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GRAND BROADCASTING CORPORATION

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RADIO ORDER

David A. Reams, President

June 17, 1994

JUN 20 1994

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W.
Washington, D.C. 20554

Re: COMMENTS OF GRAND BROADCASTING CORPORATION IN GEN. Doc. No. 94-33, FCC 94-101

Dear Mr. Caton:

Please find enclosed an original and seven copies of the above referenced COMMENTS. Please return a file stamped copy in the enclosed self addressed, postage prepaid envelope. Should you have any questions do not hesitate to contact the undersigned at the below specified address or telephone number.

Respectfully submitted,

David A. Reams

David A. Reams
President and General Counsel
Grand Broadcasting Corporation
P.O. Box 502
Perrysburg, Ohio 43552
419/666-8112

cc: w/enc. Lynn Remly, Esq.
Senior Attorney
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David R. Siddall
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Before The
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	GEN. Doc. No. 94-33
	)	
	)	FCC 94-101
	)	
Further Forbearance From	)	
Title II Regulation for	)	
Certain Types of Commercial	)	
Mobile Radio Service Providers	)	
	)	
	)	
	)	
Notice of Proposed Rule Making		

COMMENTS OF GRAND BROADCASTING CORPORATION

To: The Commission

Grand Broadcasting Corporation, hereinafter termed "Grand Broadcasting", by counsel and pursuant to the Commission's Notice of Proposed Rule Making ("NPRM") in the above captioned matter, hereby files Comments in response to the NPRM. These Comments address the issue of mobile service provider affiliation with a long distance service provider raised in the NPRM in terms of Grand Broadcasting's proposed INTERACTIVE BROADCAST RADIO SERVICE/MOBILE ELECTRONIC MAILBOX SERVICE*, hereinafter termed "IBRS/MEMS".

* Grand Broadcasting filed with the Commission a PETITION FOR RULEMAKING AND REQUEST FOR PIONEER'S PREFERENCE to establish an INTERACTIVE BROADCAST RADIO SERVICE ("IBRS"), hereinafter termed "Petition", which is pending in both GEN. Doc. Nos. 90-314 and 91-2. In a STATUS REPORT ON IBRS DEVELOPMENT filed in said dockets on August 27, 1993 (see copy attached hereto) Grand Broadcasting requested, if deemed appropriate, an expanded service allocation including IBRS such as mobile electronic mailbox service.

IBRS/MEMS is designed in the preferred embodiment

1) to interconnect with a long distance provider's X.400 based electronic mail network such as AT&T EASYLINK or Sprint Mail and, optionally,

2) to "piggy back" on top of the existing cellular radio infrastructure to maximize network and operational efficiencies.

SEE COMMENTS OF GRAND BROADCASTING CORPORATION in GEN. Doc. No. 93-252. Indeed, such IBRS/MEMS "piggy back" design further maximizes network and operational efficiencies by having the cellular radio service provider upon whose facilities IBRS/MEMS is "piggy backed" provide the non-IBRS/MEMS voice service described in the Petition (for MEMS the telephone number to be autodialed is stored in the RDPU described in the Petition rather than received as broadcast data as in IBRS). SEE COMMENTS OF GRAND BROADCASTING CORPORATION at p. 4, note in ET Doc. No. 93-266.

IBRS/MEMS INTERCONNECTED WITH A LONG DISTANCE CARRIER'S X.400 ELECTRONIC MAIL NETWORK IS PMRS.

In X.400 based electronic mail networking the degree to which a mobile service provider is interconnected to the public switched telephone network, which must be ascertained before determining Commercial Mobile Radio Service ("CMRS") classification, is determined by the X.400 based electronic mail network provider's, e.g. long

distance provider's, "connectivity matrix":

> "... X.400 is made up of separate networks managed by different organizations. Each of these networks is called an Administrative Management Domain, or ADMD. Usually a long-distance carrier or a government-owned telecommunications company owns an ADMD. ADMDs must bilaterally agree to be connected to one another, and not all ADMDs are interconnected."

Looking before you leap Linking LAN-based E-mail to public mail services takes planning and patience, Kent, L., p. 48, INFOWORLD, February 28, 1994. In contrast, with Internet and other traditionally non-X.400 based electronic mail networking the degree of interconnection is equivalent to public switched telephone network connectivity: "The Internet is a single interconnected network. Once connected, you can send mail to anyone without restriction." Id. It should be noted here that Internet is introducing X.400 based electronic mail networking, including X.435 based electronic data interchange ("EDI"). SEE Do You Still Need A VAN For EDI?, p. 60, DATAMATION, May 1, 1994 ("... as the Internet later this year begins to accommodate EDI transactions for as little as $20 to $30 a month, the VANS will have to 'think twice' about their pricing.").

IBRS/MEMS mobile service provider affiliation with a non-X.400 based electronic mail network operator will result in

> 1) public network interconnection and service availability to a substantial portion of the public warranting CMRS status and
>
> 2) "benefits of scale and scope" combined with some "vertical integration", which may not warrant maximum regulatory forbearance.

NPRM at 59 FR 25435.

X.400 electronic mail network interconnection, however, results in neither public network interconnection nor service availability to a substantial portion of the public. Indeed, presently some medium sized businesses cannot even afford the expensive X.400 electronic mail network access afforded by VANS. Consequently, IBRS/MEMS mobile service provider affiliation/interconnection with X.400 based electronic mail network providers should result in IBRS/MEMS being classified as Private Mobile Radio Service ("PMRS"). Likewise, such PMRS classification should result from IBRS/MEMS mobile service provider affiliation/interconnection with private X.400 based electronic mail networks ("Private Management Domains"), which include "Value-Added Banks" that combine the functions of EDI capable banks (converting X12 and EDIFACT

transactions to/from ACH transactions) with VANS in a single provider. Just What is a VAN?, Gregory, T.A., EDI WORLD, p. 40, February, 1993.

Due to this dichotomy between X.400 and other electronic mail networking and the resulting variance in CMRS and related regulatory status, Grand Broadcasting hereby requests that IBRS/MEMS be classified as CMRS only if interconnected with a non-X.400 based electronic mail network operator; as PMRS if interconnected with an X.400 based electronic mail network.* In conclusion, regulatory classification of (and - if CMRS - forbearance concerning) mobile electronic mail service offerings that are interconnected with long distance carrier electronic mail networks must be based on the degree of connectivity afforded by the long distance carrier: with non-X.400 electronic mail network connectivity the interconnection afforded by the long distance carrier electronic mail network operator is "interconnected service", pursuant to the Commission's Order at 59 FR 18494, equivalent to the

* The Commission rejected Grand Broadcasting's request based on the store and forward nature of electronic mail that IBRS/MEMS be classified as PMRS. Compare COMMENTS OF GRAND BROADCASTING CORPORATION at 2 in GEN. Doc. No. 93-252 with the Commission ORDER at 59 FR 18494 in GEN. Doc. No. 93-252, hereinafter termed "Order". Said bifurcated regulatory classification for IBRS/MEMS - CMRS for non-X.400 electronic mail network interconnection and PMRS for X.400 electronic mail network interconnection - is analogous to the bifurcated public/private PCS regulatory classification enunciated in the Commission's Order at 59 FR 18494.

degree of interconnection provided by the public switched telephone network and a substantial portion of the public have access to the mobile electronic mail service offering; in contrast, with X.400 electronic mail network connectivity the interconnection afforded by the long distance carrier is restricted, is not equivalent to said "interconnected service" and does not provide a substantial portion of the public access to the mobile electronic mail service offering.

Respectfully submitted,

David A. Reams

David A. Reams
President and General Counsel
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RADIO ORDER

David A. Reams, President

August 27, 1993

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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W., Room 222
Washington, D.C. 20554

Re: STATUS REPORT ON IBRS DEVELOPMENT;
GEN. DOCKET NOS. 90-314 AND 91-2

Dear Mr. Caton:

Please find enclosed an original and seven copies of Grand Broadcasting Corporation's STATUS REPORT ON IBRS DEVELOPMENT submitted in the above referenced proceedings as either duly filed or ex parte submission. This REPORT is intended to briefly inform the Commission of the dynamic time division multiplexing efficiencies inherent in Grand Broadcasting's IBRS proposed system and in particular said efficiencies in requested spectrum 940.5-941 MHz.

Actual radio frequency transmission in this band, although initially contemplated, has not been conducted. Grand Broadcasting has, however, submitted substantial development work and technical feasibility demonstration, based largely on a still pending patent and EDI pioneering, which warrant a pioneer's preference should the Commission authorize IBRS or an expanded allocation including IBRS.

David A. Reams

David A. Reams
President
Grand Broadcasting Corp.

Certificate of Service

I hereby certify that on this 27th day of August, 1993 a copy of this filing was mailed to the parties participating in the Agency proceedings in Gen. Doc. Nos. 90-314 & 91-2.

David A. Reams

David A. Reams

cc: Honorable James H. Quello, Acting Chairman, FCC
Honorable Andrew C. Barrett, Commissioner, FCC
Honorable Ervin S. Duggan, Commissioner, FCC
David R. Siddall, Chief, Frequency Allocations Branch, FCC

STATUS REPORT ON IBRS DEVELOPMENT

This REPORT is respectfully submitted as a brief statement on the dynamic time division multiplexing efficiencies inherent in Grand Broadcasting Corporation's (Grand Broadcasting) INTERACTIVE BROADCAST RADIO SERVICE (IBRS) proposed system. Such efficiencies will be particularly realized by combining Asynchronous Time Division Multiplexing (see discussed below) in narrowband 900 MHz frequency with the highly efficient, FDM-style embedded method of broadcasting data, which method was successfully tested as described in the Initial Tone Broadcast Study appended to a letter dated March 23, 1993 to the Commission concerning this proceeding.

Simply stated, the requested IBRS radio frequency will do for the broadcast radio industry what cellular radio did for the mobile communications industry and what EDI is currently doing for the airline industry (see appended TELECOMMUNICATIONS article entitled "Pioneering OSI in the Air Transport Industry"). Such IBRS spectrum will bring unprecedented growth in the local radio marketplace through heralding in revolutionary wireless-broadcast radio applications, such as Electronic Data Interchange (EDI) proposed by Grand Broadcasting.

Grand Broadcasting's TDM IBRS system design is an ideal environment for developing EDI, which is enormously economical and remarkable in functionality yet still limited exclusively to commercial applications. For

example, EDI Transaction Set 850 for Purchase Orders can readily be adapted to electronic ordering over IBRS. (See ENGINEERING EXHIBIT 1 appended to Grand Broadcasting's PETITION FOR RULE MAKING AND REQUEST FOR PIONEER'S PREFERENCE in this proceeding). All of the ordering information going into consumer transactions, such as price, quantity, colors, measurements, etc., is already formatted in Transaction Set 850. Further, combining easy to use push button responses with speech synthesizer delivered questions concerning product/service attributes will greatly facilitate entering such ordering information.

Turning to the other EDI Transaction Set planned by Grand Broadcasting for IBRS, Transaction Set 841 for multimedia applications promises to quickly bring digital audio, graphic display and text applications to local radio broadcasters. Indeed, radio listeners, through mobile access to an electronic mailbox clearinghouse, will come to use their radios as a multimedia medium for depositing and retrieving a wide variety of messages.

As indicated, TDM, in a conventional trunked communications network, will identify RDPUs/radio listeners as time slots to the EDI clearinghouse. A relatively low TDM transmission rate, such as 4800 bps, will enable greater time slots per subframe and more users per cell site. Further, deploying Asynchronous Time Division Multiplexing (ATDM and also known as statistical

multiplexing) between the RDPU and the receiving EDI clearinghouse will result in empty frames being removed from the data stream, thereby minimizing spectrum usage while improving system throughput.

In addition, by selectively breaking the Consumer Response Code Format (Figure 4 in the pending patent appended to Grand Broadcasting's PETITION) into frames, maximum compression will be achieved. For example, a product/service attribute time frame in a product/service identification code may be created. Since this frame, however, may sometimes be empty for products/services not having any special attributes for electronic ordering, this is an ideal candidate for a sub-frame. By using this variation of ATDM a parallel signal is received, thus speeding transmission.

Certain data frames that fall within Transaction Set specifications will correspond to EDI coding to maximize EDI processing at the clearinghouse. The use of EDI will mean that producers of announcements and commercials will receive EDI product/service identifiers from a host system administrator prior to creating their materials for airing. The product/service identifier will also contain a sub-frame which will indicate if there is a quantity or time selection, or other attribute specification, to be made, such as times available for dinner reservation or quantities available for electronic ordering of roses.

When the attribute field contains valid data, the RDPU will use speech synthesis means to ask the user to press button one when the desired attribute is announced. The RDPU can then confirm by repeating the question.

In conclusion, Grand Broadcasting proposes to use an extremely efficient method of broadcasting data that encodes program elements when originally recorded, enables full participation by AM radio stations in IBRS and has been successfully tested by Grand Broadcasting. Grand Broadcasting proposes to combine this embedded method of broadcasting data with highly efficient and proven TDM communications to most efficiently bring untapped interactive broadcast radio and EDI capabilities, world class capabilities, to American consumers. To provide an economical and highly functional link to such digital, interactive and multimedia marketplace, Grand Broadcasting respectfully requests an allocation of 940-941 MHz for IBRS or, if deemed appropriate, an expanded service concept including IBRS such as mobile electronic mailbox service.

Pioneering OSI in the Air Transport Industry

As one of the first industries with a pressing need to communicate between companies and across borders, the air transport industry was forced to develop standards long before most industries had even conceived of the need to do so.

Henry Zalman

Although airlines now compete very aggressively, they also provide computerized access to each other's services, including reservations and ticketing. Thus, there is a strong interdependency between fierce competitors. Because of this, perhaps, the industry as a whole has shown a remarkable degree of cooperation for development of standard protocols. Much of this work has been done through the International Air Transport Association (IATA), a trade organization representing the interests of the air transport industry worldwide. IATA serves not only regularly scheduled airlines, but charters and cargo operations as well. Development of standards and products for airline IT is an important part of its work.

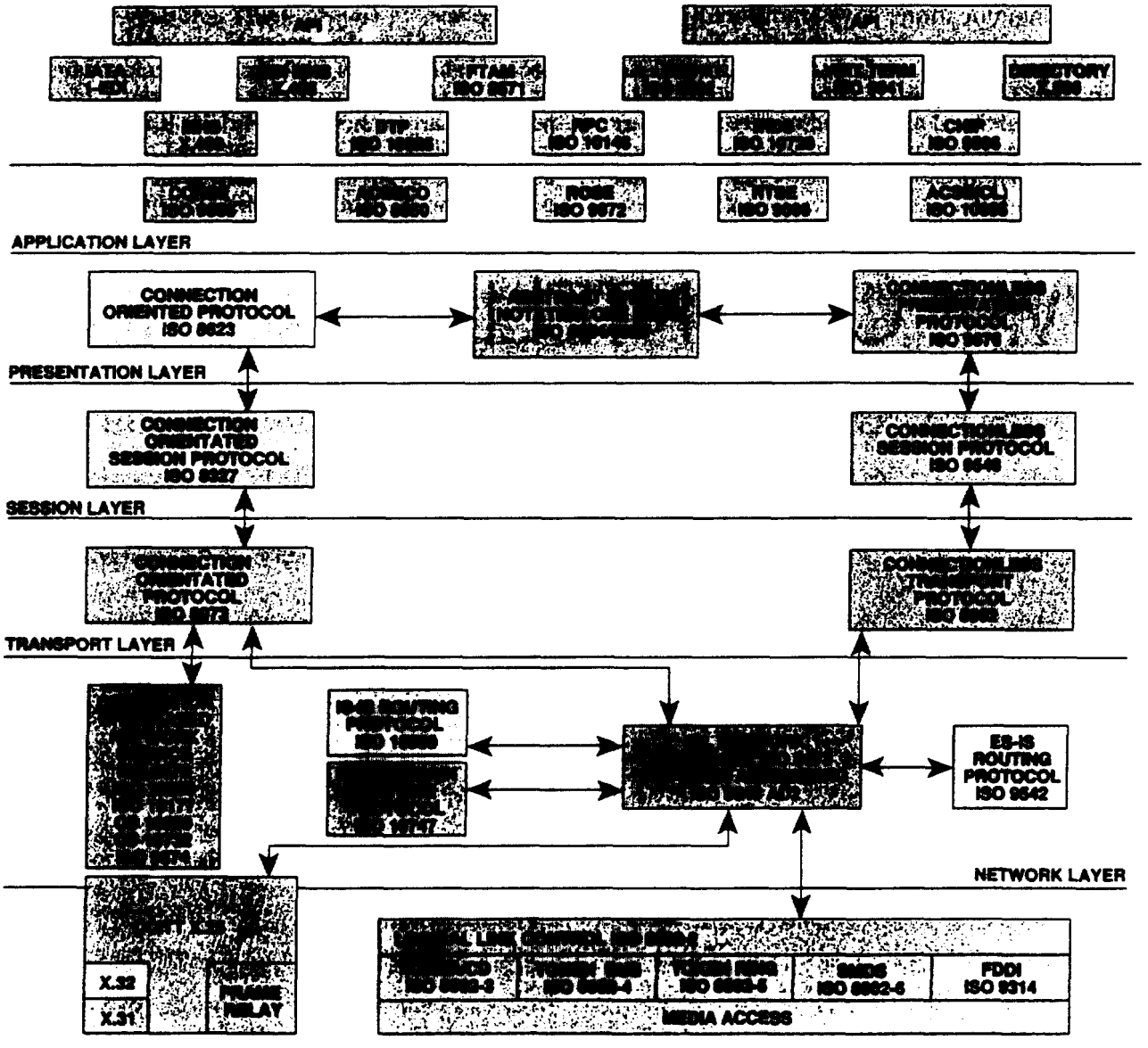

Fig. 1 Aeronautical OSI architecture

AIRLINE INDUSTRY

As early as 1951, IATA produced a handbook called the Interline Communications Manual (ICM), which has long served as the bible of airline communications standards. Still in print it has been updated over the years to reflect the changes and improvements made in airline networks. The ICM is concerned with message compositions and handling procedures, control procedures, character sets, message structure, and higher layer protocols. It is supplemented by several other documents that describe, among other things, the use of packet networks and implementation of high level protocols.

Due to the specific needs of airlines, these protocols are specialized for the industry. The emphasis is on robust and reliable transfer of data, since many airlines operate in countries that do not have the most modern or reliable telecom networks.

MIGRATION TO OSI

As the air transport industry deals with the challenges of the 1990s, it is becoming evident that the existing communications protocols, although reliable, cannot serve the changing needs of the industry. For one thing, communications have traditionally been closed, and there is a growing realization in the industry that they need to open up. In particular, there is an increasing need for communications to organizations outside of the traditional airline community. These organizations include computerized reservations systems, rental car companies, railroads, and customs agencies, among others. An important goal is to provide more and better services to all stakeholders, and cut costs at the same time.

There is therefore a strong motivation to migrate towards open systems. The industry is in the process of developing OSI protocol implementations, and is particularly interested in the adoption of Electronic Data Interchange for Administration, Commerce, and Transportation (EDIFACT) standards. Since much of the traffic generated by the airlines is in the form of individual messages, EDIFACT is crucial to the industry.

There are a number of advantages to moving towards OSI that are driving this development. First, it makes it more practical to buy hardware and software off the shelf, as opposed to developing systems especially for one company or for the industry. This is particularly important now, when the worldwide aviation industry is dealing with severe financial challenges. In addition to cutting costs, using off the shelf products can significantly reduce lead times, which is important in a competitive industry. It can also enable the use of diverse platforms, offload responsibility for upgrades and debugging to vendors, and reduce the legacy of self-developed software that is difficult to discard once it is in place.

The use of industry standard protocols will also ease access to non-airline organizations, increase functionality of software by increasing transparency of data, and provide a larger choice of vendors. It may even make it more feasible to make efficient use of public services such as electronic mail. However, these advantages do not come without cost. Not least is the financial invest-

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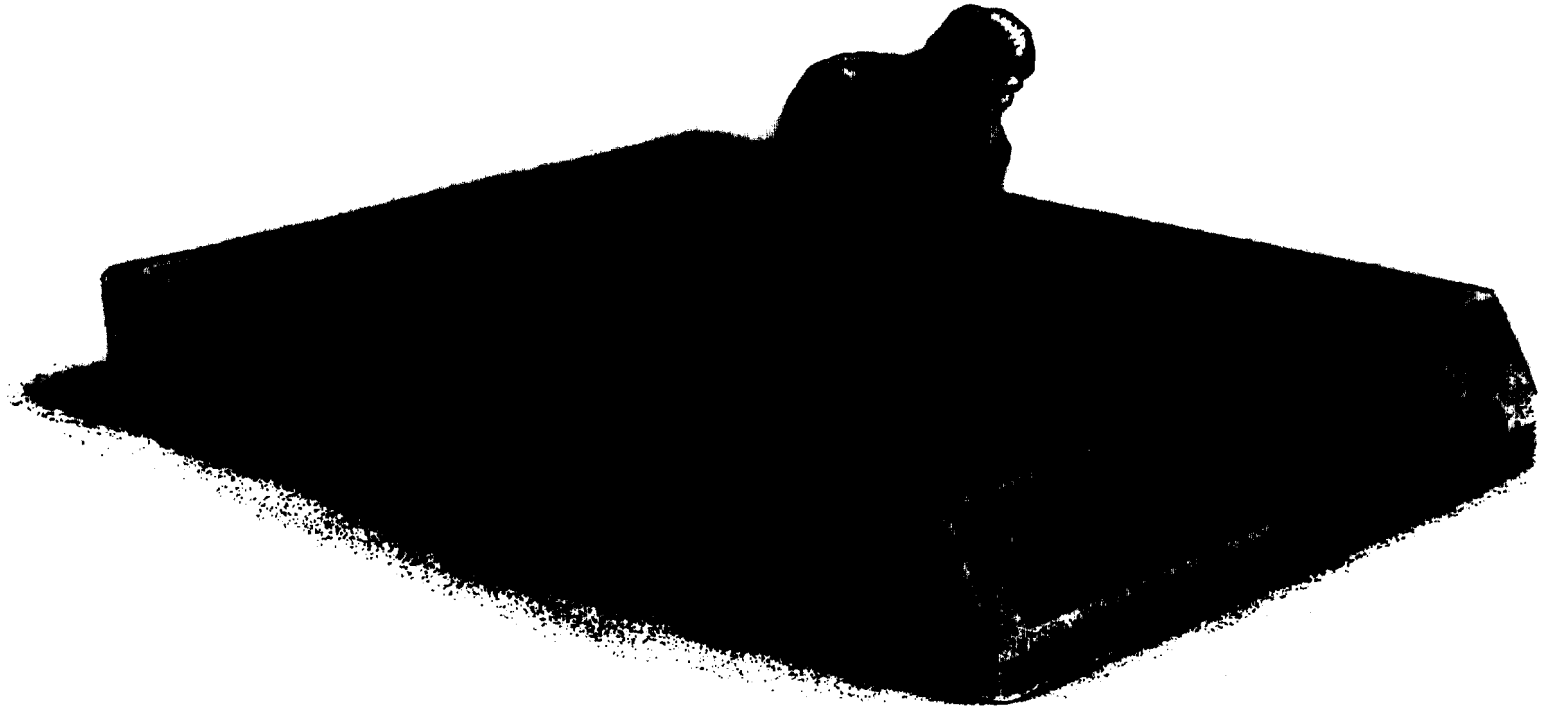

ment needed to develop and/or purchase new software and systems, at a time when many airlines have severe cash flow problems. There is also an investment in time to adopt new standards and learn how to use them advantageously. An additional danger lies in adopting standards that are not mature, or that must be modified for the use of the industry. A case in point is the use of AX.25, the airline version of the packet data network standard, which is not completely compatible with other implementations of this standard. There is a need to ensure compatibility with earlier standards, such as AX.25 and airline synchronous link control (SLC), since not all airlines will have the resources to migrate to open systems in the near future. Finally, knowledge and experience with OSI protocols is still limited within the air transport industry.

Nevertheless, the benefits of adopting OSI standards are seen to outweigh the disadvantages, and there is an ongoing effort to develop these standards. IATA-sponsored working groups, whose memberships are made up of representatives from airlines and IATA's Registered Suppliers and Travel Partners programs, are developing architectures and standards for OSI and EDIFACT implementations. These groups have produced several key documents that are being used as guidelines for the implementation of these protocols.

AERONAUTICAL OSI PROFILE

The cornerstone of this work is the aeronautical OSI profile (AOP), which sets a framework for the implementation of OSI protocols (**Figure 1**). As with GOSIP and UK-GOSIP, the AOP is a profile for development of OSI within a particular community. It provides guidance for air transport stakeholders who wish to implement these protocols. Referring to various CCITT and ISO documents as normative references, the AOP defines the particular implementation of OSI protocols within the air transport community. It identifies which standards are supported, as well as the particular options within these standards that are supported and permitted values within certain fields. An addressing plan at the network layer is also included.

The AOP is a living document, and is evolving as work is completed in various areas. The current version profiles the following protocols:

- CCITT X.25 and X.32, which describe interfaces to Packet Data Networks (PDNs), both public and private:
- ISO 8473, 8348 AD2, 9542, and 10589; these protocols describe the services, addressing, and routing protocols at the network layer;
- ISO 8073 and 8602, COTP and CLTP, describing connection-oriented and connectionless services at the transport layer;
- ISO 8327, COSP, the connection-oriented session layer protocol.
- ISO 8823, COPP, the connection-oriented presentation layer protocol.

A new version will profile a number of additional standards. As can be seen, the emphasis within the industry is on connection-oriented services, although

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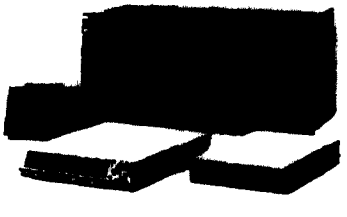

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connectionless services at the lower layers (transport and lower) are supported. The recommendation for connection-oriented services is driven by the need for reliable end-to-end services. Since much of the traffic generated in the air transport industry is financial in nature, reliability is crucial.

Although the application layer is not yet profiled in detail in the AOP, it is part of the document's framework. In particular, protocols such as the common management information service element (CMISE), the association control service element (ACSE), and the remote operation service element (ROSE) are described in the context of network management. ASN.1 (which resides in the presentation layer) is described in this context as well. application programming interfaces (APIs) and conformance testing are also treated in the AOP.

A new profile, the Architecture and Standard for IATA Interactive EDIFACT, will be published later this year. Although EDIFACT development is under the aegis of the United Nations, this document profiles the implementation of EDIFACT within the air transport community. An important feature of this profile is that it supports the use of interactive computing in a transaction processing environment. The objectives of this work are to:

- Provide a message transport mechanism between stakeholder application processes; these stakeholders are to include not only the airlines, but also other organizations that have a need to communicate with airlines;
- Support existing airline protocols (as well as OSI standard protocols). These include the airline Host-to-Host (HTH) protocol and SLC, which are described in other documents;
- Allow for migration to a longer term architecture which will eventually supersede this work, as OSI standards mature and implementation is more pervasive. The first EDIFACT architecture is designed as a migration path using the current suite of protocols.

The EDIFACT architecture (**Figure 2**) follows the OSI model and allows the support of airline-specific protocol implementations. The standard, based on normative CCITT and ISO standards (in particular ISO 9735), describes the data flows and interfaces for EDIFACT, as well as giving guidance on implementation.

The Architecture and Standard for IATA Interactive EDIFACT is part of a series of manuals that are collectively known as the Systems and Communications Reference. This series, which will encompass the ICM and other standards documents, is an evolving handbook on the implementation of IT standards within the air transport industry and its stakeholders.

THE FUTURE

The air transport industry, through IATA, continues to develop and update IT standards. This is a continuous process, as progress is made in standards development, and as the needs of airlines and other stakeholders evolve. In addition to the development of industry specific profiles and protocols, representatives from IATA and companies within the industry are active in the international standards process. Participation in standards efforts at the UN, ISO, and CCITT ensures that air transport industry needs will be addressed by these organizations, and that industry developed standards will be as compatible as possible with internationally developed standards.

Companies that wish to do business with the airlines are also stakeholders in the development of air transport standards. Their participation through the Registered Suppliers and Travel Partners programmes ensures that open systems development will progress in a manner that will maximize the usefulness of these standards once they are mature. This will result in the opening of the air transport community to more stakeholders in a truly open environment.

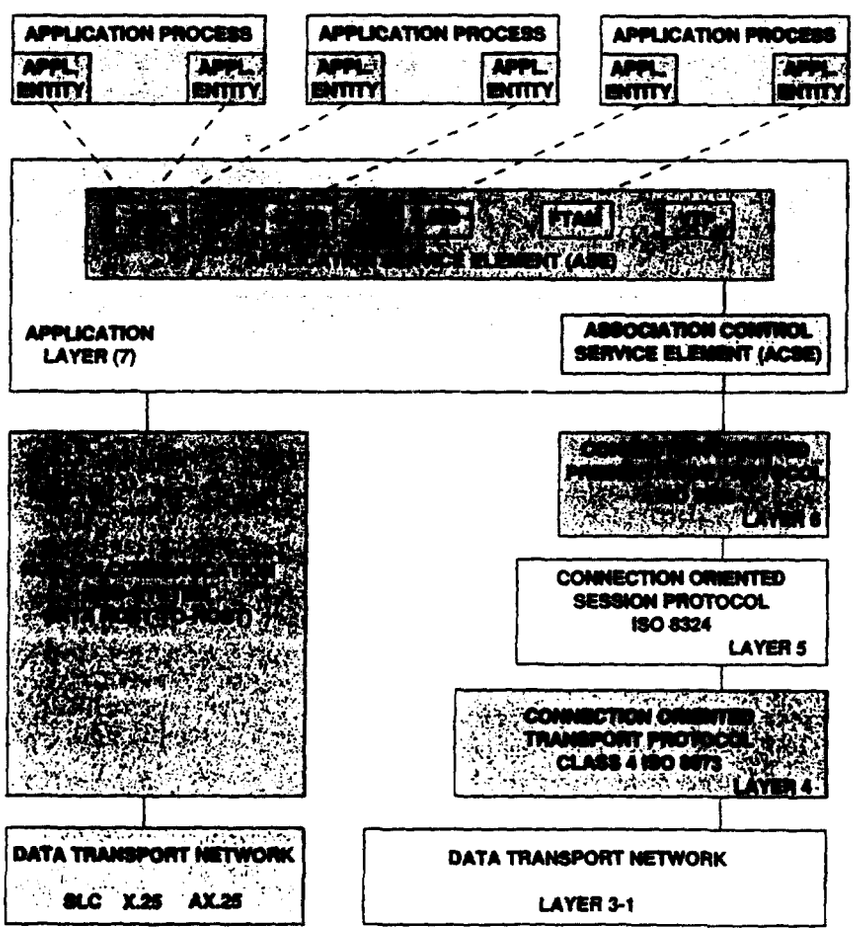

Fig. 2 IATA Interactive EDIFACT architecture

Henry Zalman *is manager of industry automation at the International Air Transport Association in Geneva. His background includes an M.S. in Telecommunications from the University of Colorado and more than a decade of experience in telecommunications systems engineering and consulting.*

Is this subject of interest to you?
Yes Circle 255 No Circle 256