR</td>
<td>Calling Number Identification Restriction</td>
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<td>CRC</td>
<td>Cyclic Redundancy Code</td>
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<td>Communications Standards Review</td>
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<td>CTIA</td>
<td>Cellular Telecom. Industry Association</td>
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<td>DCC</td>
<td>Digital Control Channel</td>
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<td>DCE</td>
<td>Data Circuit Terminating Equipment</td>
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<td>DCME</td>
<td>Digital Circuit Multiplication Equipment</td>
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<td>DES</td>
<td>Data Encryption Standard</td>
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<td>DLCI</td>
<td>Data Link Connection Identifier</td>
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<td>DMH</td>
<td>Data Message Handler</td>
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<td>DTMF</td>
<td>Dual Tone Multi Frequency</td>
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<td>EEC</td>
<td>Escrow Encryption Standard</td>
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<td>EM</td>
<td>Electromagnetic</td>
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<td>HDLC</td>
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<td>HLC</td>
<td>Higher Layer Compatibility</td>
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<td>HLR</td>
<td>Home Location Register</td>
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<td>HSD</td>
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<td>I.CFA</td>
<td>International Computer Facsimile Association</td>
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<tr>
<td>IPR</td>
<td>Intellectual Property Rights</td>
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<td>ISDN</td>
<td>Integrated Services Digital Network</td>
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<td>ISO</td>
<td>International Standards Organization</td>
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<td>JFIF</td>
<td>JPEG File Interchange Format</td>
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<td>JITC</td>
<td>Joint Interoperability Test Center</td>
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<td>JPEG</td>
<td>Joint Photographic Experts Group</td>
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<td>MAC</td>
<td>Media Access Control</td>
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<td>MIB</td>
<td>Management Information Base</td>
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<td>Acronym</td>
<td>Description</td>
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<td>MIN</td>
<td>Mobile Identification Number</td>
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<td>MultiLayer Protocol</td>
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<td>Mobility Management</td>
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<td>MPEG</td>
<td>Motion Picture Experts Group</td>
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<td>MSC</td>
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<td>MT2</td>
<td>Cellular User's Mobile Termination</td>
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<td>MWN</td>
<td>Message Waiting Notification</td>
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<td>NAM</td>
<td>Number Assignment Module</td>
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<td>NAMPS</td>
<td>Narrowband AMPS</td>
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<tr>
<td>NRM</td>
<td>Network Reference Model</td>
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<tr>
<td>NSF</td>
<td>Non Standard Facilities</td>
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<tr>
<td>ODA</td>
<td>Open Document Architecture</td>
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<tr>
<td>OGM</td>
<td>Out-Going Message</td>
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<td>PACA</td>
<td>Priority Access and Channel Assignment</td>
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<td>RFI</td>
<td>Radio Frequency Interference</td>
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<td>Radio Link Protocols</td>
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<tr>
<td>SCA</td>
<td>Selective Call Acceptance</td>
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<tr>
<td>SDL</td>
<td>Specification and Description Language</td>
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<tr>
<td>SG</td>
<td>Study Group (ITU, CCITT)</td>
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<td>SNMP</td>
<td>Simple Network Management Protocol</td>
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<td>TAG</td>
<td>Technical Advisory Group</td>
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<td>Transaction Capabilities Application Part</td>
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<td>TDMA</td>
<td>Time Division Multiple Access</td>
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<tr>
<td>TIA</td>
<td>Telecommunications Industry Association</td>
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<tr>
<td>TLDN</td>
<td>Temporary Local Directory Number</td>
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<tr>
<td>TSB</td>
<td>Telecommunication Systems Bulletin (TIA)</td>
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<tr>
<td>WTSC</td>
<td>World Telecommunication Standardization Conference</td>
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## Communications Standards Review

### 1994 Meeting Schedules as of October 27, 1993

Subject to Change without Notice

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<tr>
<th>Meeting Code</th>
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<tr>
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<td>Dallas, TX</td>
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<td>V.34 Rap Jan 17 - 18</td>
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<td>TR-46 Jan 17 - 21</td>
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<td>T1A1 Jan 17 - 21</td>
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<td>TR-29 Jan 31-Feb 3</td>
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<td>T1P1 Feb 7 - 11</td>
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<td>TR-46 Feb 28-Mar 4</td>
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<td>TR-41 Mar 7 - 11</td>
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<td>TR-46.3 Mar 21 - 25</td>
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<td>JTC(Air) Mar 21 - 25</td>
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<td>SG D May 11</td>
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<td>SG 15 May 16 - 20</td>
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<td>TR-46 May 16 - 20</td>
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<td>T1E1 Jun 6 - 10</td>
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<td>Montreal, Que</td>
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<td>SG 14 Jun 1 - 9</td>
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<td>SG 8 Jun 8 - 17</td>
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<tr>
<td>TR-41 Jun 20 - 24</td>
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<td>TR-46.3 Jun 20 - 24</td>
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<td>T1S1 Jul 11 - 15</td>
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## 1993 Meeting Schedules as of October 27

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<td>T1P1</td>
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<td>V.34 Rap.</td>
<td>Nov 8 - 9</td>
<td>Dublin, Ireland</td>
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<td>T1A1</td>
<td>Nov 8 - 12</td>
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<td>Hawaii</td>
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### Communications Standards Review

regularly covers the following committee meetings:

- **TIA (USA):** TR-29, TR-30, TR-41, TR-45, TR-46
- **ITU TS:** SG 8, SG 15 / 1, SG 14 (Formerly SGXVII)

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