ADDRESS DATA INTERCHANGE SPECIFICATION (ADIS)

GCA Standard 105-1986
Version 01-1

An Industry Standard
For Domestic and International
Address Management and Mail Production
Using Address Element Technology

ABOUT GCA

The Graphic Communications Association is a volunteer, non-profit technology management association for the print media and information technology industries. Its mission is the advancement of the processes of information interoperability and dissemination of knowledge. GCA accomplishes this mission in part by engaging in and supporting creation and adoption of globally recognized standards for information definition and exchange.

A PERSPECTIVE FROM THE GCA PRESIDENT:

The New ADIS

In 1967, when GCA formed what is now the Addressing/Distribution Committee, name and address accuracy was problematic. Computerization of files was just beginning, presorting – other than geographical file maintenance – was non-existent, and postal operations were totally manual. Name misspellings, address errors – as long as they were close – were okay, even city names could vary. Postal workers' neighborhood knowledge got most of the mail through, and low postal rates gave no incentive for greater accuracy.

By the mid-1980's, Postal Service automation, mail list computerization, presort discounts, merge/purge incentives, higher postage rates and more, made name and address accuracy essential. And that accuracy opened up a new world of opportunity for the advertising community called personalization. Inkjet capability in the bindery negated the need for voluminous and expensive paper labels, and coupled with new finishing capabilities made signature and insert selection and messaging, geared directly to the individual recipient, possible. With that, the industry needed a new link between the list facility and the bindery or mail finishing operation. Thus in 1986 was born ADIS, GCA's Address Data Interchange Specification. It provided a standard link for defining the nature and content of an address file and the personalization messages and instructions that went with it.

Since then, the cost of inaccuracy has gone up even further, and Postal administrations and mailers alike are working harder than ever to eliminate it. At the same time, personalization capabilities are further refined, to make parsing of address elements, down to the finest level, more valuable. On top of it all comes internationalization in the mailing business, as in most every other business. And that spells a need for greater coordination among the posts of the world.

Joe Lubenow of Experian, GCA's Addressing/Distribution Chair, saw all this happening, and knew that the major regions of the world needed to coordinate with one another in the creation of new standards for mail list management. He has brought together diverse interests in North America and elsewhere in the creation of a new draft ADIS Standard, and has built the necessary bridges through the Universal Postal Union to begin to realize the essential coordination with Europe and other areas of the world. It's an outstanding achievement.

GCA is proud to publish this address data interchange specification. And GCA is proud to thank Joe Lubenow for making it possible.

Norman W. Scharpf

INTRODUCTION

The development of an international standard for address management and mail production is a task requiring the energies and commitment of many people and organizations, and is more than can be accomplished by any single company or association.

In submitting this document for the review of the mailing industry and the postal services, we are humbled by the complexity of the task before us. At the same time we are confident that by working together with those around the world who are committed to the development of a new technology for postal address management and mail production, we can achieve our aims. This new approach is based on the scientific principle of analyzing any subject matter into the smallest components that are meaningful in order to gain understanding and control. It carries with it the corollary requirement that the parts of an address must be put back together to produce delivery addresses of high quality on a consistent and reliable basis. We hope that GCA ADIS will be a step toward a solution to both the analytic and synthetic goals.

This document is meant to make a contribution toward the objectives approved by the Standards Board of the Universal Postal Union in its two resolutions pertaining to the topic of international address standardization. Those resolutions are included as an appendix to this document.

Joe Lubenow
Vice President, Postal Affairs, Experian
Chair, GCA Addressing/Distribution Committee
Chair, GCA ADIS Project
April, 2001

ACKNOWLEDGMENTS

Three people are credited as Editors of this version of the GCA ADIS Specification. They are Mabel Grein of USPS, Phil Thompson of Quad/Graphics, and Noel Wickham from Experian. Each of them has worked hard on the development of ADIS, taken leadership of one or more aspects of the project, and made an individual impact on the overall architecture. Without their efforts, this version of ADIS could not have been developed.

Twelve more individuals are designated as Contributing Editors. Each of these persons has participated consistently in the process, making significant commitments of time and resources, and made contributions that have added value to the outcome.

Forty-three more people are listed as Distinguished Participants and Supporters. Each of them has taken action to help bring this version of ADIS into the light of day.

We are grateful for all of these efforts.

In addition, there are several people that deserve special recognition. Norman Scharpf, the only President GCA has ever had in its entire existence since 1967, has taken a personal role in advancing the development of international address standardization by joining the Direct Mail Advisory Board of the Universal Postal Union and participating as an observer in the UPU Standards Board. In addition, Norman has provided invaluable support for the project, focusing on increasing the internationalization of the address element definitions.

The first version of ADIS was published in 1986, and still survives today in limited use. It pioneered in defining address elements, establishing the scope of what an address standard should also incorporate in order to be useful for mail production, and in placing a data dictionary at its core. Truly it is remarkable that four participants in that earlier effort have also helped greatly to update it after fifteen years. Our gratitude to Peter Moore, Robert O'Brien, Mark Ryan, and James Schemmel is unbounded.

Finally, we would like to dedicate this document to an outstanding individual whose leadership in address management both in the United States Postal Service and the Universal Postal Union has been unsurpassed. Though Michael Murphy is retiring from the USPS very soon, we are sure that he is not retiring from his commitment to better address quality. He has been invaluable to the development of GCA ADIS, not only by building the USPS address management infrastructure to new heights, not just by leading the technical work of the UPU POST*Code group, but also by taking the time to directly participate in the ADIS process, inspiring all of us to believe that our work can help to make a difference.

GCA Address Data Interchange Specification (ADIS) Version 01-1

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Finally, we would like to mention some people and resources on which we relied on during the project, though they were not directly involved.

The GCA offers an opportunity through its conferences to meet and learn from world class experts. We had the chance to hear Charles Goldfarb, a founder of SGML, Jon Bosak of Sun Microsystems, an originator of XML, and James Clark, a leader in developing XSLT.

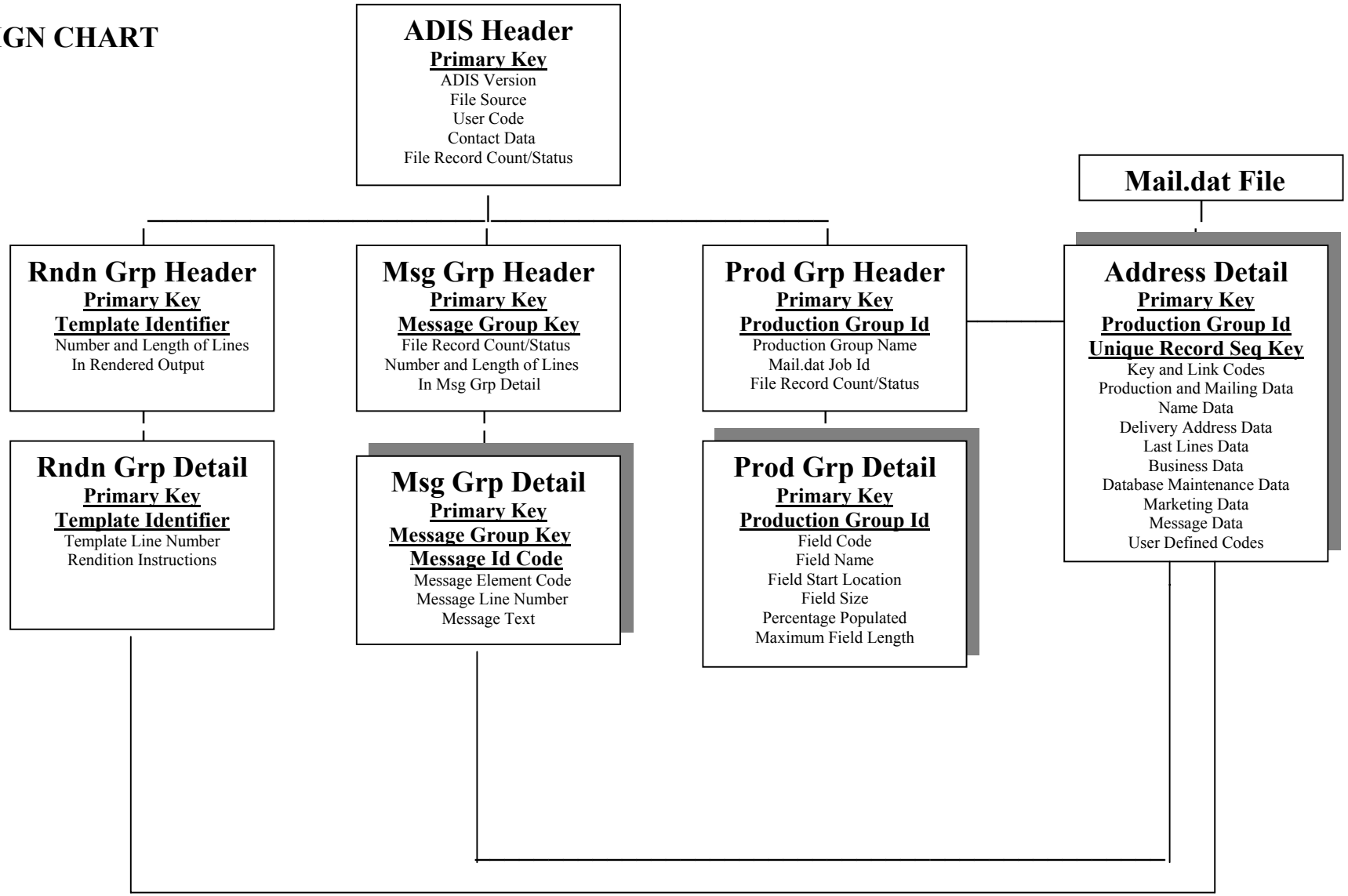
We learned about the CEN from a number of CEN addressing experts, including John Wells of International Post Corporation and Holger Wandt of Human Inference Enterprise B.V.

We were assisted by Jelto Stant, Guy Goudet, Ken McKeown, Raquel Ferrari and Alassane Guiro of the UPU staff in working with the UPU Standards Board and in forming the Address Management Project Team of the UPU Direct Mail Advisory Board. On the Address Management Project Team, Richard Mason of QAS Systems Ltd., Howard Krawitz of Davis Direct, and Charles Marlier of Readers Digest, among others, shared their knowledge.

Useful resources for international address management include the following:
Graham Rhind, Global Sourcebook for Address Data Management
Toby Atkinson, Merriam-Webster's Guide to International Business Communications
Marian Nelson, Guide to Worldwide Postal-Code and Address Formats
CD-ROM guides from the UPU POST*Code project

CONTENTS

ADIS DESIGN CHART



ADIS Header (.hdr)

ADIS Element Number	*Element Description*	*Positions Start*	*End*	*Lgt*	*Data Type*	*ADIS Mnemonic Code*	*CEN Code*	*ECCMA IAEC Code*	*Example*
A00.010	**Primary Key**	**1**	**10**	**10**	**A/N**				**Job Id etc i.e. 0005298731**
	GCA ADIS Version	**11**	**14**	**4**	**A/N**				**01-1**
	Originator Job Number	**15**	**24**	**10**	**A/N**				
	Originator Job Name	**25**	**54**	**30**	**A/N**				
	File Source	**55**	**84**	**30**	**A/N**				
	GCA User Code	**85**	**88**	**4**	**A/N**				**Can equate to Mail.dat user code**
	Contact Name	**89**	**118**	**30**	**A/N**				
	Contact Telephone	**119**	**138**	**20**	**A/N**				
	Production Group Header File Record Count	**139**	**147**	**9**	**N**				
	Production Group Header File Status	**148**	**148**	**1**	**A**				**O=original, N=no change, D=delete file, R=replace file, U=update individual records**
	Message Group Header File Record Count	**149**	**157**	**9**	**N**				
	Message Group Header File Status	**158**	**158**	**1**	**A**				**O=original, N=no change, D=delete file, R=replace file, U=update individual records**
	Rendition Group Header File Record Count	**159**	**167**	**9**	**N**				
	Rendition Group Header File Status	**168**	**168**	**1**	**A**				**O=original, N=no change, D=delete file, R=replace file, U=update individual records**
	Rendition Group Detail File Record Count	**169**	**177**	**9**	**N**				
	Rendition Group Detail File Status	**178**	**178**	**1**	**A**				**O=original, N=no change, D=delete file, R=replace file, U=update individual records**

One per file set

Production Group Header (.pgh)

ADIS Element Number	*Element Description*	*Positions Start*	*End*	*Lgt*	*Data Type*	*ADIS Mnemonic Code*	*CEN Code*	*ECCMA IAEC Code*	*Example*
A00.010	Primary Key	1	10	10	A/N	PRIMKEY			0005298731
A00.020	Production Group Id	11	13	3	A/N	PRODGRP			001
	Production Group Name	14	21	8	A/N				Domestic (identifies .pgd and .dtl)
	Mail.dat Job Id (*)	22	29	8	A/N				If appropriate
A10.900	LOT or Walk Sequence Forward/Reverse Direction for this File	30	30	1	A/N	LOTWSDR			F=forward, R=reverse, (Indicates the order in which the output is to be for the printer)
	Production Group Detail File Record Count	31	39	9	N				000000123
	Production Group Detail File Status	40	40	1	A				O=original, N=no change, D=delete file, R=replace file, U=update individual records
	Address Detail File Record Count	41	49	9	N				001234567
	Address Detail File Status	50	50	1	A				O=original, N=no change, D=delete file, R=replace file, U=update individual records

Repeat as necessary for each production group

Production Group Detail (.pgd)

ADIS Element Number	*Element Description*	*Positions Start*	*End*	*Lgt*	*Data Type*	*ADIS Mnemonic Code*	*CEN Code*	*ECCMA IAEC Code*	*Example(Note)*
A00.010	**Primary Key**	**1**	**10**	**10**	**A/N**	**PRIMKEY**			**0005298731**
A00.020	**Production Group Id**	**11**	**13**	**3**	**A/N**	**PRODGRP**			**001**
	ADIS/ECCMA Element Code	**14**	**20**	**7**	**A/N**				**ADIS Code or Mnemonic, ECCMA Code**
	ADIS Element Description	**21**	**50**	**30**	**A/N**				**e.g., Unique Sequence Number (optional)**
	Field Start Location	**51**	**54**	**4**	**N**				**0021 (position in record)**
	Field Size	**55**	**57**	**3**	**N**				**009 (the number of characters assigned)**
	% Field populated	**58**	**62**	**5**	**N**				**10000 (with decimal implied 100.00% of the detail records for this group have values in this field**
	Longest Data Value in Field	**63**	**65**	**3**	**N**				**031 (if populated - means no record contains more than 31 chars in this field. If not populated value is 000 or blank)**

Repeat as necessary for each address detail field used within the production group

Potential ADIS Database Record Content Detail (.dtl)

ADIS Element Number	*Mail .dat*	*Element Description*	*Max Lgt*	*Data Type*	*ADIS Mnemonic Code*	*CEN Code*	*ECCMA IAEC Code*	*Comments/Notes*
Key & Link Codes								
A00.010		Primary Key	10	A/N	PRIMKEY			Job Number, Account Number, etc
A00.020		Production Group Id	3	A/N	PRODGRP			Any number/code which identifies a prod grp
A00.030		Unique Sequence Number	12	N	UNIQSEQ			Unique sequence number of the record within the file (e. g. 9 digits primary, 3 digits secondary)
A00.040		Internal Customer Number	20	A/N	CUSTNUM		E13.003	Determined by user
A00.050		ISO Country Code (Alpha)	2	A/N	ISOCODE		E13.018	ISO two character alpha Country Code
A00.060		User Code	4	N	USERCOD		E13.008	Can equate to Mail.dat user license code
A00.070		Address Template Number	3	N	TMPNUM		E13.012	Primary rendition address template code
A00.080		Rendition Quality Indicator	1	A/N	RNDQUAL		E13.042	Y=Yes, N=No, or spaces
A00.080		Image/Graph Code	3	A/N	IMGCODE			Code for an external message or image
A00.090		Add/Delete Indicator	1	A	ADDELIN			A=add, D=delete (default = add)
Production and Mailing Information								
A10.010	*	Unique Pallet Number	9	A/N	UNIQPAL			For palletized mail, the unique pallet number that links to the mail.dat
A10.020	*	Display Pallet Number	9	A/N	DISPPAL			For palletized mail, the number of the pallet that appears on the pallet flag/hanger
A10.030	*	Pallet Destination Zip	5	N	PALDEST			5 Digit/3 Digit or appropriate DMM table zip
A10.040		Pallet Level (USPS)	4	A/N	PALVLUS			USPS abbrev: CR5, M5DS, 3DG, ADC, etc
A10.050	*	Pallet Level (Mail.dat)	2	A/N	PALVLMD			Mail.dat code: A, B, C, AB, AD, etc
A10.060	*	Unique Bag, Tray or Tub Number	9	A/N	UNIQBTT			For bag, tray or tub mail, the unique pallet number that links to the mail.dat
A10.070	*	Display Bag, Tray or Tub Number	9	A/N	DISPBTT			For bag, tray or tub mail, the display number of the bag/tray/tub in which the piece resides
A10.080	*	Bag, Tray or Tub Ind	1	N	BTTIND			1 = Bag, 2 = Tray, 3 = Tub
A10.090	*	Bag, Tray, or Tub Destination Zip	5	N	BTTDEST			5 Digit/3 Digit or appropriate DMM Table zip
A10.100		Bag/Tray/Tub Level (USPS)	4	A/N	BTLVLUS			USPS abbrev: CRD, 5DS, 3DG, ADC, etc
A10.110	*	Bag/Tray/Tub Level (Mail.dat)	2	A/N	BTLVLMD			Mail.dat code: A, B, C, AA, AB, AC, AD, etc
A10.120	*	Bundle/Package Number	9	N	BNDLNUM			The number of the package in which the piece resides
A10.130	*	Bundle/ Package Piece Number	9	N	BNDLPCE			The piece number within the package or bundle
A10.140	*	Bundle Destination Zip	5	N	BNDLDST			5 Digit/3 Digit or appropriate DMM Table zip
A10.150		Bundle/Package Level (USPS)	4	A/N	BNLVLUS			USPS abbrev: CR, 5DG, 3DG, ADC, etc
A10.160	*	Bundle/Package Level (Mail.dat)	2	A/N	BNLVLMD			Mail.dat code: A, B, C, D, E, etc
A10.170	*	Zip Code	5	N	ZIPCODE		E10.025	Postal Zip Code
A10.180		Z+4 Addendum	4	N	PLUS4		E10.026	The +4 portion of the US zipcode (digits 6-9)

A10.190		Zip Code Delivery Point Add-On	2	N	DPBCADD		E10.027	The delivery point portion of the US zipcode (digits 10 thru 11)
A10.200		Zip Display	13	A/N	ZIPDSPL			The zip/+4/DPBC formatted for output display.
A10.210		5 Digit Zip Check Digit	1	N	ZIP5CHK		E10.035	For 5 Digit zip only
A10.220		9 Digit (+4) Check digit	1	N	ZIP9CHK		E10.034	Check digit for 9 digit (+4) zipcode
A10.230		11 Digit (DPBC) Check Digit	1	N	DPBCCHK		E10.028	Check digit for 11 digit delivery point (DPBC)
A10.240		Postnet Barcode 2Bar Code (WXYZ Code)	31	A	PSTWXYZ			W=tall+tall, X=short+short, Y=tall+short, Z=short+tall
A10.250		PLANET Barcode (Numerics)	12	N	PLNCOD		E10.033	The 12 numeric characters that make up the contents of the Planet code (incl. check digit)
A10.280		PLANET Barcode 2Bar Code (WXYZ Code)	31	A	PLNWXYZ			W=tall+tall, X=short+short, Y=tall+short, Z=short+tall
A10.260		Carrier Route Code	4	A/N	CRRTCOD		E10.031	
A10.270	*	Line of Travel Number	6	N	LOTNUM		E10.032	LOT number (including derived digits)
A10.280	*	Line of Travel (LOT) Directional	1	A	LOTDIR		E13.020	Ascending (A), or Descending (D)
A10.290		Line of Travel Sort Key	6	N	LOTSORT			With last 2 digits complement where approp.
A10.300	*	Walk Sequence Number	4	N	WKSQNUM			For High Density & Saturation mail
A10.310		ACS Publication ID or Participant Code	7	A/N	ACSPUB		E13.029	Address Change Service client/customer identification code
A10.320		ACS Keyline	15	A/N	ACSKEY		E13.030	ACS Customer/Finder/Keyline code
A10.330		ACS Check Digit	1	N	ACSCHK		E13.031	USPS Modulus 10 Check Digit
A10.340		ACS Display	30	A/N	ACSDISP			ACS with keyline formatted & incl. # delimiters
A10.350		Customer/Finder Number/Keyline	20	A/N	KEYLINE		E13.001 E13.002 E13.011	Link to client/mailer house file or database
A10.360	*	Segment ID Code	4	A/N	SEGID			Segment Id from Mail.dat
A10.370	*	MPU ID Code	5	A/N	MPUID			Mail Piece Unit Id from Mail.dat
A10.380	*	Edition/Version Code	6	A/N	EDITNCD			Edition or version code for book manufacturing
A10.390	*	Demographic or Selective Binding Code	6	A/N	DEMOCD			Demographic binding code to differentiate book makeup within edition or version
A10.400		Promo/Effort/Mkting or Offer Code	10	A/N	PROMOKY		E13.004	A code to facilitate backend sales analysis
A10.410		Bundle/Pkg Begin/End	1	A/N	PKGMARK			B=beginning of Package, E=end of Package
A10.420		Bag/Tray/Tub Begin/End	1	A/N	BAGMARK			B=beginning of Sack, Tray, or Tub E=end of Sack, Tray, or Tub
A10.430		Pallet Begin/End	1	A/N	PALMARK			B=beginning of Pallet, E=end of Pallet
A10.440	*	Entry Point Zip	5	N	EPZIP			
A10.450	*	Entry Point Type	3	A	EPTYPE			DDU, 5DG, SCF, BMC, HUB, ADC, etc
A10.460		Entry Point Load Begin/End	1	A	EPNTBGN EPNTEND			B=beginning of Load, E=end of Load
A10.470		DDU Label Zipcode	5	N	DDUZIP			DDU/Scheme in which this record resides
A10.480		SCF Label Zipcode	5	N	SCFZIP			SCF in which this record resides
A10.490		ADC Label Zipcode	5	N	ADCZIP			ADC in which this record resides

A10.500		ASF Label Zipcode	5	N	ASFZIP			ASF in which this record resides
A10.510		BMC Label Zipcode	5	N	BMCZIP			BMC in which this record resides
A10.520		MXD ADC Label Zipcode	5	N	MADCZIP			Mixed ADC label to be used if in a working container
A10.530		Zone	1	A/N	ZONE			D, S, B , 1-8, etc
A10.540		Optional Endorsement	30	A/N	OEL			Example: ********** ECRLOT C001
A10.550		Postcode (External)	13	A/N	POSTCD	C.4.3.21	E10.030	Postal code for international mailings
A10.560		Delivery Mode Code	6	A/N	DLMCODE			Canadian
A10.570		Delivery Freshness Code	1	A/N	DLFCODE			Canadian – Freshness audit code
A10.580		Delivery Database Start	8	N	DLSTART			yyyymmdd - Canadian - Database start date
A10.590		Delivery Database End	8	N	DLEND			yyyymmdd - Canadian – Database end date
Name Information (Addressee)								
A20.010		Primary Full Name	60	A	PFULNME			Primary addressee
A20.020		Primary Name Pre-salutation/Honorific	10	A	PPREHON	C.4.3.13	E11.002	Mr, Mrs, Ms, Miss, Dr, Rev, Hon, etc of the primary individual
A20.030		Primary First Name	20	A	PCHSNME		E11.003	First name of primary addressee
A20.040		Primary Preferred Name	20	A	PNCKNME		E11.010	Nickname or other preferred name
A20.050		Primary Middle Name	20	A	PMD1NME		E11.004	Name following first name
A20.060		Primary 2nd Middle Name	20	A	PMD2NME		E11.005	Name following middle name
A20.070		Primary Last Name Prefix	20	A	PLSTNMP	C.4.3.28		Isolation of 'von', 'van', etc as appropriate
A20.080		Primary Last Name	20	A	PLSTNME	C.4.3.29	E11.006	Last name of primary addressee
A20.090		Primary Name Post Honorific	20	A	PPSTHON	C.4.3.23	E11.007	PHD, MBA, MM, BCOM, DDS, etc
A20.100		Primary Name Suffix or Generation	10	A	PSUFNME	C.4.3.18	E11.008	Jr, Sr, III, etc
A20.110		Compound Name Indicator	1	A	COMPNME			Y = yes if both names populated
A20.120		Second Full Name	60	A	SFULNME			Second addressee
A20.130		Second Name Pre-salutation/Honorific	10	A	SPREHON		E11.012	Mr, Mrs, Ms, Miss, Dr, Rev, Hon, etc of the secondary individual
A20.140		Second First Name	20	A	SCHSNME		E11.013	First name of second addressee
A20.150		Second Preferred Name	20	A	SNCKNME			Nickname or other preferred name
A20.160		Second Middle Name	20	A	SMD1NME		E11.014	Name following first name
A20.170		Second 2nd Middle Name	20	A	SMD2NME		E11.015	Name following middle name
A20.180		Second Last Name Prefix	20	A	PLSTNMP			Isolation of 'von', 'van', etc as appropriate
A20.190		Second Last Name	20	A	SLSTNME		E11.016	Last name of second addressee
A20.200		Second Name Post Honorific	20	A	SPSTHON		E11.017	PHD, MBA, MM, BCOM, DDS, etc
A20.210		Second Name Suffix or Generation	10	A	SSUFNME		E11.018	Jr, Sr, III, etc
A20.220		Alternate Postal Recipient	60	A	ALTPREC			or current resident, or current occupant, postal customer, etc
A20.230		Mailee	60	A	MAILEE		Pending	Such as C/O JOHN DOE OR C/- JOHN DOE
Delivery Address Information (Addressee)								
A30.010		Primary Full Street Name	60	A	PFULST			
A30.020		Primary St House/Plot Number	10	A/N	PHSENUM	C.4.3.25	E10.002	Location number of house/plot/etc on street

A30.030		Primary Street Pre-directional	10	A/N	PSTPRED	C.4.3.32	Pending	Directional before street name
A30.040		Primary Pre-Street Type	10	A/N	PSTPRET			Avenue, Calle, etc
A30.050		Primary Street Name	28	A/N	PSTNME	C.4.3.31	E10.009	Actual primary street name
A30.060		Primary Street Type	10	A/N	PSTTYPE	C.4.3.33	E10.010	Ave, Rd, Lane, Blvd, etc
A30.070		Primary Street Post-Directional	10	A/N	PSTPOSD		E10.011	Directional following street name
A30.080		Primary Line Secondary Designator # 1	10	A/N	PLSECD1		E10.012	Secondary address Designator # 1 type
A30.090		Primary Line Secondary Designator # 1 Value	10	A/N	PLSECV1		E10.013	Secondary address Designator # 1 number
A30.100		Primary Line Secondary Designator # 2	10	A/N	PLSECD2			Secondary address Designator # 2 type
A30.110		Primary Line Secondary Designator # 2 Value	10	A/N	PLSECV2			Secondary address Designator # 2 number
A30.120		Primary Line Secondary Designator # 3	10	A/N	PLSECD3			Secondary address Designator # 3 type
A30.130		Primary Line Secondary Designator # 3 Value	10	A/N	PLSECV3			Secondary address Designator # 3 number
A30.140		Primary Line Secondary Designator # 4	10	A/N	PLSECD4			Secondary address Designator # 4 type
A30.150		Primary Line Secondary Designator # 4 Value	10	A/N	PLSECV4			Secondary address Designator # 4 number
A30.160		Post Office Box Number	10	A/N	POBOXN		E10.015	PO Box Number (needs PO Box in address)
A30.170		Route Type	2	A/N	ROUTYPE			Rural Route Type - HC, RR, etc
A30.180		Route Number	10	A/N	ROUTNUM		E10.016	Rural Route Number
A30.190		Second Full Street Name	60	A	SFULST			M = multi, S = single, U = unknown
A30.200		Second St House/Plot Number	10	A/N	SHSENUM			Location number of house/plot/etc on street
A30.210		Second Street Pre- directional	10	A/N	SSTPRED			
A30.220		Second Pre-Street Type	10	A/N	SSTPRET			Avenue, Calle, etc
A30.230		Second Street Name	28	A/N	SSTNME			
A30.240		Second Street Type	10	A/N	SSTTYPE			
A30.250		Second Street Post-Directional	10	A/N	SSTPOSD			
A30.260		Second Line Secondary Designator # 1	10	A/N	SLSECD1			2nd line secondary address # 1 type
A30.270		Second Line Secondary Designator # 1 Number	10	A/N	SLSECV1			2nd line secondary address # 1 number
A30.280		Second Line Secondary Designator # 2	10	A/N	SLSECD2			2nd line secondary address # 2 type
A30.290		Second Line Secondary Designator # 2 Number	10	A/N	SLSECV2			2nd line secondary address # 2 number
A30.300		Second Line Secondary Designator # 3	10	A/N	SLSECD3			2nd line secondary address # 3 type
A30.310		Second Line Secondary Designator # 3 Number	10	A/N	SLSECV3			2nd line secondary address # 3 number
A30.320		Second Line Secondary Designator # 4	10	A/N	SLSECD4			2nd line secondary address # 4 type
A30.330		Second Line Secondary Designator # 4 Number	10	A/N	SLSECV4			2nd line secondary address # 4 number

A30.340		Supplementary Delivery Data	40	A/N	SUPPDLV	C.4.3.26	Pending	Such as: 'Leave on back porch'
Last Lines Information								
A40.010		Dependent Locality/Proximate Town	28	A/N	DEPLOC	C.4.3.22	Pending	Major town or location close by – needed for delivery
A40.020		Locality/Urbanization/District Name	28	A/N	URBLOC	C.4.3.9	E10.014 E10.029	Such as in Puerto Rico, or neighborhood name
A40.030		Full City/State/Zip	60	A/N	FULLCSZ			
A40.040		City/Town Name	28	A/N	CITYNAM	C.4.3.34	E10.018	Name of the city
A40.050		State/Province/Region Name	28	A/N	STATPRV	C.4.3.24	E10.019 E10.021 E10.022	Name of the state, province, or territory
A40.060		State/Province/Region Abbreviation	3	A/N	STPRVAB		E10.020	Official abbreviation of State, Province, or Territory
A40.070		Country Name (Sending)	40	A/N	CTRYSND			e.g.: Ireland, Holland, Switzerland, etc
A40.080		Country Name (Receiving)	40	A/N	CTRYREC	C4.3.4	E10.024	e.g.: Eire, Netherlands, Suisse, etc
Business Information								
A50.010		Title	60	A	TITLE	C.4.3.14	E11.011	Title of primary addressee
A50.020		Firm/Corporation/Name	60	A	FIRMNAM			Company or Firm with which primary addressee is affiliated
A50.030		Organization Name	60	A	ORGNAME	C.4.3.19	E11.001	Organization with which primary addressee is affiliated
A50.040		Organization Type	20	A	ORGTYPE	C.4.3.16	Pending	Such as Pty, Inc, Ltd, Partnersship, etc
A50.050		Department Name	60	A	DPTNAME		E10.006	Department of primary addressee
A50.060		Division Name	60	A	DIVNAME		E10.007	Division of primary addressee
A50.070		Building Name	60	A	BLDGNAM	C.4.3.2	E10.005	Name of building of primary addressee
A50.080		Building Type	60	A	BLDGTYP	C.4.3.3	Pending	Type of building of primary addressee
A50.090		Mail Stop	60	A	MAILSTP		E10.008	Mail stop within the building or facility
Data Base Maintenance Information								
A60.010		Zip Coding Source	5	A	ZIPSRC		E13.028	DSF, AEC, GRP, PTB, PSF, etc
A60.020		Zip Coding Date	8	N	ZIPDATE		E13.026	yyyymmdd (date coded)
A60.030		Zip Coding Database Date	8	N	ZIPDBD		E13.027	yyyymmdd (date of USPS database/file)
A60.040		Carrier Route Source	5	A	CRTSC		E13.021	DSF, AEC, GRP, PTB, PSF, etc
A60.050		Carrier Route Code Date	8	N	CRTDATE		E13.022	yyyymmdd (date coded)
A60.060		Carrier Route Code Database Date	8	N	CRTDBD		E13.023	yyyymmdd (date of USPS database/file)
A60.070		Walk Sequence Number Source	5	A	WSNSRC			DSF, CDS, etc
A60.080		Walk Sequence Date	8	N	WSNDATE			yyyymmdd (date coded)
A60.090		Walk Sequence Database Date	8	N	WSNDBD			yyyymmdd (date of USPS database/file)
A60.100		Line of Travel Source	5	A	LOTSRC		E13.024	DSF, GRP, PTB, PSF, etc
A60.110		Line of Travel Date	8	N	LOTDATE			yyyymmdd (date coded)
A60.120		Line of Travel Database Date	8	N	LOTDBD		E13.025	yyyymmdd (date of USPS database/file)
Marketing Data - General								

A70.010		Missing Secondary Address Indicator	1	A	MISECAI		E13.039	C=address complete, M=address info missing, U=unknown
A70.020		Missing Secondary Address Source	5	A	MISECAS		E13.040	From DSF, etc
A70.030		SFDU/MFDU Indicator	1	A	FDUINDC			S = single, M= multi
A70.040		SFDU/MFDU Source	5	A	FDUSRCE			From DSF, etc
A70.050		Seasonal Indicator	1	A	SEASIND		E13.043	
A70.060		Seasonal Source	5	A	SEASSRC		E13.044	From DSF, etc
A70.070		Vacancy Indicator	1	A	VACINDC		E13.046	Y = yes
A70.080		Vacancy Source	5	A	VACSRCE		E13.047	From DSF, etc
A70.090		List Code	10	A	LISTCOD		E13.052	Marketing list identification code
A70.100		Primary Name Gender	1	A	PNAMGDR		E11.009	F=female, M=male, U=unknown
A70.110		Second Name Gender	1	A	SNAMGDR		E11.019	F=female, M=male, U=unknown
A70.120		Last NCOA date	8	N	NCOADAT		E13.033	yyyymmdd (date of NCOA processing)
A70.130		Address Complete Ind	1	A	ADDRCMP		E13.037	C=complete & correct, I=Incomplete, U=unknown
A70.140		Address Complete Source	5	A	ADDRCSR		E13.038	From DSF, NCOA, etc
A70.150		ZIP Change	1	A	ZIPCHG			Y=yes
A70.160		ZIP Change Date	8	N	ZIPCHGD		E13.049	yyyymmdd
A70.170		Previous ZIP code	5	N	ZIPPREV		E13.050	
A70.180		Latitude Degrees	12	N	LATDEG		E10.037	Format 999V9(9) (implied decimal place)
A70.190		Latitude Directional	1	A	LATDIR		E10.038	N=north, S=south
A70.200		Latitude Alternate	6	N	LATALT			HHMMSS (24 hr format)
A70.210		Longitude Degrees	12	N	LONGDEG		E10.039	Format 999V9(9) (implied decimal place)
A70.220		Longitude Directional	1	A	LONGDIR		E10.040	E=east, W=west
A70.230		County /Parish Name	60	A	CNTPRNM		E10.017 E10.023	
A70.240		County FIPS	5	A	CNFIPS		E13.036	Federal Information Processing Standard County Code
A70.250		Telephone Number	20	N	TELNUM		E12.014	
A70.260		Electronic Mail Address	60	A/N	EMAIL		E12.004	email address
A70.270		Congressional Code	10	A/N	CNGRSCD		E13.017	Congressional district code
A70.280		Zipcode Delivery Point Type	2	A/N	DLPTTYP			B, CR, GD, HC, RR
A70.290		Dual Address Preference Indicator	2	A	DUALADD		E13.032	BO=Box Only, SO= Street Only BP=Box primary, SP=Street Primary
A70.300		Uncategorized Data	60	A/N	UNCAT			Uncategorized or unknown input data
Marketing Data – Specific Secondary Designators								
A80.010		Private Box Number (excluding PMB)	10	A/N	PRBOXN		E10.036	Box # for Rural Route, Military, etc. Need the word 'BOX' in the address. Use '-' if no specific value
A80.020		Private Mail Box (PMB) Number	10	A/N	PMBBOXN		E10.001	Box # for Private Mail Box (PMB). Should have 'PMB' in the address. Use '-' if no specific value
A80.030		Unresolved # Sign Number	10	A/N	PNDSGN			Number applicable to a # sign in address. Use '-' if no specific value
A80.040		Annex	20	A/N	ANNEX			'-' if no specific value
A80.050		Apartment	20	A/N	APTNUMB			'-' if no specific value
A80.060		Basement	20	A/N	BASEMNT			'-' if no specific value

A80.070		**Building**	**20**	**A/N**	**BUILDNG**			**'-' if no specific value**
A80.080		**Department**	**20**	**A/N**	**DPRTMNT**			**'-' if no specific value**
A80.090		**Door**	**20**	**A/N**	**DOOR**	**C.4.3.10**		**'-' if no specific value**
A80.100		**Floor**	**20**	**A/N**	**FLOOR**	**C.4.3.12**	**Pending**	**'-' if no specific value**
A80.110		**Front**	**20**	**A/N**	**FRONT**			**'-' if no specific value**
A80.120		**Hanger**	**20**	**A/N**	**HANGER**			**'-' if no specific value**
A80.130		**Key**	**20**	**A/N**	**KEY**			**'-' if no specific value**
A80.140		**Lobby**	**20**	**A/N**	**LOBBY**			**'-' if no specific value**
A80.150		**Lot**	**20**	**A/N**	**LOT**			**'-' if no specific value**
A80.160		**Lower**	**20**	**A/N**	**LOWER**			**'-' if no specific value**
A80.170		**Office**	**20**	**A/N**	**OFFICE**			**'-' if no specific value**
A80.180		**Penthouse**	**20**	**A/N**	**PTHOUSE**			**'-' if no specific value**
A80.190		**Pier**	**20**	**A/N**	**PIER**			**'-' if no specific value**
A80.200		**Rear**	**20**	**A/N**	**REAR**			**'-' if no specific value**
A80.210		**Room**	**20**	**A/N**	**ROOM**			**'-' if no specific value**
A80.220		**Side**	**20**	**A/N**	**SIDE**			**'-' if no specific value**
A80.230		**Slip**	**20**	**A/N**	**SLIP**			**'-' if no specific value**
A80.240		**Space**	**20**	**A/N**	**SPACE**			**'-' if no specific value**
A80.250		**Stop**	**20**	**A/N**	**STOP**			**'-' if no specific value**
A80.260		**Suite**	**20**	**A/N**	**SUITE**			**'-' if no specific value**
A80.270		**Trailer**	**20**	**A/N**	**TRAILER**			**'-' if no specific value**
A80.280		**Unit**	**20**	**A/N**	**UNIT**			**'-' if no specific value**
A80.290		**Unknown**	**20**	**A/N**	**UNKNOWN**			**If no specific value, put in uncategorized data**
A80.300		**Upper**	**20**	**A/N**	**UPPER**			**'-' if no specific value**
A80.310		**Wing**	**20**	**A/N**	**WING**	**C.4.3.35**	**Pending**	**'-' if no specific value**
Message Information (where nnn equals the message number and up to 999 entries may occur)								
MLC.nnn		**Location of Message**	**3**	**N**	**MLCnnn**			**A code indicating the location on the book for message 'nnn' – such as station number**
MTM.nnn		**Message Template Number**	**3**	**N**	**MSGnnn**			**The template number to be used for message 'nnn'**
MGR.nnn		**Message Group Key**	**8**	**A/N**	**MGRnnn**			**Message group containing the message 'nnn'**
User defined Codes								
Unn.nnn		**User Defined Code**	*******	**A/N**	**Unnnnn**			**User defines element code, name, length, and contents**

One per address record within production group

Message Group Header (.mgh)

ADIS Element Number	*Element Description*	*Positions Start*	*End*	*Lgt*	*Data Type*	*ADIS Mnemonic Code*	*CEN Code*	*ECCMA IAEC Code*	*Example(Note)*
A00.010	**Primary Key**	**1**	**10**	**10**	**A/N**	**PRIMKEY**			**0005298731**
	Message Group Key	**11**	**18**	**8**	**A/N**				**MsgGrp01 (identifies .mgd)**
	Number of Lines	**19**	**21**	**3**	**N**				**001 (allows validation of .mgd)**
	Length of Lines	**22**	**24**	**3**	**N**				**Determines length of .mgd**
	Message Group Detail Record Count	**25**	**33**	**9**	**N**				**000000046**
	Message Group Detail Record Status	**34**	**34**	**1**	**A**				**O=original, N=no change, D=delete file, R=replace file, U=update individual records**

One per message group key

Message Group Detail (.mgd)

ADIS Element Number	*Element Description*	*Positions Start*	*End*	*Lgt*	*Data Type*	*ADIS Mnemonic Code*	*CEN Code*	*ECCMA IAEC Code*	*Example(Note)*
A00.010	**Primary Key**	**1**	**10**	**10**	**A/N**				**0005298731**
	Message Group Key	**11**	**18**	**8**	**A/N**				**Identifies message group**
A00.060	**ISO Country Code (Alpha)**	**19**	**20**	**2**	**A/N**	**ISOCODE**		**E13.018**	**ISO Two Character Alpha Country Code**
	Message Id Code	**21**	**23**	**3**	**N**				**001 (the 'nnn' part of MTMnnn on .dtl is the message code)**
	Message Line Number	**24**	**26**	**3**	**N**				**001**
	Message Element Code	**27**	**33**	**7**	**A/N**				**M01.002 (1st element in message 2)**
	Message Text	**34**	***	***	**A/N**				**Length specified by .mgh**

Repeat as necessary for each message element on each line of each message within each country in the message group

Rendition Group Header (.rgh)

ADIS Element Number	*Element Description*	*Positions Start*	*End*	*Lgt*	*Data Type*	*ADIS Mnemonic Code*	*CEN Code*	*ECCMA IAEC Code*	*Example (Note)*
A00.010	**Primary Key**	**1**	**10**	**10**	**A/N**				**0005298731**
	Template Identifier	**11**	**22**	**12**	**A/N**				**(ISO country code+User code+Template type+Template number combined)**
	Rendition Quality Threshold	**23**	**24**	**2**	**N**				**The maximum command priority that can be used without compromising delivery**
	Maximum Output Data Output Lines Available	**25**	**27**	**3**	**N**				**008**
	Maximum Characters Available per Output Line	**28**	**30**	**3**	**N**				**040**

Repeat as necessary for each template

Rendition Group Detail (.rgd)

ADIS Element Number	*Element Description*	*Positions Start*	*End*	*Lgt*	*Data Type*	*ADIS Mnemonic Code*	*CEN Code*	*ECCMA IAEC Code*	*Example(Note)*
A00.010	**Primary Key**	**1**	**10**	**10**	**A/N**				**0005298731**
	Template Identifier	**11**	**22**	**12**	**A/N**				**(ISO country code+User code+Template type+Template number combined)**
	Template Line Number	**23**	**25**	**3**	**N**				**001**
	Line Priority	**26**	**28**	**3**	**N**				**002 (2nd most valuable set of line data)**
	Line Merge	**29**	**29**	**1**	**N**				**1 (merge with other line flagged as 1)**
	Line Merge Order	**30**	**30**	**1**	**N**				**1 (this line data 1st on merged line)**
	Line Merge Location	**31**	**33**	**3**	**N**				**001 (line location for merged line) data**
	Line Segment	**34**	**34**	**1**	**N**				**2 (this data is part of segment 2 of line)**
	Line Compress	**35**	**37**	**3**	**N**				**005 (compress up to line 5 if empty lines)**
	Line Command	**38**	**44**	**7**	**A/N**				**ABBREV, ELIM, INIT, REDUCE, etc**
	ADIS Element Key (1st)	**45**	**51**	**7**	**A/N**				**(see .dtl or mgd file for ADIS element keys)**
	ADIS Element Key (2nd)	**52**	**58**	**7**	**A/N**				**(see .dtl or mgd file for ADIS element keys)**
	Left/Right Justify	**59**	**59**	**1**	**A**				**L=left, R=right**
	Starting Position on Line	**60**	**62**	**3**	**N**				**035 (start in position 35 of line 001)**
	Length of Character String	**63**	**65**	**3**	**N**				**018 (string starts in pos 35, ends in pos 52)**
	Line Command Priority	**66**	**67**	**2**	**N**				**01—determines order of execution**
	Literal Insert/Content	**68**	**97**	**30**	**A/N**				**'OR CURRENT RESIDENT '**

Repeat as necessary for each line of rendition instructions within each template

ADIS/XML VERSION 01-1 DOCUMENT TYPE DEFINITION (DTD)

```
<?xml version="1.0" encoding="UTF-8"?>
<!--  -->
<!-- This DTD supports header, production group header, address detail -->
<!-- ADIS and ECCMA element codes are shown as examples to
    demonstrate how they can be represented as XML attributes -->
<!--  -->
<!ELEMENT adis.xml (header, (group.header, detail)+)>
<!--  -->
<!ELEMENT header (primary.key, version, job.num, job.name, source, user.code, contact.name, contact.phone)>
<!ELEMENT primary.key (#PCDATA)>
<!ATTLIST primary.key
     code CDATA #FIXED "A00.010"
>
<!ELEMENT version (#PCDATA)>
<!ELEMENT job.num (#PCDATA)>
<!ELEMENT job.name (#PCDATA)>
<!ELEMENT source (#PCDATA)>
<!ELEMENT user.code (#PCDATA)>
<!ELEMENT contact.name (#PCDATA)>
<!ELEMENT contact.phone (#PCDATA)>
<!--   -->
<!ELEMENT group.header (group.id, group.name, job.id.dat?, lot.ws.ord?)>
<!ELEMENT group.id (#PCDATA)>
<!ELEMENT group.name (#PCDATA)>
<!ELEMENT job.id.dat (#PCDATA)>
<!ELEMENT lot.ws.ord (#PCDATA)>
<!--   -->
<!ELEMENT detail (keys, address, mailing.data?)+>
<!ELEMENT keys (sequence.num, customer.num?, template, rendition.quality.indicator?, image.code?,
add.delete?)>
<!ELEMENT sequence.num (#PCDATA)>
<!ELEMENT customer.num (#PCDATA)>
<!ELEMENT template (iso.country.code, template.num?)>
<!ELEMENT iso.country.code (#PCDATA)>
<!ELEMENT template.num (#PCDATA)>
<!ELEMENT rendition.quality.indicator (#PCDATA)>
<!ELEMENT image.code (#PCDATA)>
<!ELEMENT add.delete (#PCDATA)>
<!--   -->
<!ELEMENT address (name+, mailee?, business.data?, alternate.recipient?, street+, last.line.data)>
<!ELEMENT name (unparsedname+ | parsedname+)>
<!ELEMENT unparsedname (#PCDATA)>
<!ELEMENT parsedname (pre.honorific?, first, middle?, second.middle?, last.prefix?, last, post.honorific?, suffix?)>
<!ELEMENT pre.honorific (#PCDATA)>
<!ATTLIST pre.honorific
     code (E11.002 | E11.012) #IMPLIED
     rule CDATA #FIXED "ELIM"
>
<!ELEMENT first (#PCDATA)>
<!ATTLIST first
     code (A20.030 | A20.140) #IMPLIED
     preferred CDATA #IMPLIED
>
<!ELEMENT middle (#PCDATA)>
<!ATTLIST middle
     code (A20.050 | A20.160) #IMPLIED
     rule CDATA #FIXED "INIT"
>
<!ELEMENT second.middle (#PCDATA)>
<!ELEMENT last.prefix (#PCDATA)>
<!ELEMENT last (#PCDATA)>
<!ELEMENT post.honorific (#PCDATA)>
<!ATTLIST post.honorific
     code (A20.090 | A20.200) #IMPLIED
     rule CDATA #FIXED "ELIM"
```

```
>
<!ELEMENT suffix (#PCDATA)>
<!--  -->
<!ELEMENT mailee (#PCDATA)>
<!--  -->
<!ELEMENT business.data (title?, firm.name?, org.name?, dept?, div?, building.name?, mail.stop?)>
<!ELEMENT title (#PCDATA)>
<!ELEMENT firm.name (#PCDATA)>
<!ELEMENT org.name (#PCDATA)>
<!ELEMENT dept (#PCDATA)>
<!ELEMENT div (#PCDATA)>
<!ELEMENT building.name (#PCDATA)>
<!ELEMENT mail.stop (#PCDATA)>
<!--   -->
<!ELEMENT alternate.recipient (#PCDATA)>
<!--   -->
<!ELEMENT street (unparsedstreet+ | parsedstreet+)>
<!ELEMENT unparsedstreet (#PCDATA)>
<!ELEMENT parsedstreet (primary.num?, pre.dir?, pre.type?, street.name?, post.type?, post.dir?, sec1.type?,
sec1.num?, sec2.type?, sec2.num?, sec3.type?, sec3.num?, sec4.type?, sec4.num?)>
<!ELEMENT primary.num (#PCDATA)>
<!ELEMENT pre.dir (#PCDATA)>
<!ELEMENT pre.type (#PCDATA)>
<!ATTLIST pre.type
     rule CDATA #FIXED "ABBREV"
>
<!ELEMENT street.name (#PCDATA)>
<!ATTLIST street.name
     rule CDATA #FIXED "REDUCE"
>
<!ELEMENT post.type (#PCDATA)>
<!ATTLIST post.type
     rule CDATA #FIXED "ABBREV"
>
<!ELEMENT post.dir (#PCDATA)>
<!ELEMENT sec1.type (#PCDATA)>
<!ELEMENT sec1.num (#PCDATA)>
<!ELEMENT sec2.type (#PCDATA)>
<!ELEMENT sec2.num (#PCDATA)>
<!ELEMENT sec3.type (#PCDATA)>
<!ELEMENT sec3.num (#PCDATA)>
<!ELEMENT sec4.type (#PCDATA)>
<!ELEMENT sec4.num (#PCDATA)>
<!--  -->
<!ELEMENT last.line.data (dependent.locality?, locality?, (unparsed.last.line | parsed.last.line),
receiving.country.name?, sending.country.name?)>
<!ELEMENT dependent.locality (#PCDATA)>
<!ELEMENT locality (#PCDATA)>
<!ELEMENT unparsed.last.line (#PCDATA)>
<!ELEMENT parsed.last.line (city?, state.prov?, post.code.display?)>
<!ELEMENT city (#PCDATA)>
<!ELEMENT state.prov (#PCDATA)>
<!ATTLIST state.prov
     state.prov.abbr CDATA #IMPLIED
>
<!ELEMENT post.code.display (#PCDATA)>
<!ELEMENT receiving.country.name (#PCDATA)>
<!ELEMENT sending.country.name (#PCDATA)>
<!--   -->
<!ELEMENT mailing.data (pallet.data?, bag.tray.tub.data?, package.data?, zip.code.data?, planet.data?,
carrier.route?, line.of.travel.data?, walk.sequence.num?, acs.data?, code.data?, label.data?, international.data?,
marketing.data?, logical.secondaries?, message.data?, user.data?)>
<!ELEMENT pallet.data (unique.pallet, display.pallet, pallet.zip, pallet.level, pallet.dat)>
<!ELEMENT unique.pallet (#PCDATA)>
<!ELEMENT display.pallet (#PCDATA)>
<!ELEMENT pallet.zip (#PCDATA)>
<!ELEMENT pallet.level (#PCDATA)>
```



```
<!ELEMENT pallet.dat (#PCDATA)>
<!ELEMENT bag.tray.tub.data (bag.tray.tub.indicator, unique.bag.tray.tub, display.bag.tray.tub, bag.tray.tub.zip,
bag.tray.tub.level, bag.tray.tub.dat)>
<!ELEMENT bag.tray.tub.indicator (#PCDATA)>
<!ELEMENT unique.bag.tray.tub (#PCDATA)>
<!ELEMENT display.bag.tray.tub (#PCDATA)>
<!ELEMENT bag.tray.tub.zip (#PCDATA)>
<!ELEMENT bag.tray.tub.level (#PCDATA)>
<!ELEMENT bag.tray.tub.dat (#PCDATA)>
<!ELEMENT package.data (package.num, package.piece.num, package.zip, package.level)>
<!ELEMENT package.num (#PCDATA)>
<!ELEMENT package.piece.num (#PCDATA)>
<!ELEMENT package.zip (#PCDATA)>
<!ELEMENT package.level (#PCDATA)>
<!ELEMENT zip.code.data (zip, plus.four, dpbc.addon, postnet.wxyz)>
<!ATTLIST zip.code.data
    source CDATA #IMPLIED
    date CDATA #IMPLIED
    database.date CDATA #IMPLIED
>
<!ELEMENT zip (#PCDATA)>
<!ATTLIST zip
    check.5 CDATA #IMPLIED
>
<!ELEMENT plus.four (#PCDATA)>
<!ATTLIST zip
    check.9 CDATA #IMPLIED
>
<!ELEMENT dpbc.addon (#PCDATA)>
<!ATTLIST zip
    check.11 CDATA #IMPLIED
>
<!ELEMENT postnet.wxyz (#PCDATA)>
<!ELEMENT planet.data (planet.code, planet.wxyz)>
<!ELEMENT planet.code (#PCDATA)>
<!ELEMENT planet.wxyz (#PCDATA)>
<!ELEMENT carrier.route (#PCDATA)>
<!ATTLIST carrier.route
    source CDATA #IMPLIED
    date CDATA #IMPLIED
    database.date CDATA #IMPLIED
>
<!ELEMENT line.of.travel.data (lot.num, lot.dir, lot.sort.key)>
<!ATTLIST line.of.travel.data
    source CDATA #IMPLIED
    date CDATA #IMPLIED
    database.date CDATA #IMPLIED
>
<!ELEMENT lot.num (#PCDATA)>
<!ELEMENT lot.dir (#PCDATA)>
<!ELEMENT lot.sort.key (#PCDATA)>
<!ELEMENT walk.sequence.num (#PCDATA)>
<!ATTLIST walk.sequence.num
    source CDATA #IMPLIED
    date CDATA #IMPLIED
    database.date CDATA #IMPLIED
>
<!ELEMENT acs.data (acs.pub.id, acs.keyline, acs.check, acs.display)>
<!ELEMENT acs.pub.id (#PCDATA)>
<!ELEMENT acs.keyline (#PCDATA)>
<!ELEMENT acs.check (#PCDATA)>
<!ELEMENT acs.display (#PCDATA)>
<!ELEMENT code.data (customer.keyline, segment.dat, mpuid.dat, edition.code, demo.code, promo.code)>
<!ELEMENT customer.keyline (#PCDATA)>
<!ELEMENT segment.dat (#PCDATA)>
<!ELEMENT mpuid.dat (#PCDATA)>
<!ELEMENT edition.code (#PCDATA)>
```

```
<!ELEMENT demo.code (#PCDATA)>
<!ELEMENT promo.code (#PCDATA)>
<!--  -->
<!ELEMENT label.data (pkg.bgn.end, bag.tray.tub.bgn.end, pallet.bgn.end, entry.zip, entry.type,
entry.load.bgn.end, ddu.zip, scf.zip, adc.zip, asf.zip, bmc.zip, mxd.adc.zip, zone, oel.data)>
<!ELEMENT pkg.bgn.end (#PCDATA)>
<!ELEMENT bag.tray.tub.bgn.end (#PCDATA)>
<!ELEMENT pallet.bgn.end (#PCDATA)>
<!ELEMENT entry.zip (#PCDATA)>
<!ELEMENT entry.type (#PCDATA)>
<!ELEMENT entry.load.bgn.end (#PCDATA)>
<!ELEMENT ddu.zip (#PCDATA)>
<!ELEMENT scf.zip (#PCDATA)>
<!ELEMENT adc.zip (#PCDATA)>
<!ELEMENT asf.zip (#PCDATA)>
<!ELEMENT bmc.zip (#PCDATA)>
<!ELEMENT mxd.adc.zip (#PCDATA)>
<!ELEMENT zone (#PCDATA)>
<!ELEMENT oel.data (#PCDATA)>
<!--  -->
<!ELEMENT international.data (post.code, delivery.mode.code, delivery.freshness.code, delivery.db.start.date,
delivery.db.end.date)>
<!ELEMENT post.code (#PCDATA)>
<!ELEMENT delivery.mode.code (#PCDATA)>
<!ELEMENT delivery.freshness.code (#PCDATA)>
<!ELEMENT delivery.db.start.date (#PCDATA)>
<!ELEMENT delivery.db.end.date (#PCDATA)>
<!--  -->
<!ELEMENT marketing.data (missing.secondary, sfdu.mfdu, seasonal, vacancy, list.code, primary.name.gender,
second.name.gender, last.ncoa.date, completeness, zip.change, latitude.deg, latitude.dir, latitude.alt,
longitude.deg, longitude.dir, county, county.fips, telephone, e.mail, congress.dist, postal.code.type,
dual.address.pref, uncategorized)>
<!ELEMENT missing.secondary (#PCDATA)>
<!ATTLIST missing.secondary
    source CDATA #IMPLIED
>
<!ELEMENT sfdu.mfdu (#PCDATA)>
<!ATTLIST sfdu.mfdu
    source CDATA #IMPLIED
>
<!ELEMENT seasonal (#PCDATA)>
<!ATTLIST seasonal
    source CDATA #IMPLIED
>
<!ELEMENT vacancy (#PCDATA)>
<!ATTLIST vacancy
    source CDATA #IMPLIED
>
<!ELEMENT list.code (#PCDATA)>
<!ELEMENT primary.name.gender (#PCDATA)>
<!ELEMENT second.name.gender (#PCDATA)>
<!ELEMENT last.ncoa.date (#PCDATA)>
<!ELEMENT completeness (#PCDATA)>
<!ATTLIST completeness
    source CDATA #IMPLIED
>
<!ELEMENT zip.change (#PCDATA)>
<!ATTLIST zip.change
    zip.change.date CDATA #IMPLIED
    previous.zip CDATA #IMPLIED
>
<!ELEMENT latitude.deg (#PCDATA)>
<!ELEMENT latitude.dir (#PCDATA)>
<!ELEMENT latitude.alt (#PCDATA)>
<!ELEMENT longitude.deg (#PCDATA)>
<!ELEMENT longitude.dir (#PCDATA)>
<!ELEMENT county (#PCDATA)>
```

```
<!ELEMENT county.fips (#PCDATA)>
<!ELEMENT telephone (#PCDATA)>
<!ELEMENT e.mail (#PCDATA)>
<!ELEMENT congress.dist (#PCDATA)>
<!ELEMENT postal.code.type (#PCDATA)>
<!ELEMENT dual.address.pref (#PCDATA)>
<!ELEMENT uncategorized (#PCDATA)>
<!--  -->
<!ELEMENT logical.secondaries (private.box, pmb, pound.sign, annex, apartment, basement, building,
department, door, floor, front, hanger, key, lobby, lot, lower, office, penthouse, pier, rear, room, side, slip, space,
stop, suite, trailer, unit, unknown, upper, wing)>
<!ELEMENT private.box (#PCDATA)>
<!ELEMENT pmb (#PCDATA)>
<!ELEMENT pound.sign (#PCDATA)>
<!ELEMENT annex (#PCDATA)>
<!ELEMENT apartment (#PCDATA)>
<!ELEMENT basement (#PCDATA)>
<!ELEMENT building (#PCDATA)>
<!ELEMENT department (#PCDATA)>
<!ELEMENT door (#PCDATA)>
<!ELEMENT floor (#PCDATA)>
<!ELEMENT front (#PCDATA)>
<!ELEMENT hanger (#PCDATA)>
<!ELEMENT key (#PCDATA)>
<!ELEMENT lobby (#PCDATA)>
<!ELEMENT lot (#PCDATA)>
<!ELEMENT lower (#PCDATA)>
<!ELEMENT office (#PCDATA)>
<!ELEMENT penthouse (#PCDATA)>
<!ELEMENT pier (#PCDATA)>
<!ELEMENT rear (#PCDATA)>
<!ELEMENT room (#PCDATA)>
<!ELEMENT side (#PCDATA)>
<!ELEMENT slip (#PCDATA)>
<!ELEMENT space (#PCDATA)>
<!ELEMENT stop (#PCDATA)>
<!ELEMENT suite (#PCDATA)>
<!ELEMENT trailer (#PCDATA)>
<!ELEMENT unit (#PCDATA)>
<!ELEMENT unknown (#PCDATA)>
<!ELEMENT upper (#PCDATA)>
<!ELEMENT wing (#PCDATA)>
<!--  -->
<!ELEMENT message.data (mlc.nnn*, mtm.nnn*, mgr.nnn*)>
<!ELEMENT mlc.nnn (#PCDATA)>
<!ATTLIST mlc.nnn
    code CDATA #IMPLIED
    msgnum CDATA #IMPLIED
>
<!ELEMENT mtm.nnn (#PCDATA)>
<!ATTLIST mtm.nnn
    code CDATA #IMPLIED
    msgnum CDATA #IMPLIED
>
<!ELEMENT mgr.nnn (#PCDATA)>
<!ATTLIST mgr.nnn
    code CDATA #IMPLIED
    msgnum CDATA #IMPLIED
>
<!--  -->
<!ELEMENT user.data (unn.nnn*)>
<!ELEMENT unn.nnn (#PCDATA)>
<!ATTLIST unn.nnn
    code CDATA #IMPLIED
>
```

TECHNICAL DESCRIPTION AND DESIGN CONSIDERATIONS FOR GCA ADIS

I. ADIS AND RELATED SPECIFICATIONS

TWO FORMATS

GCA ADIS is published in two formats: a flat file format, with key fields, suitable for building a relational database system, and an XML format for collecting and transmitting address data (currently expressed as a Document Type Definition (DTD), and later as a W3C XML Schema). These two formats are quite different in structure, but the intention is that they be generally interoperable. Though GCA ADIS by definition encompasses both formats, in practice the user may choose to work with either format exclusively or with both formats. One option is to use the XML DTD format to collect data, to store it in the flat file format as an address management tool and then to convert it into a relational database system to support various mail production requirements.

COMPATIBILITY

GCA ADIS is compatible to the greatest extent possible with UN/EDIFACT PROLST format for international postal addresses now under development and the earlier ASC X12 EDI TS101 format for postal addresses. These EDI formats were developed with USPS and industry participation, including that of GCA members. Since use of EDI formats involves a significant infrastructure commitment, they are predominantly used by large businesses and institutions, and not yet often deployed within the mailing industry. The ASC X12 EDI format, TS101, supports only USPS addresses. The UN/EDIFACT PROLST EDI format will support international addresses using externalized address element codes and address templates.

What is intended is address element field level compatibility with certain exceptions. First, the EDI formats sometimes have additional fields included because EDI segments are used in order to obtain certain fields, and these segments have other fields that are not necessarily needed for an address specification. In this case, these other fields may not always be directly included in ADIS. Second, GCA ADIS will have additional fields pertaining to mail production that are not within the scope of TS101 or PROLST. GCA ADIS contains transitional fields to assist users in converting from a line-by-line or address block format to a permanently parsed format. In some cases, GCA ADIS may serve as a proving ground for certain address related fields with the purpose of gaining experience to see whether the fields should be added to the EDI formats. GCA will participate directly in the EDI project teams to ensure that reconciliation of these differences can occur.

EUROPEAN COMMITTEE FOR STANDARDISATION (CEN)

The European standardization organization, CEN, has developed a list of European address elements that will be of great benefit to international address standardization efforts. The CEN TC331 committee plans to do further work on printing rules for addresses, which corresponds in a general way to what we call templates. The CEN is also interested in working on standardized methods for transmitting address files, validating address data, and converting

files from line-by-line and block formats to element based formats. However, they do not consider the identification of mailing production variables to be within the current scope of their efforts.

UNIVERSAL POSTAL UNION (UPU)

The UPU POST*CODE project has begun to develop a list of address elements that will have a worldwide scope. The POST*CODE project team, made up of postal representatives, will coordinate with the European standardization organization CEN in this effort. GCA ADIS will make use of this work as it develops. Through the development of software prototypes, GCA members can play an important role in defining the technology through which the address elements can be managed, transmitted both internally and externally to other parties, and presented as renditions on mail pieces. All of these activities now have the opportunity to be recognized by the UPU Standards Board as components of an international addressing standard that is unprecedented within the over 125 year history of the UPU. The UPU Standards Board has advanced two proposals, one covering the collection and ordering of address elements, the other pertaining to the transmission of address data and its ultimate formatting on mail pieces, to the initial level of Status P within its standardization process. The resolutions by which this was accomplished are incorporated into this document as an appendix.

ELECTRONIC COMMERCE CODE MANAGEMENT ASSOCIATION (ECCMA)

ECCMA offers a Web-based service to manage International Address Element Codes and to support a process to make their definitions and characteristics widely available and readily accessible. ECCMA members can participate in a Technical Advisory Group (TAG) that allows them to submit, review, and decide upon requests to alter or extend the codes to cover additional address elements. GCA ADIS includes a facility to support these codes, which will be referenced within the UN/EDIFACT PROLST standard but externally managed by ECCMA and possibly other qualified bodies. Through a system of code prefixes, users of element based address technology including GCA ADIS will be able to support codes from various entities, including mail production elements which the GCA has begun to define, and to intermix them within applications.

II. COMPARISON OF ADDRESS ELEMENT BASED FORMATS

The common feature of the EDI specifications developed with USPS participation and the two GCA ADIS formats, as well as the principle underlying the UPU and CEN efforts to define address elements, is that address fields are individually identified and separately stored. Within this overall commonality there are differences. The EDI formats have fixed length fields that are generously defined to provide sufficient room to cover known cases. The ADIS/XML DTD has unbounded field lengths so as to cover any possible situation. The ADIS flat file format has, for the address data elements, fixed variable lengths. By this is meant that the user defines the lengths for any given situation, so that each ADIS address detail file has its own particular specified record length, and each field has its own particular specified field length. At the same time, within each file in an ADIS file set, all fields have fixed field lengths, and all the record types have fixed record lengths.

For an international format, it seems undesirable to make all users carry all fields from all countries, even when they are not being used and the user may not even know what they mean. The user also may know the length that is needed in the production system, so it seems pointless to carry superfluous data that would have to be rendered or truncated in any event. By having a fixed record length for each record type on a given file, some additional space is consumed, but programming is easier and errors less likely.

The above differences result in the need to manage field lengths during conversions from one protocol to another. Since the XML format is unbounded, any of the other formats can be converted to it without difficulty. Converting XML to the flat file format calls for one of several approaches. The fields can be made large enough to hold the longest instance in the XML data. Otherwise the XML data will either have to be rendered or truncated to fit into the fields. In order to render the data, rendition rules can be specified as XML attributes on a field-by-field basis, on an optional basis. The same situation occurs when converting XML to EDI. Converting between the EDI format and the flat file format can create a similar problem in either direction, depending on the field lengths chosen for the data base implementation. In these situations, the user is responsible for managing the data.

The flat file format defines keys for relational data base applications, with primary keys in one table serving as foreign keys in other tables. This creates a degree of data redundancy that is helpful when navigating through the data. There is no need to reproduce this sort of redundancy in the XML format, so these fields occur only once, in effect as primary keys. On the other hand, XML is verbose in the sense that tags occur before and after each instance of data. In this respect the flat file format is efficient, since there are only external headers, as in a data dictionary. The EDI format is akin to XML in having field identifiers, though they normally are expressed in a compressed notation and, unlike in XML, are not repeated as end tags.

A feature that is unique to XML is that some of the fields defined in either the flat file or EDI formats are expressed as XML attributes. This could be considered as arbitrary since all the XML field attributes could be defined as separate XML fields if desired. This topic is discussed in many expositions of XML. Some try to define rules for when an entity should be an attribute rather than a separate field, such as the distinction between a property of an element, which would be an attribute, and a part of an element, which would be a sub-element. Others focus on practical considerations such as whether multiple instances of the entity in question are possible. For example, if a book may have multiple authors, then it is easier to make author a sub-element of book. In the ADIS/XML DTD, we have tried to use attributes when there is “data about data”, or metadata, which does not require its own hierarchical substructure.

Another feature unique to XML is support of Unicode, which can represent all the alphabets of the world by using two bytes for each character, in this way defining a character set with 65,536 characters. For example, Arabic, Chinese, Japanese, and Korean are all supported. Unicode is closely related to the ISO 10646 standard and is increasingly supported by computer operating systems such as more recent versions of Microsoft Windows. The ASC X12 EDI and EDIFACT formats will likely be converted in the next few years to XML, either in some form of what is called EDI/XML, or by conversion to an evolving XML standard

such as ebXML. EDI/XML is a hybrid retaining certain advantages and disadvantages of the original EDI technology. As an example of an advantage, there are well-established methods for sending revisions to existing messages and managing the results so that the appropriate outcome is achieved. As a disadvantage, EDI/XML will bring forward the use of message segments which can require additional overhead to carry fields within the necessary segments that may not all be required for the particular task. As for ebXML, it is still in the process of being defined, and is not at this time a full protocol for sending messages, but may ultimately offer more of the advantages of EDI/XML with fewer limitations.

Within XML, the programming language XSLT offers the chance to define needed transformations of the address elements while remaining within the boundaries of a widely accepted standard that is supported more or less equally by such technological competitors as Microsoft, Oracle, IBM, and Sun. It is easier to make transformations in the ordering or sequence of elements than it is to make changes to the element content, but both types of alteration are feasible. For GCA ADIS, it is our intention to use XSLT to define a reference implementation in which the effects of rendition instructions on representative small sample data sets can be made available on-line. The reference implementation will provide complete accuracy with very little concern for efficiency. Those who develop production implementations of GCA ADIS can consult the reference implementation to ensure compliance with the standard, but will certainly need to use more efficient techniques that may be based on particular hardware configurations and corresponding programming languages.

III. ADIS FILES

The ADIS Design Chart provides an overview of the files making up an ADIS file set. Fields defined as keys are indicated in boldface and underlined. In some cases, keys can be constructed from combinations of fields that are present. For example, in the Address Detail file, the address and message template identifiers can readily be constructed, though the necessary components are not necessarily contiguous on the file and may be implied.

In addition to the header file, there are three sets of functional groups of files. First, the production group header file identifies how many production groups are included in the file set, and however many records are in the production group header file, there are the same number of production group detail files and address detail files. The production group detail files include a kind of data dictionary defining the fields, sequence of fields, and field lengths for the address detail files.

Second, the message group header defines how many message groups are included in the file set, and however many records there are in the message group header file, there are the same number of message group detail files. These are not based on production groups, but only on the need for different message record sizes and formats. If the user wanted to have only one message group detail file, this could always be done by making the message group detail file record size large enough to handle any of the data needed for any messages in the file set.

Third, the rendition group header defines, not the size of the detailed rendition instructions, but rather, for a given address or message template, what is the height and width of the output area that will contain the results of the rendition. There is one record in the rendition header

for each template, and all the rendition instructions, identified by template, are found in a single rendition group detail file that has a fixed predetermined length.

At the bottom of the layout for each file type is a notation that explains the frequency of occurrence of each record within each file type.

Three of the boxes on the ADIS Design Chart are shaded, which connotes that multiple files may be present in a file set for each of these three file types.

Two of the file types, the address detail and the message group detail, have a fixed variable format, that is, within a given file set the record lengths are fixed, but among different file sets, the record lengths may vary.

Various useful subsets of the files might exist for special purposes. For example, there could be a file set with just the header, rendition group header, and rendition group detail, if the address detail had not yet been added. There could be a subset with just the header, message group header, and message detail, at some stage in the process. There could be a subset with only the header, production group header, production group detail, and address detail as well. For mail production, at the other end of the spectrum, there could be one of each file, plus some number of additional message group detail files, and some number of additional production group detail files and address detail files.

The ADIS/XML DTD is another file type, which corresponds to the header file, production group header, and address detail file, and is intended for collecting address data or for storage of data in the earlier stages in an address management process. It is quite possible to develop XML representations of other files within ADIS, and the group working on ADIS will be taking this up. One interesting possibility is that the production group detail file could be generated as a byproduct of processing the XML input. Each field that is used as well as the longest field length can be noted during processing. This would constitute a self-generating data dictionary. Of course default lengths could be set and certain fields could be specified to be included even if they were not in the XML data set.

IV. ADDRESS DATA ELEMENTS

ADDRESS ELEMENTS

Elements in ADIS are components of addresses, generally components that can be subdivided no further without loss of functional identity. Some of the elements in ADIS, however, are composite. When this is the case, there may be less initial effort needed to isolate the elements, but more work is needed to render them properly in formatting addresses for mailing purposes.

When we use the term “address data” this is construed broadly to include not just postal address components, but also name components, mailing production variables, and message components.

In general, most address data is currently stored as line-by-line data, and not broken down into components. While ADIS can work with line-by-line data, a main goal of ADIS is to

facilitate operations on elements. This is done in order to achieve better control of the data and ultimately improved address quality. Often line-by-line data is not properly identified when address data is stored, but even when identified, its composite nature limits accuracy in parsing, matching and formatting addresses for mailing purposes.

Given the street address "107 N Main Street", in ADIS, this should be stored as four elements, namely, primary number, pre-directional, street name, and street type. However, the street address "204 Pine Grove Avenue" would be parsed into three elements, namely, primary number, street name, and street type. In other words, "Pine Grove" is an element, though consisting of two words. This is because there is no separate functional significance to "Pine" or to "Grove" in that particular address. Since both "204" and "206" may identify different addresses on Pine Grove, "204" is an element, but the "2" in "204" is not an element.

In some languages, what we have defined as multiple address elements are combined together in a single word. For example, in Germany, we may find "Wilhelmstrasse" which combines a street name and a street type into a single word. In this version of ADIS, we recommend that this be stored in the street name field. Alternatively, a case could be made for breaking it into two elements, provided formatting was properly handled to put it back together. Another alternative would be to recognize an element such as "thoroughfare", which in our view should be identified as a composite element.

MAIL PRODUCTION ELEMENTS

Mail production elements have been defined in this version of ADIS for USPS bulk mailings. The GCA Mail.dat specification provides a complete accounting for these elements, and there are a number of fields in ADIS that are common to Mail.dat. Often there is an exact match, but sometimes there are slight differences, such as the inclusion of barcode check digits in ADIS. We have tried to follow some principles in defining the common fields. First, if a field needs to be imaged on a mail piece, either in full or rendered, then we included it in ADIS. Second, if a field is needed to create either a top level or in some cases an intermediate level link to other data in Mail.dat, it is included. Third, if there is not an exact match of content, there should be a one-to-one correspondence between data values in ADIS and data values in Mail.dat, to provide for interoperability. There are several useful applications that are based on the ability to combine the information from both specifications. If a mailing has both domestic and international elements, then the USPS part of the mailing should be defined as a separate production group, and this production group may be correlated with a Mail.dat file set.

MESSAGE ELEMENTS

Message elements may include fixed components and variable components that are combined to form a customized message to the addressee that may be imaged on the mail piece. There may be a fairly large number of distinct messages that are assigned to different addresses or groups of addresses, and there may be a fairly large number of different message components imaged on a given mail piece. Most of the variable elements, such as name components, will be present in the ADIS address detail file. There may be variable elements designed for limited or one time usage that are not found in the address detail file. An example would be a percentage off discount that is based on the purchase history of the addressee. This kind of

variable would be defined as a user variable and stored on the address detail file. An entire message or message fragments can be stored in the message detail file to avoid carrying redundant data and called in based on a message number stored in the address detail file.

USER DEFINED ELEMENTS

There are several situations in which user defined address data elements may be needed. We have already described the need for a one-time variable for ink jet messaging. There also may be a need for a variable to be passed to a particular type of equipment, which may not be used for other types of equipment. There could be an address data element that is too new to have been assigned a code by ECCMA, GCA, or any other entity. There could also be an intermediate result field that has been populated through an externalized function, which may be used in preference to the rendition engine, or may be too complex for the rendition engine to handle. For all these reasons, ADIS supports user variables, which have codes that will be unique for a particular job, but may not be unique within the community of users. If the user variable is suitable for general use, it can be submitted to ECCMA or GCA for inclusion.

SOURCES

There are many sources for postal address elements, including books, Web sites, proprietary software layouts, postal administrations, regional standards bodies such as CEN, and most recently the UPU POST*Code project.

ADIS recognizes in particular the address elements collected by ECCMA with its International Address Element Code (IAEC), the published drafts of the CEN on European address elements, and the developing UPU effort to define worldwide address elements. For its part, the GCA is defining within ADIS its own nomenclature for address elements, which has the particular goal of including additional mailing production variables and message components which may be imaged on a mail piece. ADIS has the goal of recognizing and providing a framework for utilizing all open sources of international address elements and other related mailing data in the interest of standardization and improved address quality.

ELEMENT TYPES

This version of ADIS recognizes four types of elements. These are ECCMA IAEC codes, GCA address and mailing production elements, message elements which are ephemeral in nature, lasting for as little as a single mailing job, and user defined elements specific to an application. These are distinguished through the code prefixes “E”, “A”, “M” and “U” respectively.

CODE STRUCTURE

The ECCMA code structure is 99.999, where the first two digits represent a class of elements, and the last three a sequence number with no intrinsic meaning other than differentiating the elements from each other. This structure does not support hierarchical relationships among elements, nor does it guarantee that elements normally associated with each other will have consecutive codes. However, it is easy to add new elements, and the number of digits is sufficient to the purpose. In the interest of compatibility in system design, we use a similar

code structure for ADIS, with only a different prefix. The use of the code prefix "E" is an ADIS convention rather than an ECCMA requirement.

ADIS codes do not use the same last three digits as corresponding ECCMA codes, because the ADIS elements are organized into different functional groupings than the ECCMA classes, and sequenced within these groupings, and may not have identical element names. Most ECCMA elements directly correspond with ADIS elements. In the interest of interoperability, a cross-reference of the common elements is provided. Many address elements identified by CEN are represented in the ECCMA code tables as well, and generally these are also defined in ADIS. Certain ECCMA elements are not published in ADIS. These elements may be part of EDI segments that are included in EDI standards such as ASC X12 TS101, but are considered less useful than other elements by the ADIS committee. However, it is important to note that ADIS supports all ECCMA elements, either directly or indirectly, since any element defined by ECCMA can be used in an ADIS template. After all, ECCMA publishes new elements from time to time, and can be expected to frequently update its code tables because of its rapid approval process. Some ADIS elements, however, do not correspond to ECCMA codes. Typically these are the elements representing mailing production variables, which ECCMA does not seek to collect at this time.

In an ADIS file set, each element must be identified with an appropriate code number and prefix. In an ADIS/XML file, each element must carry an attribute with an appropriate code number and prefix. In this way, the different names used for what may be the same elements in ECCMA, CEN, ADIS and potentially other contexts need not cause confusion.

ADIS message elements with an "M" prefix have a slightly different structure from the address data elements with an "A" prefix or the ECCMA elements with an "E" prefix. Instead of the structure reflecting a class and then a member of the class, the message element codes are the reverse, with the last three digits representing a message number, and the first two digits representing a component within that message.

Three specialized elements are included in the address detail file for use when messages are to be imaged on a mail piece. The first takes the form "MLCnnn" where "nnn" is the message number, and the data value for this element is a number representing the location on the mail piece at which that particular message is to be imaged. The numbering for such imaging locations is not standardized within ADIS and is decided by convention among a particular set of users. The second takes the form "MTMnnn" where "nnn" once again represents the message number, and the data value for this element is the template number to be used to render the message. If message data elements are referenced in a message template, that data will be obtained from the appropriate message group detail file. The third takes the form "MGRnnn" where "nnn" is the message number, and the element data value is the message group key that is needed to determine which message group detail file to reference.

Elements with a "U" prefix follow the general convention of two digits, followed by a period, followed by three digits, but the assignment of these digits is left to the user.

As a synonym for ADIS address data element codes, a set of mnemonic codes with up to seven alphabetic characters is provided. For example, the name of a business or organization, which has the ADIS code "A50.030", can also be referred to as "ORGNAME". It was felt

that these mnemonic codes might be more suitable for certain applications since they remind the user of the full element name. These mnemonic codes can generally be used wherever the ADIS element codes are used.

CATEGORIES

ADIS groups its address data elements under the categories of “Key and Link Codes”, “Production and Mailing Information”, “Name Information”, “Delivery Address Information”, “Last Line(s) Information”, “Business Information”, “Data Base Maintenance Information”, and “Marketing Data”, “Message Data”, and “User Defined Codes”. These distinctions are usually straightforward, but in some cases could be disputed. Such disagreement is less than fundamental, however, since elements in all categories can be used in all types of templates for purposes of rendition.

SEQUENTIAL VS LOGICAL ELEMENTS

We found it necessary to carry some of the parsed address data in more than one element, which often crosses over category boundaries. The most important example of this is secondary address information such as “Suite 23” or “# 48”. Though ADIS elements for the most part may or may not be included in any particular ADIS file set, if all elements were used, this secondary information would be carried twice, once in “Delivery Address Information” and once in “Marketing Data”. In the delivery address area, it would be stored in sequential order, from which templates can relatively easily render the data into a mail piece format. In the marketing data area, it is individually identified under a specific secondary designator, which we refer to as a logical approach. The logical approach is less well suited for use in templates, but better suited for data analysis. If both techniques are used at the same time, there is a need to keep the data consistent, but then the benefits of both approaches are available simultaneously. If only the delivery address information elements are used, a small search is necessary to find, for example, a suite number.

As a technical point, there are some secondary designators that do not take a corresponding number. For example “Rear” may appear as an address element in itself, as opposed to “Apartment” which normally has an apartment number associated with it. In this case, the logical secondary element “Rear”, as a convention, will have a secondary number of “-“ to show that the logical element is present. The “-“ will be suppressed during rendition.

The same principle is used in storing name data. ADIS does not try to identify the different parts of a name in specific terms such as “patronymic” or “given name” which are culturally variable and do not necessarily appear in the same sequence on a mail piece depending on the country, language, or nationality. Instead it identifies the parts of a name sequentially in the order in which they are presented. In the future, logical name elements could be defined, and then the same potential for storing name elements both sequentially and logically could be employed at the option of the user.

POSITIONAL SPECIFICITY

In defining address elements, we have followed a principle of positional specificity, which further refines the preservation of sequential order of address elements. This principle leads to

the result that an address component, such as a directional, which may appear in different positions relative to other components, will be represented by multiple address elements. For example, following the organization of the USPS AMS II database, we have both a pre-directional and a post-directional field. Unlike the USPS AMS II database, we define both a preceding street type and a following street type. This is not because we expect that both can be present in the same address, as can occur with directionals. It is to make it simpler to parse and render the address. Even though the USPS may store the preceding street type as part of the street name, when it comes time to abbreviate the street name, it becomes clear that we are dealing with more than one element with different rendition rules. This point also applies to the compound nouns used in German and other languages for identifying thoroughfares. The address matching software can cope with the situation even if the USPS combines what we consider two elements into one, as long as that is done consistently. For many other countries, the preceding street type is quite typical.

Another advantage of following the principle of positional specificity is that it allows the order of the input data to be preserved wherever possible, and modified only when necessary. This conforms to the insight that the sequence of elements in the original input data may often have significance, a point which Peter Moore calls "the wisdom of the input", that is not necessarily respected in a process which calls for individually identifying and separately storing address elements. It also limits the need to try to preserve the original input as yet another field in itself. For example, if there is an unusual construction such as "PO BOX 32 #284" in the input, the user can parse this in a sequential manner without having to resort to putting the data into the "unparsed street address" field. In addition, the "#284" can be parsed into fields set aside for logical secondary address designators and corresponding identifiers.

PARSED VS UNPARSED ELEMENTS

ADIS includes line-by-line composite elements for the major name and address data as well as the last line data. This allows for use of the specification for such tasks as sending unparsed data to downstream operations. The possibilities for intelligent rendition are inherently limited by this approach. If the data exceeds the capacity of the output media in the horizontal dimension, the results may constitute loss of data quality and result in reduced chances for postal delivery. But as a transitional mechanism, the ADIS committee felt that the inclusion of line-by-line composite elements could be helpful. In some cases, the user may know the output capacity for information ahead of time and be able to manage the situation without, for example, having to resort to truncation of data. In other cases, if most addresses can be parsed into their elements and a few cannot, the few can be included in the file on a line-by-line basis and an appropriate simplified template can be called. Finally, if there are difficulties with developing a complex template, the line-by-line option could provide a temporary workaround. For similar reasons, the messaging capability includes a line-by-line methodology as well as the opportunity to process the data through the rendition engine.

It is important to recognize the relative improvement provided by ADIS even when the unparsed option is used. In many current systems, address data is stored line-by-line and it is not clear what data is in which address line. For example, the street address line may be found in one of several places, with even more variance on business address and international files. The ASC X12 EDI format TS101 improves upon that by naming the lines, so that the

name of an organization, for example, can be found in its own field. It also has a full set of parsed fields, and an option on a record-by-record basis to use either the parsed or unparsed fields, or a combination of both. However, EDI formats, as well as the ADIS flat file format for that matter, have no way to prevent the data from being stored in both unparsed and parsed formats at the same time, creating potential maintenance and quality control issues. On the other hand, the ADIS/XML DTD guides the user to choose for each address either the parsed or unparsed option, but not both, thereby taking a further incremental step forward.

By gaining experience with ADIS, users will discover for themselves that many of the benefits, such as the ability to do intelligent rendition, as well as improved address matching and deduplication, are dependent on parsing each address. For this reason, we would consider it a positive step from a methodological viewpoint if later versions of ADIS were able, after a transition period, to eliminate the unparsed address fields.

V. TEMPLATES IN ADIS

DEFINITION

An ADIS template is an ordered list of address data elements, which may or may not be populated in any given instance, arranged in a matrix in groups corresponding to lines of output information in such a way that the data contained within the elements will produce a mailing address, order form address, ink jet message, or other desired outcome. There can be a number of templates for a particular job, and the templates are called from an address detail record under control of the user.

Incorporated within each template typically will be found a set of rendition instructions, which define various functions and operations that can be performed upon the address data elements. This is done in order to ensure that the output from processing the template preserves the information necessary to achieve postal delivery, maintain quality control in production, and communicate with the addressee, even when limitations of the production equipment require that some of the available information will not fit on the mail piece.

TEMPLATE IDENTIFIER STRUCTURE

An ADIS template is identified by four components, though not all are needed in all circumstances. The first is the country code, in the two character alphabetic ISO standard code. The second is a user code that identifies the owner or designer of the template, and may equate to a licensed Mail.dat user code. The third is a template type code, which in some cases can be assumed from the context. Template types that have been defined for this version of ADIS include “ADR” for address information and “MSG” for messages, including order forms. The fourth is a three-digit template number, which allows for up to a thousand variations within a country, which seems to approach the outer limit of what can be managed. As a general rule, the template number must be unique within the country code, except that address and message templates may share the same number.

During the development of ADIS, there was a concern that in many situations the use of alternate templates rapidly multiplies, that is, with two independent conditions that each has two alternatives, four subtemplates are needed, but with three independent two-way variables,

eight are needed. For example, if there needed to be a template for Puerto Rico addresses as distinct from U.S. addresses, and one for Post Office boxes as distinct from street addresses, then since there are both Post Office boxes and street addresses in Puerto Rico, a total of four templates would be needed. With too many situations of this kind, the number of templates could rapidly multiply to a number that would be difficult to manage.

The basic rule is that each time address data elements must appear in a different order within a line, or whenever lines must appear in a different order, a new template is needed. This could be circumvented in future versions of ADIS by allowing conditional logic, such as "if-then-else" statements within the rendition instructions. The ADIS committee felt that this would be tantamount to devising a small programming language and decided that for this version of ADIS it would be best to define commands and functions, including some that support a choice among alternatives, but stop short of full conditional logic. This will also allow consideration of other alternative ways to represent rendition instructions that might reduce development costs.

After some study, those working on ADIS and other address element technology initiatives believe that by consistently taking advantage of the situation in which one template can be defined as a subset of another template, the multiplication of templates can be reduced to a minimum. For example, consumer address templates can be defined as a subset of business address templates. Mabel Grein of USPS has identified eight core postal templates that can represent virtually all the USPS addresses as presented in USPS Publication 28. These templates are included in this document as an appendix. While these eight templates represent the necessary name and address information to create a valid address label, they would typically have to be customized to reflect user specific mailing production information, such as an Optional Endorsement Line (OEL) or Postnet barcode. Nevertheless, if a USPS mailing can indeed be done by calling one of eight templates for each address, then ADIS will have met a design goal for domestic mail production by essentially automating Publication 28.

As further work is done on templates, including developing preliminary templates for many countries, and then defining standard templates with the help of the UPU POST*Code project, the ADIS user will increasingly benefit from the opportunity to incorporate standard templates into an application, customizing them as necessary to add proprietary features.

At this stage, the logic to call the appropriate templates is the responsibility of the user. For example, the user may check on the presence or absence of data in certain address data elements, and consider preferences for which information is included or excluded, which may be based on the purpose of the mailing. This logic is externalized and can be carried out at the time of mailing or well in advance, utilizing any technology that may be appropriate.

VI. ADIS MESSAGES

ADIS messages are supported with several formatting options. The first is a line-by-line format with address data element codes allowed as embedded inserts within message data, adapted from the 1986 version of ADIS. The symbols ")(" are used to precede an element code so as to permit the data contained in that field to be interpolated into the text. In ADIS, the symbol ")" will also be required to follow the element code. This has the advantage that mnemonic element codes of varying length can be supported without ambiguity. The text is

line-by-line, so the user should allow for the longest possible insert to avoid the possibility of truncation at the end of the line. The value of the longest possible insert will be contained within the ADIS file in the flat file format, so this calculation can be made precisely. A simple message template is needed in order to produce the rendered output. This method is not very efficient in its use of message space, but it is straightforward and relatively easy to use.

The second method uses more of the capabilities of the rendition engine and supports word wrapping. The data is stored in the message detail file as in the first method. A "WRAPDN" command is used to take a single logical line of data and determine physical line breaks based on word boundaries within the text or the inserts. This process is subject to being reiterated, if it turns out that the entire text plus inserts do not fit into the message space. Any rendition instructions that would shorten the inserts or perhaps prioritize the message fragments can be invoked to produce a message that fits into the space. Alternatively, embedded inserts that contain address data element codes can be used, but then the rendition instruction commands and functions cannot be utilized. Once nothing else can be done to fit a message into the target area, truncation will be the last resort. This method is more efficient in its use of space, but more complex and for that reason should be used judiciously.

ADIS can support up to 1000 messages in a file set, and in theory any number of those could be imaged onto a single mail piece. As a rule, the message number must be unique within the country code.

VII. RENDITION INSTRUCTIONS

COMMANDS AND FUNCTIONS

Given a set of address data elements, the rendition instructions must be able to produce the label text and message text while fitting within a predefined vertical and horizontal space.

Rendition instructions include templates, commands and functions, which are presented in the ADIS flat file format in a matrix structure. Commands are invoked through keywords and functions are invoked through populating matrix elements with data. Though the order of presentation of the lines and fields in the templates is basically sequential, the order of operations is not sequential, instead being governed by a defined set of rules that we will present and explain.

Following is the rendition instruction command set for this version of ADIS, with keywords followed by the description of the operation:

REDUCE: eliminates vowels except the first in a word according to standards in USPS Publication 28. An XSLT version of this command is included in this document as an appendix. This could be extended to eliminate double consonants, and to reduce noise words and syllables if these are defined in a table. As an example of noise, "Avenue of the Americas" could be shortened to "Avenue Americas" since "of" and "the" convey little information.

ABBREV: substitutes an abbreviated form if known either generically or specifically. Abbreviation tables under user control enable the generic abbreviation, and an XML attribute can be used to support a specific abbreviation.

INIT: substitutes the first letter for the full element, for example “John” becomes “J”.

ELIM: eliminates the element content based on a specified priority of operations.

OVERLAY: inserts a fill pattern, for example asterisks in an OEL, that is subject to overlay by other data. The other rendition instructions do not allow data to “cover up” other data. Single or double quotation marks are used to demarcate the data. Using the keyword “ALL” followed by a single space before the quotation marks results in the data being repeated until the specified number of characters has been filled.

LITERAL: inserts a literal of varying size not subject to overlay. Once again, single or double quotation marks are used to demarcate the literal, and the keyword “ALL” followed by a single space before the quotation marks results in the literal being repeated until the specified number of characters has been filled.

CONCAT: inserts a literal if and only if the elements immediately preceding and following are both populated. This command is an exception to the general ADIS rendition rule that a single space is the default delimiter between successive elements. With this command, there is no default to a single space, but if needed, it can be explicitly specified. Single or double quotation marks are used to demarcate the literal. One use of CONCAT is to place a hyphen between two parts of a postal code when both are present. A null value can be specified using CONCAT with single or double quotation marks with nothing in between. In this way, elements can be directly concatenated. A similar effect can be obtained by using message data element codes with embedded inserts, since the inserts are delimited by an initial “)(“ and a final “)” and here too, no single space delimiter is assumed.

WRAPDN: moves part of a line down to an immediately following new line, operating on either a segment or group of elements, an element, or words within an element. If a segment is defined that includes multiple elements, the command applies to the segment. If the segment includes just one element, the command applies to the entire element. If no segment is defined, the command applies to each word in the element. In this version of ADIS, the boundary between words for this purpose is delimited by a single space.

WRAPUP: moves part of a line up to an immediately preceding new line, operating on either a segment or group of elements, an element, or words within an element. The conventions applicable to the WRAPDN command are followed.

Following is the rendition instruction function set for this version of ADIS, with the function name followed by the description of the function:

Line Number: denotes the logical line number, which during the rendition process can result in multiple physical lines, which are also referred to as a line group. If the output media can hold, for example, eight lines, there can be more than eight distinct numbered lines in the

rendition instructions, since as a result of processing the number of lines in the output will be reduced as may be necessary.

Line Priority: determines order of lines that can be omitted in the output if there is not enough vertical space, that is, too many lines with populated data to meet the output criteria. Each line must have a unique numeric line priority, unless there is no question that all the lines can fit into the available space, so that this procedure can always be carried out.

Line Command Priority: determines order of shortening events that operate in horizontal space, that is, affecting the width of a line. A command priority of zero denotes that the operation will be carried out unconditionally, regardless of the need to save space. The exception to this is a "WRAPUP" or "WRAPDN" operation, where zero priority does not connote completely unconditional execution. In any case, for priorities greater than zero, the priorities within a single logical line will be carried out in order, with the lowest number denoting the highest priority, until the horizontal constraint is met, and then if necessary, truncation will occur as a default.

Element Substitution: allows specification of two elements in such a way that if the first is populated, it is nominated to the output, while if the first is unpopulated and the second is populated, the second is nominated to the output. Additional operations may follow that further affect the output data.

Line Merge: Also referred to as combining, this function allows two or more lines to be combined into a single line in any order, with the result nominated to any of the lines that are being merged. In the template, the lines combined are marked with a number, and if there are more than one set of lines marked in this way, the lowest number has the highest priority. It is not necessary that the lines to be combined are consecutive in the original numbering.

Line Segment: Allows definition of single elements that cannot be subdivided or of multiple fields that must travel together during a wrap up or wrap down operation.

Line Compress: Allows lines to move up to eliminate a blank line, or alternatively, when not used, permits blank lines to remain in the output.

ADIS Key and Second ADIS Key: These fields store ADIS address element codes, ECCMA address element codes, ADIS mnemonic codes, or ADIS message element codes. Typically only the first key is used. But when the second key is also specified, the rendition engine must check the data referenced by the first element code, and use it if the element has data content other than spaces. If the element has null content or only spaces, then the data that is referenced by the second element code will be used. This allows for such uses as preferring a nickname if available but settling for a first name if that is all that is populated. The rendition commands such as "INIT" are then applied to whatever data has been referenced.

Left and Right Justify: allows a variable length string of characters to be aligned either leftward or rightward from a specified fixed boundary.

Starting Position: each element is nominated to the output based on its starting position, either left justified or right justified, in a rectangular grid whose size is determined by the rendition

header record. The characters "***' are used to signify that an element follows its predecessor with a default delimiter of a single space. There is a limited ability to employ a different delimiter using the "CONCAT" command or embedded inserts within a message data element. When the starting position is a number, the element will start at that position. The number "001" or the "***" characters can be used to determine the leftmost position in the grid. The literal "EOL" or "***" can be used to denote the rightmost position in the grid. This enables the right margin to be changed in the header in some cases without having to change anything else in the template.

Character String Length: used to denote the length of a literal or overlay, and in some cases to force trailing spaces which otherwise would be suppressed. This can result in truncation if it is used injudiciously.

Truncate: not an explicit operation, but rather the last resort to ensure that the horizontal space requirements can always be met, if necessary sacrificing some of the valuable content, but in a way that can be tracked and reported upon. The mechanism that forces the vertical space requirements to be met, if all else fails, is the line priority.

Examples of Output Lines or Line Segments:

Optional Endorsement Line
Key Line
Mail Stop
Mailee
Name
Second Name
Alternate Recipient
Individual Title
Functional Title
Department, Division
Business/Firm Name
Secondary Delivery Address
Primary Delivery Address
City/Town, State/Region, ZIP/Postal Code
Country Line
District/Locality/Urbanization
Dependent Locality/Proximate Town
Postnet Barcode
Planet Code

SATISFYING BOTH VERTICAL AND HORIZONTAL CONSTRAINTS

Some of the commands and functions within ADIS are designed to affect horizontal space, that is, the number of characters on a line. Others affect vertical space, that is, the number of lines. In some atypical situations, the operations could temporarily make things worse, in other words, add to the width of a line or the number of lines in the interest of preserving the essential data affecting output quality. But such anomalies are only temporary. The rendition instructions are defined in such a way that the data will always fit into the output space

available, though at some point, which can be observed and tabulated using a rendition quality indicator, data quality is necessarily reduced.

The vertical aspect of rendition requires us to consider lines, line groups, and line segments, not individual elements, though segments with just one element are possible. Why do we need line segments? For example: 104 N Main St Apt 1—if wrapping up, Apt and 1 must go together. To do this, Apt and 1 can be considered as a line segment and moved together. Why do we need line groups? If a firm name, for example, is represented on two lines, then it is a line group. Line groups are not defined in the templates but must be accounted for in the implementation. If deleting a line, when the line has been rendered on two physical lines as the result of, say, a wrap down operation, then both physical lines must be deleted.

For bar codes such as USPS Postnet and Planet Code there is also inter-line spacing to be considered, but that topic brings in a lot of complexity. We limit our task for now to defining the operations needed to correctly handle lines and characters. The issue of inter-line spacing is at this time the responsibility of the specific implementation of ADIS, not yet defined within the standard.

How can we define a standardized approach to rendition that satisfies both vertical and horizontal constraints while preserving the essential content? For each address or message, the first step in rendition is to make an unconditional rendition, to see where things stand. Then a check can be made to see if the data fits within the horizontal and vertical constraints without any operations needed to make it fit. If so, then it is only necessary to output the data and move on to the next address. If only vertical constraints are violated, a procedure can be followed which looks only at those operations. Similarly, if only horizontal constraints are violated, a procedure can be followed which looks only at those operations. The potentially difficult case is when both vertical and horizontal constraints are violated.

In ADIS, we propose to examine the vertical issues first. This does not mean that it is impossible to take the opposite approach. We do want to define a consistent method for doing the rendition, so that the standard will produce the same results in different implementations. Some points will become clear as we continue.

We need to consider the wrap up and wrap down operations, and the combine operation. These are the only operations that affect both dimensions. As for wrap up and wrap down, normally they would not be done if there is a vertical constraint. It just makes the problem worse. But we can include a capability to require them to be done to alleviate horizontal pressures even if there are vertical issues. Prioritizing wrap up and wrap down in this manner will of course mean that other lines will then have to be combined or eliminated to solve the vertical constraint.

USPS Publication 28 supports the concept of preferring horizontal solutions, such as appropriate abbreviations, over wrapping up and down, when possible. ADIS supports prioritized wrap up and wrap down to provide options for users, but under the condition that the template designer must specify these priorities explicitly. Since the way is left open to alleviate horizontal pressures by prioritized wrapping up or down, then doing vertical rendition first does not get in the way of getting a good solution, even in situations where most of the problems are in the horizontal dimension.

The prioritized wrap up and wrap down operations will be done whenever there is a violation of the horizontal constraint, even if doing them makes the vertical constraint worse. In other words, if we have nine lines already and need to end up with eight, we would still do a prioritized wrap up even if it temporarily creates ten lines, providing that there is too much horizontal information on the line. This means that wrap up can be given priority over, for example, abbreviation.

These prioritized operations are not unconditional, since we do not want to do them if there is no horizontal constraint. To implement them we propose the convention that the line command priority is zero. This has a different meaning than unconditional execution, since lack of need would prevent execution of the operation.

At other times we may want to consider wrap up, but only under the further condition that it does not make the vertical constraint worse. For example, we might want to wrap up only if there are eight lines available and seven lines populated with data. Or we might want to consider it only after trying other operations such as abbreviation. ADIS supports all of these alternatives in the interest of offering a full set of options in this area.

Next there is the combine operation. It is a way of eliminating lines without losing, or at least without entirely losing, the content of these lines.

But how can we do the horizontal operations on combined lines? Since we cannot be sure that they need to be combined, each has its own defined command priorities. It would be helpful to do the horizontal operations on at least these lines before combining them. But the horizontal operations only need to be done to the extent necessary to allow the combined information to fit horizontally.

We propose that all the horizontal operations on the line with the lowest priority number, that is, the highest priority line, be deferred until all the horizontal operations on the line with the highest priority number, that is, the lowest priority line, have been completed first. This preserves the information that the user has defined as of the greatest value for the longest time. Again, this presupposes that each line be given a unique line priority number, with lower numbers representing higher priorities.

This leads to the following detailed procedure for doing vertical rendition:
1) do wrap up operations only if the priority is zero and there is a horizontal constraint, respecting segment, element or word boundaries as specified
2) do wrap down operations only if the priority is zero and there is a horizontal constraint, respecting segment, element or word boundaries as specified
3) eliminate any blank lines not required to be maintained
4) if still vertically constrained, do any combine operations that are possible, after doing the horizontal operations on the lines to be combined only to the extent required, doing the operations first on the least important line as determined by line priority number
5) do any line eliminations that are necessary in order to solve the vertical constraint

Now we continue by working on the horizontal constraints. We do not know whether or not there is vertical space available, but there may be some. However, since all operations to

solve vertical constraints, including prioritized wrap up and wrap down, combines, and elimination of lines will already have been done, we can be sure that the vertical constraint has already been resolved.

6) perform all horizontal operations that are unconditional, that is, with priority of zero
7) perform any remaining horizontal operations in priority order as indicated, including unprioritized wrap up and wrap down, but only as required by the horizontal constraint, and if vertical space is available, and other operations with a higher priority have been done first
8) use truncation as necessary as a final step to solve the horizontal constraint

These steps, including truncation as a last resort, will always solve the horizontal constraint. Therefore the general procedure for executing rendition instructions can be defined as the procedure for vertical rendition followed by the procedure for horizontal rendition. To develop an ADIS rendition engine, these procedures must be strictly followed to ensure compatibility. Compliance testing will be made available to promote consistency and depth of standardization.

The output of the rendition instructions can be considered a result of a process, which can be the end of the matter, or provide the input to another process. In future versions of ADIS, the intention is that the output could be taken immediately into another process within the same set of rendition instructions. In this version, that would require a separate set of rendition instructions. For any ADIS implementation, the output from any conforming rendition engine should be the same, if the input data and the rendition instructions are the same. This will have to be established through conformance testing.

SOME ASSUMPTIONS

An assumption that should be explicitly stated is that one blank space is assumed to be added as a default between elements when performing rendition. If more spaces are needed, they can be explicitly inserted. In future versions of ADIS, consideration will be given to a way to override this default of a single space for maximum flexibility. In this version, there is a limited capability to accomplish that using the “CONCAT” command, which can insert a different delimiter, or none at all, between elements during rendition. The use of embedded inserts within message data elements can achieve similar results.

A second assumption is that trailing spaces are suppressed, while leading spaces are retained. If an element has both leading and trailing spaces, then which spaces are retained and which are suppressed could depend on whether is it left or right justified during rendition.

INTERMEDIATE RENDITIONS

Some participants have asked for a facility to be defined for intermediate renditions, that is, combinations of address elements with some initial rendition already accomplished, to be used as building blocks for further construction. This would appear not just helpful but almost necessary if for example, a complete ink jet tape format is to built out of an address block, a message block, and some control blocks. On the simpler level, a composite name component could be built from name elements with, for example, the middle name always presented in the form of a middle initial, as a matter of style. In this version, ADIS supports

this concept, but only to a certain degree. For example, the ZIP code is defined in terms of its atomic elements, including the distinct possible check digits, but there is also a field for the "display ZIP" which can include a hyphen. This is not an atomic field any longer but a composite field, in this particular case representing an intermediate rendition. Through defining user elements, other such composites can be built up outside the rendition engine. The unparsed name and address fields are composite fields as well, but in that case there is no clear relationship to underlying elements.

Another example of a kind of intermediate rendition thought to be worthy of inclusion in ADIS is a partial rendition of the Postnet and Planet barcode formats. Although each of these barcodes has its own way of representing digits, both of them can be defined in terms of four primitives. These are two tall bars, two short bars, a tall and short bar, and a short and tall bar. This is sometimes particularly useful because these four primitives may take up the same space as, for example, one alphabetic or numeric character. Representing these arbitrarily as the letters "W", "X", "Y", and "Z", we have included two fields using this nomenclature, one for Postnet and one for a Planet Code. They include the appropriate check digits, thus taking a burden away from the end user.

VIII. PRODUCTION GROUPS

A production group in ADIS is created at the discretion of the user to divide address detail files set into different sections that may need different sets of fields, different handling or output formats of differing type or size. For example, with data from thirty countries, there could be one production group, or five representing regions, or thirty representing countries, or sixty if each country has two different types or sizes of output format for any reason.

Production groups do not come into play when determining message groups, message numbers or template identifiers. Template numbers must be unique within the country code, except that address and message templates may share the same number. Similarly, different production groups may use different sets of messages, but message numbers must be unique within the country code. The main reason for that is that production group definitions are volatile, and it would not be unusual if several production groups were combined into one shortly prior to mail production, or one production group was subdivided. This could create ambiguity in calling templates or retrieving message components. To avoid this, production groups do not affect assignment of message numbers or template identifiers.

The other side of this coin is that if several countries could share the same templates or messages, it may be necessary to repeat the information. This could be avoided with user defined country group codes or by using language codes in place of country codes. Although this version of ADIS does not specify such alternatives, no method has yet been included to validate country codes.

The main benefit from using production groups is that a different set of fields, or different field lengths for the same set of fields, can be used in the address detail. In this way the user can avoid carrying all the fields needed for any part of the world in each record in a file set that represents data from many countries.

For each production group, ADIS defines a kind of data dictionary, in which each field to be used is defined by its code number and assigned a length that will be constant for the entire production group. Even if one or more records have no data in a given field, the field must be present for the entire production group and the field length must be the same. This is a key part of the fixed variable design that is how the address data elements are stored in the flat file format within ADIS.

In addition, quality statistics are kept on all the data in each field within a production group. These statistics can only be determined at the end of the run, so an ADIS system should collect them along the way and write them out after all the records in a production group have been encountered. The first statistic is the percentage of population of each field within the production group. To be sure, this creates an overhead cost, but it has been shown to be helpful in understanding the data content within a file in order to make production decisions without having to reprocess the entire file. The second statistic is the longest data value in the field within the production group. This is sometimes trivial, but in many cases it is helpful when setting up message with inserts or transferring data among different formats or into a data base application.

IX. SCENARIOS

INTERNATIONAL ADDRESSES

For other than U.S. addresses, it is recommended that the postal code field be used. It can be adjusted to any length as may be needed. Production groups can be used for each country, or if the templates are similar, several countries can be combined into one production group.

Canada is directly supported in ADIS with address hygiene fields to support delivery mode preparation and postal container types needed for presorted mail.

If mailing into a country from outside, the receiving country name typically is included on the mail piece.

USPS ADDRESSES

Eight basic templates are needed for USPS addresses, based on our study and discussions. The postal data needed for these templates is presented in this document. ADIS users are encouraged to modify these templates with additional information to facilitate mail production and to achieve work sharing discounts.

GCA ADIS is designed to allow data to originate with an owner of address files, who may also be a postage payer. Experience will show whether such data owners use ADIS as a means of constructing a flexible address management system, or as a means to pass data from an existing system to another party in the process.

The ability to store both USPS and international addresses in the same system may tilt the balance toward using ADIS not just to transmit data, but for long term address management.

CASS certified address coding software normally performs both a parsing and a matching function. If ADIS is used to store permanently parsed addresses, then such software should have an input point allowing direct access to the matching function, with an updated ADIS file as an output option.

In an ADIS environment, it makes sense to keep the standardized address fields provided by CASS certified software rather than retaining the original input, since the specific parsing results enabling the match are retained, and these will correspond directly to the coding assignments.

Deduplication of addresses is much simpler using ADIS files, since parsing will already have been carried out, and matching of field against field will be more direct. There is still a need for near match logic, but this should be confined more to names, as standardized address elements can be retained.

When presorted mailings are prepared, the opportunity to generate both an ADIS file and a corresponding Mail.dat file should not be overlooked. Many useful applications can be based on having this combination of a standard mailing summary file and a standard address data file, at least for the USPS and Canadian addresses.

The Mail.dat file can be sent on to the USPS by participants in the PostalOne program along with the actual mail pieces. So the ADIS file may originate earlier in the production process than the Mail.dat file, but the Mail.dat file retains its usefulness longer.

Potentially an ADIS file could be an efficient way to send data to the USPS for ancillary services that could be offered such as appending missing secondary designators and numbers.

ADIS/XML DTD

The ADIS/XML DTD will be most useful for the collection and dissemination of address data. In this version of ADIS, a complete XML based production system is not yet defined, though users could initiate development along these lines. The advent of XML schemas in the future will help provide more rigorous quality control for address data transmitted using ADIS.

ADIS FLAT FILES AND RELATIONAL DATA BASES

The ADIS file set can be created from ADIS/XML data or from other formats by the mail preparer as an input to later processes, or as an output from proprietary processes.

Several different types of relational data bases can be constructed using the ADIS flat files as a foundation. To do this, unique sequence numbers should be populated, and appropriate keys and foreign keys should be defined.

ADIS FLAT FILES WITH MESSAGES AND RENDITION INSTRUCTIONS

Production systems with this full set of capabilities can be created by the mail preparer on the output side, or by the mail producer on the input side. These can take the form of relational

data bases, linked flat files, or large files with redundancy, depending on the purpose and efficiency considerations.

CORRELATION WITH MAIL.DAT

Fields in ADIS that are shared with Mail.dat have been included either because they may be imaged on a mail piece or because they provide a direct link to a specific file within Mail.dat. Examples of fields that can be used for linking include the Mail.dat user license code, formerly called the Mail.dat provider code, the Mail.dat job number, the unique pallet number, the unique bag, tray or tub number, the Mail.dat segment number, and the mail piece unit identifier, or MPUID. The fields that are common to Mail.dat and ADIS are listed with an asterisk. In some cases, ADIS carries both a short code that is used in Mail.dat, and a lengthier USPS code which directly parallels the Mail.dat code, and which may be imaged on a mail piece.

EXTERNAL TABLES

External tables will be needed in a full ADIS production system to provide generic capability for abbreviations, that is, to allow every Frederick to be rendered as Fred when this is desired. Tables will also be needed to validate directionals, and eventually city or town names and street names. In this version of ADIS, the user is responsible for developing and maintaining such external tables and for calling them as appropriate.

VALIDATION

Beyond validation of data elements, there is the need to validate address records as a whole. ADIS provides indicators that can be used when adequate postal data is available to identify an address as complete and to pinpoint certain types of deficiencies.

There is also a need to be able to state that a given ADIS file set is internally consistent. The committee will take up this issue and provide the criteria for making this determination.

Finally, the need may arise to show that a combination of a production group within an ADIS file, together with a Mail.dat file corresponding to that production group, are mutually consistent. This issue will also be taken up as the need warrants.

X. APPLICATIONS

DATA QUALITY

For all types of addresses, the use of GCA ADIS can significantly improve data quality. Early on, during the acquisition of address data, parsing the data into an ADIS format will allow validation of individual components and in some cases, identification of missing components, before a customer hangs up the phone or leaves a Web site. Development of an international standard can allow for products that can serve broader markets without having to be tailored for an endless series of proprietary formats that may have limitations of one sort or another.

The USPS has an advanced address management system, and uses its CASS certification program to ensure that address coding and matching software can pass rigorous tests. However, once a certified system is run in a production environment, the parsed data can be and often is discarded, the addresses on mail pieces may not be standardized, and data can be truncated or omitted to fit the production requirements, all without violating requirements. Nonetheless, the mailer may be subject to the penalties that can be assessed by external reality, in the form of slower mail, delivery, lack of delivery in some cases, and reduced response rates. This situation is not unique to the USPS, but is applicable to a greater or lesser extent in every country.

In our view, GCA ADIS offers the first opportunity to the mailing industry and to the postal services to use an international standard to measure and control the quality of the data on the actual mail piece. This is accomplished by populating a rendition quality threshold field with a number representing the last operation that can be carried out before the quality of the output from the rendition engine will fall below acceptable levels. This judgment can be made by the user, but it could be specified by a postal service. Then during the rendition, if this threshold is exceeded, the address detail is updated with an indication that the record has been subject to an operation that is not recommended or to default truncation. At the end of the run, statistics can be generated on how frequently the quality standards have been met. Using this feature would allow mailers for the first time to know, for example, that they should not print labels five across, but ought to print them not more than four across a page. The quality measurement obtained in this way may still be relative to the initial data quality. However, if this technique is combined with a measurement of initial quality, such as can be obtained by populating the address completeness indicator, where data is available to support that element, then there is a basis for claiming that quality levels have been maintained throughout the process. To include this capability in an international address standard developed under the auspices of the Universal Postal Union would certainly help insure that such a standard is widely utilized.

INTERNATIONAL MAILINGS

Address quality levels on international mailings are generally lower than those for a single country with which the mailer may have the advantage of familiarity and knowledge of available systems and software. Further, international mailings often have more expensive postage than those mailed at domestic rates. This means that there is additional value from data quality in an international context. From these considerations alone, the advent of increased standardization can potentially be helpful. Further, the UPU POST*Code project may result in data becoming available from the UPU as well as from private firms that would enable validating of key address elements, even when it is not possible to validate the delivery point itself. In addition, as international direct mailing continues to grow, it will be economically efficient to use the same format for mailings to all countries, as opposed to separate formats for domestic and international mailings. Further, in the case of U.S. mailers, there are often ill advised efforts to cram international addresses into domestic formats that often lack adequate space per line as well as sufficient numbers of lines.

With the advent of GCA ADIS and the files to be made available from the UPU through the POST*Code project, several useful applications can be developed. One example is showing which addresses in a file are likely to be defective by comparing the available data elements

to the data model and validating them against the UPU data or proprietary data. Unless there is good reason to think that mailing to specific probable defective addresses will succeed, the mailer will benefit by restricting the mailing to those addresses that pass the quality checks.

BUSINESS ADDRESSES

Business addresses in any country may require use additional lines in comparison with consumer addresses. This makes the issues associated with properly identifying information, eliminating duplicates, and formatting the mail piece more complex and harder to resolve. ADIS is designed to foster improvements in each of these areas, and can eliminate the need for separate systems and software for business addresses. The use of indicators to identify complete and correct addresses would be helpful in isolating cases in which a mail stop is needed for delivery. In the U.S., firm bundles can be created when several recipients are located in the same building, but existing systems often fail to identify this opportunity for postage savings.

USPS ADDRESSES

As part of the investigation of the feasibility of an element based address standard, GCA conducted a comparative study of USPS CASS certified software systems to see what kinds of addresses caused difficulties for these tools and to evaluate the underlying causes. The results of the GCA Parsing Derby results suggest that two-thirds of the variances in postal coding for USPS addresses among CASS certified software packages can be attributed to parsing differences, sometimes occurring in conjunction with matching differences. These variances included addresses coded by some packages and not by others, as well as addresses coded differently by various packages.

Mike Murphy of USPS states that the average coding rate for domestic addresses is about 92%, which leaves 8% noncoded. Not only do these noncoded addresses lose the opportunity for postal discounts, but deliverability can be negatively affected because of missing or erroneous elements. Beyond this 8% number is another significant number of addresses on mail pieces submitted to the USPS that are coded, but not to maximum depth, because of missing secondary information or other defects. Through the use of ADIS it will be possible to reduce the number of defective and noncoded addresses, though not of course to eliminate the problem. For example, there would remain coding differences and failures to code based on variances in matching elements to the USPS database.

ADVANCED ADDRESS QUALITY

Several indicator fields are provided in ADIS to encourage use of the USPS Delivery Sequence File (DSF) and to obtain benefits from so doing that last beyond the mailing for which the DSF is first processed. These include a completeness indicator that shows when an address exactly matches a DSF delivery point. There is a missing secondary indicator that can optionally be populated with information which corresponds to particular DSF footnotes, making it easier to isolate records needing additional information to improve delivery and in some cases, to obtain maximum depth of code for DPBC bar coding. By retaining this information within the format, it need not be looked up again and again. Vacancy and seasonal indicators are also provided that can be populated based on DSF information.

The USPS is moving forward to provide new methods for determining whether an address is complete and correct. The National Change of Address (NCOA) system already provides such information for the new addresses supplied by movers. A delivery point validation system has been announced which will be more widely available to mailers than the strictly licensed DSF and will at a minimum provide the opportunity to confirm or deny whether a submitted address matches one of the over 140 million USPS delivery points. Because of the additional costs to the USPS of delivery to incomplete or defective addresses, it is not impossible that postal rates may in the future vary based on address quality, even for addresses that receive full discounts under current standards.

In general, ADIS allows address coding information such as ZIP code, carrier route, walk sequence, and line of travel data to be marked up with the source, date and USPS database date to allow for determination of freshness and discount eligibility. Currently, this information is rarely retained in address management systems, leading to redundant efforts to code an address even when neither the address itself nor the applicable USPS database has changed.

LINE OF TRAVEL

A feature included in ADIS is full support for Line of Travel (LOT) and walk sequencing of mailings. There is provision for storage of USPS raw data allowing LOT sequence to be validated in production. There is also a field that can contain information on the proper sort sequence to allow the mail pieces to be produced in the correct order. This may be helpful in reducing communication difficulties between mail preparers and mail producers. As long as the method of calculating a carrier sort sequence is defined in a standard and non-relative way, it will also allow adding records to the mailing after the original file has been created.

DEDUPLICATION

One major benefit from ADIS is the simplification of the process of deduplication of multiple address files, provided the files are provided in or converted to ADIS files sets, with enough correspondence in the fields utilized. This merge/purge technique is suitable for international as well as international files. It is efficient computationally to compare corresponding name and address elements directly to each other rather than parsing the data once again to set up the same comparisons.

SECONDARY DESIGNATORS AND NUMBERS

By including the missing secondary element indicator, ADIS supports a simpler method of exchange of apartment and suite numbers between parties. The USPS DSF can identify missing apartment and suite numbers but, lacking name data, cannot supply the missing numbers. Currently there are some limited capabilities in private industry to add apartment and suite numbers, but exchange of this data between parties is very rare. What makes this prospect enticing is that private files vary from 75% coverage down to 25% or lower on compiled lists. In other words, two-thirds of the problem of missing apartment and suite numbers can be defined as a problem of distribution of data, while one-third is caused by lack of availability of data. Since these missing numbers not only can cause delivery problems but

also cause less than optimal sorting of mail on postal equipment and lead to additional work by carriers, this is a more important issue than often realized.

MARKETING DATA

The use of specifically identified secondary designators and numbers is relevant for marketing purposes. For example, a mailer of seed packets would want to know who lived in high rise apartments as opposed to single family dwellings. ADIS provides the ability to tabulate an extensive list of secondary designators for both North America and Europe, and this list can easily be extended.

For determining the nearest service location to a mailing recipient, the latitude and longitude fields in ADIS allow for an efficient determination of the shortest distance. This can be used, for example, to image a road map on the mail piece showing directions between the location of the addressee and the location of the service provider.

"JUST-IN-TIME" PRESORT TRANSFORMATIONS

Late modifications to prepared mailings, including additions, deletions, and changes, can be accomplished, particularly if an address standard such as GCA ADIS is combined with a mailing database standard such as GCA Mail.dat to comprise a complete record of all data pertaining to a mailing. The additions, deletions, and changes could be made to the ADIS file, and the Mail.dat file could be incrementally modified, to remain consistent with the address data and fully compliant with postal regulations. For catalog mailers, there can be several hundred NCOA changes per million addresses per day that become available after the mailing has been prepared and before it is produced. For magazine mailers, there are new subscriptions and cancellations as well as address changes. The USPS PAVE department has already indicated its willingness to certify technology that performs this task, so long as the modified mailing conforms to the presort regulations just as the original mailing does when using PAVE certified software. The USPS recognizes that this technology would reduce mail forwarding costs and therefore would have value for the Postal Service as well as the mailers.

A sequence number for all records within the file is provided with a recommended major key of nine digits and a secondary key of three digits. This will allow up to a thousand records to be interposed within two records on the original file. If this is not enough, the major key can be limited to eight digits, and then up to ten thousand records could be interposed.

RESEQUENCING MAIL CONTAINERS

In order to support changes in entry points, ADIS includes the necessary information to redefine an entry point, for example, from the BMC level to the SCF level, without external lookups. In addition, mail containers can be resequenced to collect all the mail needed for a given truckload so that it can be produced in the most efficient manner. This prevents the need for producing mail containers that will not be needed yet to fulfill the distribution plan, instead allowing production of the mail containers that are next in line to leave the plant.

COST MATRIX

USPS cost data for Periodicals recently made available has been used by Peter Moore to show that mailings of Periodicals can in some cases use up to ten times as many containers, and incur three times as much postal cost, while saving less than one percent of the postage. This practice may continue for the reason that it may produce faster delivery for some of the mail pieces. However, the USPS may question whether this sort of ratio of cost to benefit is appropriate in the current environment, which requires vigilance with respect to postal costs. And mail producers have been investigating whether their costs increase in line with the increase in postal costs that has been shown to occur by just using variations in the allowed presort options. Therefore, the ability to reorganize mailings by reshuffling a Mail.dat file, which Peter Moore has demonstrated, can point to more efficient ways to presort future mailings. To further improve on this methodology, the ADIS format can be used to reshuffle mailings not only to gain insights for the future, but to fix inefficient presort outcomes before the mailings are produced at all. The combination of the ability to add and delete recipients, to reshuffle packages and containers, and to modify entry points has created an important new set of opportunities. By basing this on industry standards, the scope of these opportunities will be further expanded.

More recently, the industry associations PostCom and DMA have supported an effort by Project Performance Corporation to produce a cost matrix for Standard (A) mail similar to that published by the USPS in the rate case. The goal is to encourage the USPS to respond to the industry initiative and for this methodology to be institutionalized in future rate cases. This will make the technology described above applicable to multiple mail classes.

COMBINED MAILINGS

Building further on the technology needed to reorganize mailings, the use of ADIS will make it easier to combine multiple mailings into a larger mailing with better postage and delivery characteristics and reduced costs for both industry and USPS. An industry addressing standard would make it easier for more mailings to be combined closer to the actual point of production. This could take multiple forms, depending on the type of equipment available and the relative savings that can be attained. The alternatives range from package reallocation to piece level co-mailing to the creation of composite mail pieces, either firm bundles or packages of bound printed matter. Certainly there are issues that need to be resolved before applications of this type can be implemented, but the expected trend of increases in postal rates coupled with the impending availability of standardized formats for all mailing data places such developments squarely on the agenda for the future.

As an example, using the completeness indicator on high rise apartment addresses could help mailers distinguish accurately between residents of the same apartment building and residents of the same apartment. This would make it possible to create, for example, firm bundles of different magazines going to the same delivery point. Magazine publishers would not have been supportive of such an approach when the concern for postal costs and postal rates was less than it is currently. But now the opportunity to create a single mail piece out of multiple magazines going to the same delivery point would in some cases outweigh the concerns about commingling different products, even from different publishers. The physical form factors of the mail pieces would still have to approximately coincide for this to be practical. But GCA ADIS could offer assurance that what looks like the same delivery point is actually the same delivery point, thus removing a major barrier to this potential technological innovation.

INK JET

When creating ink jet tapes for mail producers, mail preparers often face difficulty in making sure that the proper specification is followed and that all the data is correctly formatted. Sometimes this process breaks down, either producing tapes that do not run, or in some cases tapes with defects, such as Line of Travel errors, that can result in postage penalties. At other times the mail producers want to run a job on multiple production lines to make up for delays, but the additional equipment requires a different format. For reasons such as these, if the mail preparers created the ADIS file either along with or instead of the ink jet tapes, there would be additional flexibility and new options for recovery.

The inspiration behind the original GCA ADIS format more than a decade ago was to avoid the need to create ink jet tapes at all. The idea was that the mail preparer could create the ADIS file and then the ink jet vendors would support reading any ADIS file to generate the particular ink jet format needed. Though several mail preparers did generate the ADIS files, the ink jet vendors did not import this format directly, and the ADIS file became much like any other presort output file format, requiring a further step to create the ink jet tapes. Clearly the same potential opportunity resurfaces with the second generation GCA ADIS format. In addition, the power of the rendition capability within the new ADIS allows for another possibility, namely that the ink jet format can be created directly within ADIS by rendition and without customized programming.

XI. FUTURE ENHANCEMENTS

A number of items considered for inclusion in ADIS have been set aside for implementation in future versions. Several of these items are of sufficient importance to warrant mention in this document. These include the following:

As soon as practicable, ADIS will be modified to include a data dictionary component that applies to each template. This has several purposes. It will make it easier to see which data elements are included in the template, and by inference, which are not included. It will allow for further information useful for quality to control to be associated with elements. For instance, elements could be described as required, or optional, or part of a group of which at least one element is required for a complete and correct address. The content of the element could be defined as numeric, alphabetic or alphanumeric, and later the content could be made to conform to a predefined schema or complex data type for which the acceptable values could be enumerated. This will work to ensure that addresses that are going to be used on a mail piece have the best possible chance for timely and efficient delivery.

A related issue is the further enhancement of the ADIS/XML format by using XML schemas. The current ADIS/XML DTD would be phased out as a result of this process. As of now, XML schemas do not yet have the full status of a World Wide Web Consortium (W3C) recommendation, though that is expected to be just a matter of time. The schemas would offer similar quality control benefits to the template element dictionaries, but could operate earlier in the address management process. One issue that would have to be resolved is that at an early stage in address management partially correct addresses may be acquired. This can be completely acceptable as long as processes are carried out to upgrade the data and to select

addresses for mailing with data quality considerations in mind. Therefore the schemas would have to be able to be deployed in a flexible manner to meet the differing requirements of the user at different stages of the address management process.

After experience is gained with rendition engines, a great increase in the power of these components will be attained when support for intermediate and nested rendition is added. Intermediate rendition refers to the development of complex elements that are the output of one process and potentially the input to another process. Nested rendition refers to the ability to route the output of one template to serve as the input to another template in a sequence of indefinite length. As is possible with XSLT, the ability to call templates recursively could be very useful. These features are not included in ADIS because of the need to understand and implement the basic requirements of rendition for address data elements first. It may be that the rendition instructions will need to be recast in a different form in order to facilitate the development of these advanced capabilities.

We are aware that the set of rendition instructions presented in this version of ADIS, including the template structure, commands, and functions, will need some further elaboration before it can be considered to fully meet user requirements. A simple example is that when two lines are combined, it is not straightforward in this version of ADIS to add a delimiter between them. For example, if it is desired to combine “John Doe” and “Mary Roe”, it would be helpful to be able to put “ and ” or “/” or “ & ” between the two names. In this version of ADIS, this could be done using embedded inserts in message data elements, as long as it is known that both of the names are populated. Otherwise it might require an externalized procedure using a user defined element, and therefore the dynamic capabilities of the rendition engine to prioritize commands and functions would not come into play. As a more difficult example, much work would need to be done to handle issues such as multiple fonts or variable line spacing. It is possible the users will not want to take ADIS in this direction, relying instead on many other tools that exist to handle tasks such as this.

One issue that will be taken up in order to increase the extent to which ADIS is easy to use for international mailings is to classify postal codes exhaustively so that complex data types can be developed for storing and imaging them. These complex data types could be country specific, but it seems advantageous not to have twenty different address data elements to define a four digit postal code just because there are twenty countries that utilize such a format. The intention is to research the postal codes currently used, relying on existing industry sources as well as forthcoming UPU data, and to make such classifications as are appropriate, with the goal of minimizing complexity while supporting improved data validation. By taking such steps as these, GCA ADIS will help contribute toward the development of an internationally recognized and widely utilized standard for domestic and international address management and mail production.

Rendition Group Detail Example 1 (US Address Label)

Primary Key		Template Number	Lne Nbr	Lne Pty	Lne Mrg	Lne Mrg Ordr	Lne Mrg Loc	Lne Seg	Line Cmp	Line Command /Insert	Adis Key	L/R Jsfy	Line Start Posn	Char Strng Lgth	Line Cmd Prty	Literal Input Example	Content Example/ (Comment)
0005298731		USEXILADR001	001	005	1	1	001			LITERAL		L	035	018		'YOUR ORDER CODE: '	
0005298731		USEXILADR001	001								A10.400	L	***	***			516-18 (promo key)
0005298731		USEXILADR001	002	010													(blank line)
0005298731		USEXILADR001	003	006						OVERLAY		L	040	030		ALL '*'	
0005298731		USEXILADR001	003								A10.540	R	069	***			*******3-DIGIT 123
0005298731		USEXILADR001	004	001	1	2					A70.090	L	040	***			125X (list code)
0005298731		USEXILADR001	004							LITERAL		L	046	017		'CUSTOMER NUMBER: '	
0005298731		USEXILADR001	004								A10.350	L	063	***			5487623
0005298731		USEXILADR001	005	004						INIT	A20.030	L	040	***	1		JOHN
0005298731		USEXILADR001	005							ELIM					2		
0005298731		USEXILADR001	005							INIT	A20.050	L	***	***	0		QUINCY
0005298731		USEXILADR001	005								A20.080	L	***	***			ADAMS
0005298731		USEXILADR001	005								A10.020	L	065	***			00125
0005298731		USEXILADR001	006	008					005	LITERAL		L	040	***		'OR CURRENT RESIDENT'	
0005298731		USEXILADR001	007	009					005	WRAPDN	A50.020	L	040	***	1		INTERNATIONAL CONSULTING SERVICES PROPRIETARY LIMITED
0005298731		USEXILADR001	007							ABBREV					2		
0005298731		USEXILADR001	008	002				2	005		A30.020	L	040	***			123
0005298731		USEXILADR001	008					2		ABBREV	A30.030	L	***	***	1		NORTH
0005298731		USEXILADR001	008					2			A30.040	L	***	***			
0005298731		USEXILADR001	008					2		REDUCE	A30.050	L	***	***	3		MAIN
0005298731		USEXILADR001	008					2		ABBREV	A30.060	L	***	***	2		AVENUE
0005298731		USEXILADR001	008					2			A30.070	L	***	***			
0005298731		USEXILADR001	008					1		WRAPUP	A30.080	L	***	***	1		SUITE
0005298731		USEXILADR001	008							ABBREV					2		
0005298731		USEXILADR001	008					1			A30.090	L	***	***			5A
0005298731		USEXILADR001	009	003							A40.040	L	040	***			ANYCITY
0005298731		USEXILADR001	009								A40.060	L	***	***			ST
0005298731		USEXILADR001	009								A10.170	L	***	***			12345
0005298731		USEXILADR001	009							CONCAT		L	***	***		'-'	(hyphen only if z4 found)
0005298731		USEXILADR001	009								A10.180	L	***	***			6789
0005298731		USEXILADR001	010	011													(blank line)
0005298731		USEXILADR001	011	007						LITERAL		L	050	022		'IN HOME: Aug 29-Aug 31'	(in-home date)

```
Output Label: Line 1:     YOUR ORDER CODE:  516-18
(IF 10 LINES) Line 2:          ******************3 DIGIT 123
              Line 3:          125X  CUSTOMER NUMBER: 5487623
              Line 4:          JOHN Q ADAMS              00125
              Line 5:          OR CURRENT RESIDENT
              Line 6:          INTERNATIONAL CONSULTING
              Line 7:          SERVICES PROPRIETARY LIMITED
              Line 8:          123 N MAIN AVENUE SUITE 5A
              Line 9:          ANYCITY ST 12345-6789
              Line10:                    IN HOME: AUG 29-AUG 31
```

```
Output Label: Line 1:     YOUR ORDER CODE:  516-18
(IF 8 LINES)  Line 2:          ******************3 DIGIT 123
              Line 3:          125X  CUSTOMER NUMBER: 5487623
              Line 4:          JOHN Q ADAMS              00125
              Line 5:          OR CURRENT RESIDENT
              Line 6:          123 N MAIN AVENUE SUITE 5A
              Line 7:          ANYCITY ST 12345-6789
              Line 8:                    IN HOME: AUG 29-AUG 31
```

Rendition Group Detail Example 2 (US Address Label)

Primary Key		Template Number	Lne Nbr	Lne Pty	Lne Mrg	Lne Mrg Ordr	Lne Mrg Loc	Lne Seg	Line Cmp	Line Command /Insert	Adis Key	L/R Jsfy	Line Start Posn	Char Strng Lgth	Line Cmd Prty	Literal Input Example	Content Example/ (Comment)
0005298731		USEXILADR002	001	001						OVERLAY		L	001	040		ALL '*'	
0005298731		USEXILADR002	001								A10.540	R	040	***			*******ADC 07099
0005298731		USEXILADR002	002	002						LITERAL		L	001	016		'ACCOUNT NUMBER: '	
0005298731		USEXILADR002	002								A10.350	L	017	***			5328901
0005298731		USEXILADR002	002							LITERAL		L	028	008		'SACK #: '	
0005298731		USEXILADR002	002								A10.070	L	036	***			00084 (Last 5 DIGITS of Sack)
0005298731		USEXILADR002	003	003						INIT	A20.030	L	001	***	1		JAMES
0005298731		USEXILADR002	003							ELIM					2		
0005298731		USEXILADR002	003							INIT	A20.050	L	***	***	0		
0005298731		USEXILADR002	003								A20.080	L	***	***			WILLIAMS
0005298731		USEXILADR002	004	009	1	1	004				A50.010	L	001	***			STAFF MANAGER
0005298731		USEXILADR002	005	008	1	2				WRAPDN	A50.020	L	001	***	0		INTERNATIONAL AMALGAMATED INDUSTRIES LTD
0005298731		USEXILADR002	005							ABBREV					2		
0005298731		USEXILADR002	006	004				2	003		A30.020	L	001	***			955
0005298731		USEXILADR002	006					2		INIT	A30.030	L	***	***	1		
0005298731		USEXILADR002	006					2		ABBREV	A30.040	L	***	***			
0005298731		USEXILADR002	006					2		REDUCE	A30.050	L	***	***	3		SPRINGFIELD
0005298731		USEXILADR002	006					2		ABBREV	A30.060	L	***	***	2		BOULEVARD
0005298731		USEXILADR002	006					2		INIT	A30.070	L	***	***			WEST
0005298731		USEXILADR002	006					1		WRAPUP	A30.080	L	***	***	1		APARTMENT
0005298731		USEXILADR002	006					1		ABBREV					2		
0005298731		USEXILADR002	006					1			A30.090	L	***	***			1385
0005298731		USEXILADR002	007	005							A40.040	L	001	***			CHICAGO
0005298731		USEXILADR002	007								A40.060	L	***	***			IL
0005298731		USEXILADR002	007								A10.170	L	***	***			60601
0005298731		USEXILADR002	007							CONCAT		L	***	***		'-'	(hyphen only if z4 found)
0005298731		USEXILADR002	007								A10.180	L	***	***			
0005298731		USEXILADR002	008	007													
0005298731		USEXILADR002	009	006						LITERAL		L	021	020		'SPECIAL OFFER INSIDE'	

```
Output Label: Line 1:    ****************************** ADC 07099
(IF 10 LINES) Line 2:    ACCOUNT NUMBER: 5328901    SACK #: 00084
              Line 3:    JAMES WILLIAMS
              Line 4:    STAFF MANAGER
              Line 5:    INTERNATIONAL AMALGAMATED INDUSTRIES LTD
              Line 6:    APARTMENT 1385
              Line 7:    955 SPRINGFIELD BOULEVARD W
              Line 8:    CHICAGO IL 60601
              Line 9:
              Line10:                       SPECIAL OFFER INSIDE
```

```
Output Label: Line 1:    ****************************** ADC 07099
(IF 8 LINES)  Line 2:    ACCOUNT NUMBER: 5328901    SACK #: 00084
              Line 3:    JAMES WILLIAMS
              Line 4:    APARTMENT 1385
              Line 5:    955 SPRINGFIELD BOULEVARD W
              Line 6:    CHICAGO IL 60601
              Line 7:
              Line 8:                       SPECIAL OFFER INSIDE
```

Rendition Group Detail Example 3 (Simple Message – One Embedded Insert)

Primary Key		Template Number	Lne Nbr	Lne Pty	Lne Mrg	Lne Mrg Ordr	Lne Mrg Loc	Lne Seg	Line Cmp	Line Command /Insert	Adis Key	L/R Jsfy	Line Start Posn	Char Strng Lgth	Line Cmd Prty	Content of Message Text From .mgd
0005298731		USEXILMSG001	001								M01.001	L	001	025		DEAR)(A20.030),
0005298731		USEXILMSG001	002								M02.001	L	001	025		
0005298731		USEXILMSG001	003								M03.001	L	001	025		SUMMER'S JUST AROUND THE
0005298731		USEXILMSG001	004								M04.001	L	001	025		CORNER! TREAT YOURSELF TO
0005298731		USEXILMSG001	005								M05.001	L	001	025		A BRIGHT NEW LOOK. SEE
0005298731		USEXILMSG001	006								M06.001	L	001	025		PAGES 22, 62 AND 70.

```
Output Message: Line 1:     DEAR NORMAN,
                Line 2:
                Line 3:     SUMMER'S JUST AROUND THE
                Line 4:     CORNER! TREAT YOURSELF TO
                Line 5:     A BRIGHT NEW LOOK. SEE
                Line 6:     PAGES 22, 62 AND 70.
```

Rendition Group Detail Example 4 (Canadian Address Label)

Primary Key		Template Number	Lne Nbr	Lne Pty	Lne Mrg	Lne Mrg Ordr	Lne Mrg Loc	Lne Seg	Line Cmp	Line Command /Insert	Adis Key	L/R Jsfy	Line Start Posn	Char Strng Lgth	Line Cmd Prty	Literal Input Example	Content Example/ (Comment)
0005298731		USEXILADR002	001	007						LITERAL		L	001	012		'ORDER CODE: '	
0005298731		USEXILADR002	001								A10.400	L	***	***			925786 (offer code)
0005298731		USEXILADR002	002	009													(blank line)
0005298731		USEXILADR002	003	006						LITERAL		L	001	015		'FINDER NUMBER: '	
0005298731		USEXILADR002	003								A10.350	L	***	***			32469843
0005298731		USEXILADR002	004	008													(blank line)
0005298731		USEXILADR002	005	004						INIT	A20.040 A20.030	L	001	***	1		PHIL PHILIP
0005298731		USEXILADR002	005	005						ELIM					2		
0005298731		USEXILADR002	005							INIT	A20.050	L	***	***	0		JAMES
0005298731		USEXILADR002	005								A20.080	L	***	***			RHUBARB
0005298731		USEXILADR002	006	001					005		A30.020	L	001	***			475
0005298731		USEXILADR002	006							ABBREV	A30.030	L	***	***	1		EAST
0005298731		USEXILADR002	006								A30.040	L	***	***			
0005298731		USEXILADR002	006							REDUCE	A30.050	L	***	***	3		VICTORIA
0005298731		USEXILADR002	006							ABBREV	A30.060	L	***	***	2		STREET
0005298731		USEXILADR002	006								A30.070	L	***	***			
0005298731		USEXILADR002	006								A10.570	R	***	***			M
0005298731		USEXILADR002	007	002						ABBREV	A30.080	L	001	***	1		APARTMENT
0005298731		USEXILADR002	007								A30.090	L	***	***			1501
0005298731		USEXILADR002	007								A10.560	R	***	***			H 12
0005298731		USEXILADR002	008	003							A40.040	L	001	***			AMHERST
0005298731		USEXILADR002	008								A40.060	L	***	***			NF
0005298731		USEXILADR002	008								A10.550	L	***	***			A1B 4M2
0005298731		USEXILADR002	009	004							A40.080	L	001	***			CANADA

```
Output Label: Line 1:          ORDER CODE: 925786
              Line 2:          FINDER NUMBER: 32469843
              Line 3:
              Line 4:          PHIL J RHUBARB
              Line 5:          475 EAST VICTORIA STREET     M
              Line 6:          APARTMENT 1501            H 12
              Line 7:          AMHERST NF A1B 4M2
              Line 8:          CANADA
```

Rendition Group Detail Example 5 (Message – Multiple Variables and Rendition Commands)

Primary Key		Template Number	Lne Nbr	Lne Pty	Lne Mrg	Lne Mrg Ordr	Lne Mrg Loc	Lne Seg	Line Cmp	Line Command	Adis Key	L/R Jsfy	Line Start Posn	Char Strng Lgth	Line Cmd Prty	Contents of Message Text From .mgd/ Null Literal For CONCAT command
0005298731		USEXILMSG001	001	003							M01.002	L	001	040		GREETINGS
0005298731		USEXILMSG001	001								A20.030	L	***	***		
0005298731		USEXILMSG001	001							CONCAT		L	***	***		‘’
0005298731		USEXILMSG001	001								M02.002	L	***	***		,
0005298731		USEXILMSG001	003	001						WRAPDN	M03.002	L	001	040		CHRISTMAS IS JUST AROUND THE
0005298731		USEXILMSG001	003													CORNER! TREAT YOURSELF TO
0005298731		USEXILMSG001	003													A PREVIEW OF OUR EARLY SEASON
0005298731		USEXILMSG001	003													CATALOG. SEE PAGE 52 FOR A SPECIAL
0005298731		USEXILMSG001	003													OFFER AVAILABLE ONLY TO THOSE IN
0005298731		USEXILMSG001	003													THE
0005298731		USEXILMSG001	003								A70.230	L	***	***		
0005298731		USEXILMSG001	003								M04.002	L	***	***		COUNTY AREA.
0005298731		USEXILMSG001	004	002							M05.002	L	001	040		CALL NOW TO PLACE YOUR ORDER.
0005298731		USEXILMSG001	005	004							M06.002	L	001	040		DON’T DELAY SUPPLIES ARE LIMITED.

```
Output Message: Line 1:     GREETINGS FERNANDO,
(IF 8 LINES)    Line 2:
                Line 3:     CHRISTMAS IS JUST AROUND THE CORNER!
                Line 4:     TREAT YOURSELF TO A PREVIEW OF OUR EARLY
                Line 5:     SEASON CATALOG.  SEE PAGE 52 FOR A SPECIAL
                Line 6:     OFFER AVAILABLE ONLY TO THOSE IN THE
                Line 7:     CHESAPEAKE COUNTY AREA.
                Line 8:     CALL NOW TO PLACE YOUR ORDER.
```

ADIS/XML SAMPLE DATA SET

```
<?xml version="1.0"?>
<!-- edited with XML Spy v3.0.6 (http://www.xmlspy.com) by Joe Lubenow (Experian) -->
<!DOCTYPE adis.xml SYSTEM "adis.dtd">
<adis.xml>
    <header>
        <primary.key>0000012345</primary.key>
        <version>01-1</version>
        <job.num/>
        <job.name/>
        <source/>
        <user.code>GCA</user.code>
        <contact.name>Georgia Volakis</contact.name>
        <contact.phone>703-519-8172</contact.phone>
    </header>
    <group.header>
        <group.id>001</group.id>
        <group.name>Domestic</group.name>
    </group.header>
    <detail>
        <keys>
            <sequence.num>000000001000</sequence.num>
            <customer.num/>
            <template>
                <iso.country.code>US</iso.country.code>
            </template>
        </keys>
        <address>
            <name>
                <parsedname>
                    <pre.honorific>Mr.</pre.honorific>
                    <first preferred="Nicky">Nigel</first>
                    <middle>George</middle>
                    <last>Everett</last>
                    <suffix>Jr</suffix>
                </parsedname>
            </name>
            <name>
                <parsedname>
                    <pre.honorific>Mrs.</pre.honorific>
                    <first preferred="Buffy">Elizabeth</first>
                    <middle>Jane</middle>
                    <last>Everett</last>
                    <post.honorific>PhD</post.honorific>
                </parsedname>
            </name>
            <street>
                <parsedstreet>
                    <primary.num>104</primary.num>
                    <pre.dir>North</pre.dir>
                    <street.name>Main</street.name>
                    <post.type>Street</post.type>
                    <sec1.type>Apartment</sec1.type>
                    <sec1.num>302</sec1.num>
                </parsedstreet>
            </street>
            <last.line.data>
                <parsed.last.line>
                    <city>Chicago</city>
```

```
                <state.prov state.prov.abbr="IL">Illinois</state.prov>
                <post.code.display>60607-1419</post.code.display>
            </parsed.last.line>
        </last.line.data>
    </address>
    <keys>
        <sequence.num>000000002000</sequence.num>
        <customer.num/>
        <template>
            <iso.country.code>US</iso.country.code>
        </template>
    </keys>
    <address>
        <name>
            <unparsedname>Mr N G Everett Jr</unparsedname>
        </name>
        <street>
            <parsedstreet>
                <primary.num>545</primary.num>
                <pre.dir>North</pre.dir>
                <pre.type>Avenue</pre.type>
                <street.name>Of The Americas</street.name>
                <post.type/>
            </parsedstreet>
        </street>
        <last.line.data>
            <parsed.last.line>
                <city>Chicago</city>
                <state.prov state.prov.abbr="IL">Illinois</state.prov>
                <post.code.display>60607</post.code.display>
            </parsed.last.line>
        </last.line.data>
    </address>
    <keys>
        <sequence.num>000000003000</sequence.num>
        <customer.num/>
        <template>
            <iso.country.code>US</iso.country.code>
        </template>
    </keys>
    <address>
        <name>
            <unparsedname>Noel Pascal Wickham</unparsedname>
        </name>
        <street>
            <unparsedstreet>4800 Sheridan Road North</unparsedstreet>
        </street>
        <last.line.data>
            <unparsed.last.line>Milwaukee WI 53207</unparsed.last.line>
            <receiving.country.name>USA</receiving.country.name>
        </last.line.data>
    </address>
    <keys>
        <sequence.num>000000004000</sequence.num>
        <customer.num/>
        <template>
            <iso.country.code>US</iso.country.code>
        </template>
    </keys>
    <address>
        <name>
            <parsedname>
                <first preferred="Jim"/>
                <middle/>
```

```
            <last>Davis</last>
        </parsedname>
    </name>
    <street>
        <parsedstreet>
            <primary.num>4437</primary.num>
            <pre.dir>North</pre.dir>
            <street.name>Mozart</street.name>
            <post.type>Avenue</post.type>
        </parsedstreet>
    </street>
    <last.line.data>
        <dependent.locality>Albany Park</dependent.locality>
        <locality>Ravenswood</locality>
        <parsed.last.line>
            <city>Chicago</city>
            <state.prov>Illinois</state.prov>
            <post. 0
```

```
    </detail>
    <group.header>
        <group.id>002</group.id>
        <group.name>Canada</group.name>
    </group.header>
    <detail>
        <keys>
            <sequence.num>000000001000</sequence.num>
            <template>
                <iso.country.code>CN</iso.country.code>
            </template>
        </keys>
        <address>
            <name>
                <parsedname>
                    <first>Fred</first>
                    <last>Jones</last>
                </parsedname>
            </name>
            <street>
                <unparsedstreet>142 Maple Drive</unparsedstreet>
            </street>
            <last.line.data>
                <unparsed.last.line>Toronto ON A1B 4D1</unparsed.last.line>
                <receiving.country.name>Canada</receiving.country.name>
            </last.line.data>
        </address>
        <mailing.data>
            <message.data>
                <mlc.nnn msgnum="001">004></mlc.nnn>
                <mtm.nnn msgnum="001" >015></mtm.nnn>
                <mgr.nnn> msgnum="001">Canada</mgr.nnn>
            </message.data>
        </mailing.data>
        </detail>
</adis.xml>
```

XSLT PROCEDURE TO IMPLEMENT GCA ADIS “REDUCE” COMMAND

```
<?xml version="1.0" encoding="UTF-8"?>
<xsl:transform version="1.0" xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
xmlns:fo="http://www.w3.org/1999/XSL/Format">

<xsl:strip-space elements="file"/>

<xsl:template name="do-reverse">
<xsl:param name="length" />
<xsl:param name="text" />
<xsl:choose>
<xsl:when test="$length &gt; 0">
    <xsl:value-of select = "substring($text,$length,1)"/>
    <xsl:call-template name="do-reverse">
        <xsl:with-param name="length" select = "$length - 1"/>
        <xsl:with-param name="text" select = "$text"/>
    </xsl:call-template>
</xsl:when>
<xsl:otherwise>
<xsl:message>Done</xsl:message>
</xsl:otherwise>
</xsl:choose>
</xsl:template>

<xsl:template name="do-reduce">
<xsl:param name="length"/>
<xsl:param name="input" />
<xsl:param name="start" />
<xsl:choose>
<xsl:when test="$start &lt;= ($length)">
    <xsl:if test="(substring($input,$start,1) = 'a')  or
        (substring($input,$start,1) = 'e') or
        (substring($input,$start,1) = 'i') or
        (substring($input,$start,1) = 'o') or
        (substring($input,$start,1) = 'u') or
        (substring($input,$start,1) = 'A') or
        (substring($input,$start,1) = 'E') or
        (substring($input,$start,1) = 'I') or
        (substring($input,$start,1) = 'O') or
        (substring($input,$start,1) = 'U')">
        <xsl:value-of select = "'9'"/></xsl:if>
    <xsl:if test="substring($input,$start,1)=' '"><xsl:value-of select = "'1'"/>   </xsl:if>
    <xsl:call-template name="do-reduce">
        <xsl:with-param name="length" select = "$length"/>
        <xsl:with-param name="input" select = "$input"/>
        <xsl:with-param name="start" select = "$start + 1"/>
    </xsl:call-template>
</xsl:when>
<xsl:otherwise>
    <xsl:value-of select = "'1'"/>
</xsl:otherwise>
</xsl:choose>
</xsl:template>

<xsl:template name="do-revise">
<xsl:param name="length"/>
<xsl:param name="input" />
<xsl:param name="start" />
<xsl:choose>
<xsl:when test="$start &lt;= ($length)">
    <xsl:if test="(substring($input,$start,1)='9') and (substring($input,$start+1,1)='9')">
        <xsl:value-of select="'Y'"/>
    </xsl:if>
```

```
    <xsl:if test="(substring($input,$start,1)='9') and (substring($input,$start+1,1)='1')">
        <xsl:value-of select="'N'"/>
    </xsl:if>
    <xsl:call-template name="do-revise">
        <xsl:with-param name="length" select = "$length"/>
        <xsl:with-param name="input" select = "$input"/>
        <xsl:with-param name="start" select = "$start + 1"/>
    </xsl:call-template>
</xsl:when>
<xsl:otherwise>
    <xsl:message>Finished</xsl:message>
</xsl:otherwise>
</xsl:choose>
</xsl:template>

<xsl:template name="do-process">
<xsl:param name="start"/>
<xsl:param name="length"/>
<xsl:param name="input"/>
<xsl:param name="pattern"/>

<xsl:choose>
<xsl:when test="$start &lt;= ($length)">
    <xsl:choose>
        <xsl:when test="((substring($input,$start,1) = 'a')  or
            (substring($input,$start,1) = 'e') or
            (substring($input,$start,1) = 'i') or
            (substring($input,$start,1) = 'o') or
            (substring($input,$start,1) = 'u') or
            (substring($input,$start,1) = 'A') or
            (substring($input,$start,1) = 'E') or
            (substring($input,$start,1) = 'I') or
            (substring($input,$start,1) = 'O') or
            (substring($input,$start,1) = 'U')) and
            (substring($pattern,1,1) = 'Y')">
            <xsl:call-template name="do-process">
                <xsl:with-param name="start" select="$start + 1"/>
                <xsl:with-param name="length" select="$length"/>
                <xsl:with-param name="input" select="$input"/>
                <xsl:with-param name="pattern" select="substring-after($pattern,'Y')"/>
            </xsl:call-template>
        </xsl:when>
        <xsl:when test="((substring($input,$start,1) = 'a')  or
            (substring($input,$start,1) = 'e') or
            (substring($input,$start,1) = 'i') or
            (substring($input,$start,1) = 'o') or
            (substring($input,$start,1) = 'u') or
            (substring($input,$start,1) = 'A') or
            (substring($input,$start,1) = 'E') or
            (substring($input,$start,1) = 'I') or
            (substring($input,$start,1) = 'O') or
            (substring($input,$start,1) = 'U')) and
            (substring($pattern,1,1) = 'N')">
            <xsl:value-of select="substring($input,$start,1)"/>
            <xsl:call-template name="do-process">
                <xsl:with-param name="start" select="$start + 1"/>
                <xsl:with-param name="length" select="$length"/>
                <xsl:with-param name="input" select="$input"/>
                <xsl:with-param name="pattern" select="substring-after($pattern,'N')"/>
            </xsl:call-template>
        </xsl:when>
        <xsl:otherwise>
            <xsl:value-of select="substring($input,$start,1)"/>
            <xsl:call-template name="do-process">
                <xsl:with-param name="start" select="$start + 1"/>
                <xsl:with-param name="length" select="$length"/>
```



```
                    <xsl:with-param name="input" select="$input"/>
                    <xsl:with-param name="pattern" select="$pattern"/>
                </xsl:call-template>
            </xsl:otherwise>
        </xsl:choose>
    </xsl:when>
    <xsl:otherwise>
        <xsl:message>Completed</xsl:message>
    </xsl:otherwise>
    </xsl:choose>

    </xsl:template>


    <xsl:template match="*">
    <xsl:copy>
    <xsl:copy-of select="@*" />
    <xsl:apply-templates />
    </xsl:copy>
    </xsl:template>

    <xsl:template match="text()">

    <xsl:variable name="candidate" select = "."/>
    <xsl:value-of select=" ' Candidate:' "/>
    <xsl:value-of select="$candidate"/>
    <xsl:value-of select="string-length($candidate)"/>

    <xsl:variable name="result">
        <xsl:call-template name="do-reverse">
            <xsl:with-param name="length" select="string-length($candidate)"/>
            <xsl:with-param name="text" select="." />
        </xsl:call-template>
    </xsl:variable>

    <xsl:value-of select=" ' Result:' "/>
    <xsl:value-of select="$result"/>
    <xsl:value-of select="string-length($result)"/>

    <xsl:variable name="reduce">
        <xsl:call-template name="do-reduce">
            <xsl:with-param name="length" select="string-length($result)"/>
            <xsl:with-param name="input" select="$result"/>
            <xsl:with-param name="start">1</xsl:with-param>
        </xsl:call-template>
    </xsl:variable>

    <xsl:value-of select=" ' Reduce:' "/>
    <xsl:value-of select="$reduce"/>
    <xsl:value-of select="string-length($reduce)"/>

    <xsl:variable name="revise">
        <xsl:call-template name="do-revise">
            <xsl:with-param name="length" select="string-length($reduce)"/>
            <xsl:with-param name="input" select="$reduce"/>
            <xsl:with-param name="start">1</xsl:with-param>
        </xsl:call-template>
    </xsl:variable>

    <xsl:value-of select=" ' Revise:' "/>
    <xsl:value-of select="$revise"/>
    <xsl:value-of select="string-length($revise)"/>

    <xsl:variable name="process">
        <xsl:call-template name="do-process">
            <xsl:with-param name="start">1</xsl:with-param>
```

```
            <xsl:with-param name="length" select="string-length($result)"/>
            <xsl:with-param name="input" select="$result"/>
            <xsl:with-param name="pattern" select="$revise"/>
        </xsl:call-template>
    </xsl:variable>

    <xsl:value-of select=" ' Process:' "/>
    <xsl:value-of select="$process"/>
    <xsl:value-of select="string-length($process)"/>

    <xsl:variable name="output">
        <xsl:call-template name="do-reverse">
            <xsl:with-param name="length" select="string-length($process)"/>
            <xsl:with-param name="text" select="$process"/>
        </xsl:call-template>
    </xsl:variable>

    <xsl:value-of select=" ' Output:' "/>
    <xsl:value-of select="$output"/>
    <xsl:value-of select="string-length($output)"/>

    </xsl:template>

    </xsl:transform>
```

EXAMPLES OF XSLT STRING PROCESSING OUTPUT

This shows the elimination of vowels other than the first vowel in any word.
Note: Not all intermediate results are displayed.

Candidate: Mount Olive 11
Output: Mont Olv 8

Candidate: Antelope Valley 15
Output: Antlp Vally 11

Candidate: Milwaukee 9
Output: Milwk 5

Candidate: Evanston Illinois 17
Output: Evnstn Illns 12

ADDRESS ELEMENTS DEFINED BY CEN NOT NOW INCLUDED IN GCA ADIS

Of thirty-five address elements defined by CEN as of the CEN TC 331 document WI 015 dated 2000-12-04, twenty-four are included in ADIS and cross-referenced to the CEN nomenclature. The remaining eleven elements are as follows:

4.3.1 addressee role descriptor
4.3.5 defining authority
4.3.6 delivery service indicator
4.3.7 delivery service number
4.3.8 delivery service qualifier
4.3.11 extension designation
4.3.15 given name
4.3.17 mailee role descriptor
4.3.20 organisational unit
4.3.27 supplementary dispatch data
4.3.30 thoroughfare access data

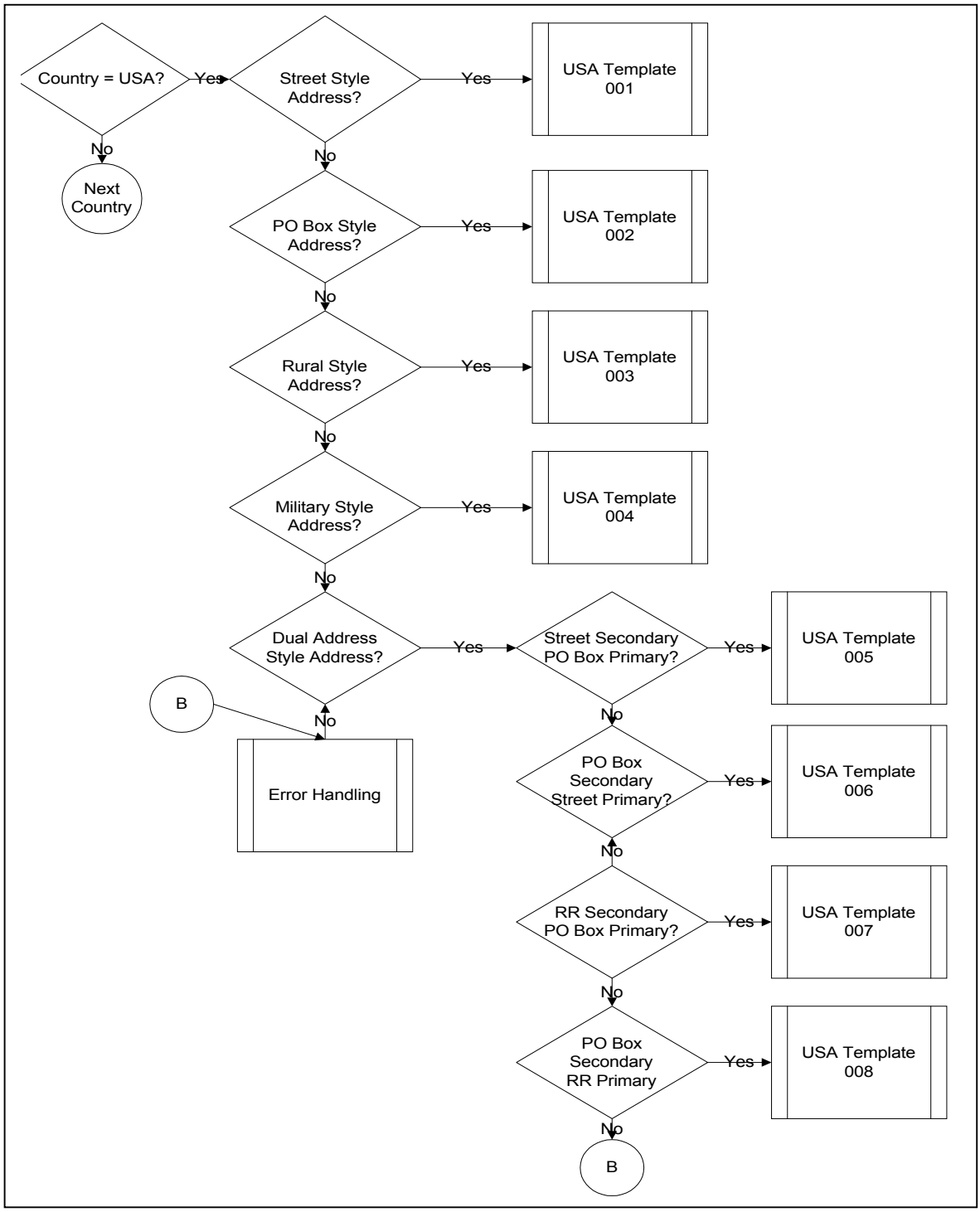
ADDRESS ELEMENTS DEFINED BY PROLST NOT NOW INCLUDED IN GCA ADIS

As of April 2001, ECCMA has defined one hundred and thirty-one address elements, plus another eight that are pending, for a total of 139. Of these, ADIS includes 103. The remaining thirty-six are as follows:

E10.003	House name
E10.004	Stairwell number
E12.001	Alternate telephone
E12.002	Beeper number
E12.003	Wireless phone
E12.005	Telephone extension
E12.006	Fax number
E12.007	Home fax number
E12.008	Home phone number
E12.009	Night telephone
E12.010	Other residential facsimile number
E12.011	Other residential telephone number
E12.012	Appointment phone
E12.013	Personal wireless phone number
E12.015	Telemail
E12.016	Universal resource locator (URL)
E12.017	Voice mail
E12.018	Work wireless telephone number
E12.019	Work fax number
E12.020	Work phone number
E13.005	Product group
E13.006	Sample number
E13.007	Sort and segregate
E13.009	Buyer identification
E13.010	Geographic score
E13.013	Do not mail
E13.014	Do not rent or exchange
E13.015	Street number low
E13.016	Street number high
E13.019	Sub template number
E13.034	Source of national change of address (NCOA)
E13.035	National change of address (NCOA) type
E13.041	Address completeness date
E13.045	Seasonality date
E13.048	Vacancy date
E13.051	Source of code table

UN/PROLST Format and Code Examples

In the United States, there are eight basic address formats the following diagram illustrates the formats from most common to least common.



The Use of Elements and Templates to Format Addresses

The templates that are used on the following pages do not include the lines for the POSTNET barcode, the ACS Key line, or the Optional Endorsement Line. These options are sufficiently complicated to require separate documentation, which can be found in the USPS Publication 25, *Designing Letter and Reply Mail.*

The elements used in the following templates have been broken down to the finest unit of an address component. This process can be done manually but is facilitated by the use of address matching software available in the U.S., Canada and some other countries of the world.

The templates are a vertical-line and horizontal-field oriented representation of how to rebuild properly formatted addresses using the address elements. When viewing the examples one will notice that there are some literals specified in quotes. These literals indicate a value that should be inserted at the specified location.

Potentially, each country will have several types of address structures that will require multiple templates for a given country. However, it is more likely that we will find that many countries have similar addressing requirements and the number of address structures will actually be substantially less than the total number of countries represented. In the United States, the basic format for addresses varies only slightly concerning the formatting of the address elements for Street Address 1 and Street Address 2 in the templates.

The secondary street address field, Street Address 2, which is positioned above the primary address line, Street Address 1, is used primarily as an area to handle address line overflow (see Rendition Instructions). Whenever possible street address line elements should use a single line. Street Address 2 is also used in the examples of Dual Addresses.

Dual addressing is a technique used by some mailers to specify an alternate delivery address. The problem with this technique is that in many cases the primary (Street Address 1) and secondary (Street Address 2) address lines are not within the same ZIP (Post) Code. In some cases, the primary and secondary addresses may not even be in the same city. To aid in rebuilding dual addresses we have created an indicator (Dual address preference - tag 13.032) that identifies which address line was used to obtain the ZIP (Post) Code. The identified address line must be used as the primary address line.

Not all of the format elements will be required for all street addresses but when present they should be presented in the order specified in the templates (see Rendition Instructions for the handling of address overflow). In the following template, the highlighted elements are utilized in the examples that follow.

The current tables for address elements and templates may be viewed from the ECCMA Web page:
http://www.eccma.org/iaec/

USA TEMPLATE 001 - Street Style Address

The street style address is the most common address format in the United States. This format is used for addresses with street names (tag 10.009) and no dual address preference (tag 13.032) is specified or the dual address preference specified is "S".

FIELDS	CONTAIN
Mailstop	**10.008**
Mailee	10.yyy
Primary Name	**11.002, 11.003, 11.004, 11.005, 11.006, 11.008, 11.007**
Title	**11.011**
Secondary Name	11.012, 11.013, 11.014, 11.015, 11.016, 11.018, 11.017
Department/Division	10.006, **10.007**
Organization	**11.001**
Urbanization	10.013
Street Address 2	
Street Address 1	**10.002**, 10.xxx, **10.009**, **10.010**, 10.011, **10.012, 10.013**
City/State/ZIP	**10.018, 10.020, 10.025, "-", 10.026**

MS 454
MR ED J L FLOWERS III ESQ
ATTORNEY AT LAW
MAIL FRAUD DIVISION
INSPECTION SERVICE
436 7TH AVE STE 454
PITTSBURGH PA 15220-1818

FIELDS	CONTAIN
Mailstop	10.008
Mailee	**10.yyy**
Primary Name	**11.002, 11.003, 11.004,** 11.005**, 11.006,** 11.008, 11.007
Title	11.011
Secondary Name	11.012, 11.013, 11.014, 11.015, 11.016, 11.018, 11.017
Department/Division	10.006, 10.007
Organization	11.001
Urbanization	10.013
Street Address 2	
Street Address 1	**10.002**, 10.xxx, **10.009**, **10.010**, 10.011, **10.012, 10.013**
City/State/ZIP	**10.018, 10.020, 10.025, "-", 10.026**

C/O MRS GWENDOLYN FOSTER
MISS EDWINA LEE FLOWERS
12345 HAIGHT CT APT 2
CHICAGO IL 60612-1012

USA TEMPLATE 001 - Street Style Address Continued

FIELDS	CONTAIN
Mailstop	10.008
Mailee	10.yyy
Primary Name	**11.002, 11.003,** 11.004**,** 11.005**, 11.006**, 11.008, 11.007
Title	11.011
Secondary Name	**11.012**, **11.013**, 11.014, 11.015, **11.016**, 11.018, 11.017
Department/Division	10.006, 10.007
Organization	11.001
Urbanization	10.013
Street Address 2	
Street Address 1	**10.002**, 10.xxx, **10.009**, **10.010**, 10.011, 10.012, 10.013
City/State/ZIP	**10.018, 10.020, 10.025, "-", 10.026**

MR IVAN KENT
MRS IMA KENT
121 1/2 SADDLE CIR HIGHLAN
PARK IL 60712-1012

FIELDS	CONTAIN
Mailstop	**10.008**
Mailee	10.yyy
Primary Name	**11.002**, **11.003**, 11.004, 11.005, **11.006**, 11.008, 11.007
Title	**11.011**
Secondary Name	11.012, 11.013, 11.014, 11.015, 11.016, 11.018, 11.017
Department/Division	**10.006**, 10.007
Organization	**11.001**
Urbanization	**10.013**
Street Address 2	
Street Address 1	**10.002**, 10.xxx, **10.009**, 10.010, 10.011, 10.012, 10.013
City/State/ZIP	**10.018, 10.020, 10.025, "-", 10.026**

MS-454
SR JUAN VALDEZ
BANK MANAGER
INVESTMENT DEPT
BANK OF SAN JUAN
URB ROOSEVELT
508 CALLE OCTAVIO MARCANO
SAN JUAN PR 00918-2749

USA TEMPLATE 002 - PO BOX Style Address

The PO Box Style Address is the second most common address format used in the United States. The PO Box Style Address format is indicated when a post office box number (tag 10.015) occurs and no dual address preference (tag 13.032) is specified or the dual address preference specified is “P".

FIELDS	**CONTAIN**
Mailstop	**10.008**
Mailee	10.yyy
Primary Name	**11.002**, **11.003**, 11.004, 11.005, **11.006**, 11.008, **11.007**
Title	**11.011**
Secondary Name	11.012, 11.013, 11.014, 11.015, 11.016, 11.018, 11.017
Department/Division	**10.006**, 10.007
Organization	**11.001**
Urbanization	10.013
Street Address 2	
Street Address 1	"PO BOX", **10.015**
City/State/ZIP	**10.018, 10.020, 10.025,** "-", **10.026**

MS-101
DR LILLIAN HERMAN MD
CHIEF OF STAFF
PULMONARY MEDICINE DEPT
NORTHWEST HOSPITAL
PO BOX 111
AMARILLO TX 79175-0001

USA TEMPLATE 003 - Rural Route Style Address

The Rural Route Style Address is the third most common address format used in the United States. Rural Route style addresses are still relatively common in rural areas of the United States; however, these addresses are being systematically phased out in favor of street style addresses. This address format is used for Rural Route style address (tag 10.016) when there is no dual address preference (tag 13.032) indicated.

FIELDS	**CONTAIN**
Mailstop	10.008
Mailee	10.yyy
Primary Name	**11.002**, **11.003**, 11.004, 11.005, **11.006**, 11.008, 11.007
Title	11.011
Secondary name	11.012, 11.013, 11.014, 11.015, 11.016, 11.018, 11.017
Department/Division	10.006, 10.007
Organization	11.001
Urbanization	10.013
Street Address 2	
Street Address 1	**10.016,** "BOX", **10.036**
City/State/ZIP	**10.018, 10.020, 10.025, "-", 10.026**

MR JOAQUIN HERNANDEZ
RR 2 BOX 914C
SUFFOLK NY 11901-2221

MS J JAMISON
HC 32 BOX 172
NEWBERRY PA 17701-9783

USA TEMPLATE 004 - Military Style Address

The Military Style address is the fourth most common address format used in the United States. If the state code is "AE", "AA" or "AP", the address is a Military style address.

FIELDS	CONTAIN
Mailstop	10.008
Mailee	10.yyy
Primary Name	**11.002**, **11.003**, 11.004, 11.005, **11.006**, 11.008, 11.007
Title	11.011
Secondary Name	11.012, 11.013, 11.014, 11.015, 11.016, 11.018, 11.017
Department/Division	10.006, 10.007
Organization	11.001
Urbanization	10.013
Street Address 2	
Street Address 1	**10.009**, "BOX", **10.036**
City/State/ZIP	**10.018, 10.020, 10.025**, "-", **10.026**

SGT QUENTIN LUCAS
UNIT 15234 BOX N
APO AP 96205-5101

LT LESLIE CARRIO
USS LOUISIANA BOX GOLD
FPO AP 96667-2146

If the Box Number (10.036) is not specified:

FIELDS	CONTAIN
Mailstop	10.008
Mailee	10.yyy
Primary Name	**11.002, 11.003, 11.004, 11.005, 11.006, 11.008, 11.007**
Title	11.011
Secondary Name	11.012, 11.013, 11.014, 11.015, 11.016, 11.018, 11.017
Department/Division	10.006, 10.007
Organization	11.001
Urbanization	10.013
Street Address 2	
Street Address 1	**10.009**
City/State/ZIP	**10.018, 10.020, 10.025**, "-", **10.026**

CAPTAIN JOSEPH PATRICK MICHAEL WILSON JR PHD
USS PATRIOT
APO AE 09492-1927

USA TEMPLATE 005 - Dual Address PO Box Primary/Street Secondary

The Dual Style Address is the fifth most common address format used in the United States. Most commonly, what you see in dual addressing is both a PO Box and a Street style address. The Dual address preference, tag 13.032 value of "PS", indicates a PO Box-Street Order is preferred for this PO BOX and Street style address.

FIELDS	CONTAIN
Mailstop	10.008
Mailee	10.yyy
Primary Name	11.002, **11.003**, 11.004, 11.005, **11.006**, 11.008, 11.007
Title	11.011
Secondary Name	11.012, 11.013, 11.014, 11.015, 11.016, 11.018, 11.017
Department/Division	10.006, 10.007
Organization	11.001
Urbanization	10.013
Street Address 2	**10.002**, 10.xxx, **10.009**, **10.010**, 10.011, 10.012, 10.013
Street Address 1	"PO BOX", **10.015**
City/State/ZIP	**10.018, 10.020, 10.025,** "-", **10.026**

JACK GREEN
600 ABINGTON ST
PO BOX 5001
PEORIA IL 61602-5001

USA TEMPLATE 006 - Dual Address Street Primary/PO Box Secondary

When Dual address preference, tag 13.032 of "SP", is used to indicate a Street Order-PO Box order is preferred for this, Street style and PO BOX address.

FIELDS	CONTAIN
Mailstop	10.008
Mailee	10.yyy
Primary Name	11.002, **11.003**, 11.004, 11.005, **11.006**, 11.008, 11.007
Title	11.011
Secondary Name	11.012, 11.013, 11.014, 11.015, 11.016, 11.018, 11.017
Department/Division	10.006, 10.007
Organization	11.001
Urbanization	10.013
Street Address 2	"PO BOX", **10.015**
Street Address 1	**10.002**, 10.xxx, **10.009**, **10.010**, 10.011, 10.012, 10.013
City/State/ZIP	**10.018, 10.020, 10.025, "-", 10.026**

JACK GREEN
PO BOX 5001
600 ABINGTON ST
PEORIA IL 61601-0011

USA TEMPLATE 007 - Dual Address PO Box Primary/Rural Route Secondary

Less commonly, what you see in dual addressing is both a PO Box and a rural style address. A Dual address preference (tag 13.032 value of "PR") indicates the PO Box is in the Street Address 1 line and the rural style address in the Street Address 2 line.

FIELDS	CONTAIN
Mailstop	10.008
Mailee	10.yyy
Primary Name	**11.002, 11.003**, 11.004, 11.005, **11.006**, 11.008, 11.007
Title	11.011
Secondary Name	11.012, 11.013, 11.014, 11.015, 11.016, 11.018, 11.017
Department/Division	10.006, 10.007
Organization	11.001
Urbanization	10.013
Street Address 2	**10.016**, “BOX”, **10.036**
Street Address 1	"PO BOX", **10.015**
City/State/ZIP	**10.018, 10.020, 10.025, "-", 10.026**

MS JOAN WYNDHAM
RR1 BOX 56
PO BOX 349
BOGLE CORNER IN 47438-0349

USA TEMPLATE 008 - Dual Address Rural Route Primary/PO Box Secondary

When the Dual address preference tag 13.032 contains "RP", it indicates a Street/PO Box Order is preferred for the PO BOX and Rural Route style address.

FIELDS	CONTAIN
Mailstop	10.008
Mailee	10.yyy
Primary Name	**11.002**, **11.003**, 11.004, 11.005, **11.006**, 11.008, 11.007
Title	11.011
Secondary Name	11.012, 11.013, 11.014, 11.015, 11.016, 11.018, 11.017
Department/Division	10.006, 10.007
Organization	11.001
Urbanization	10.013
Street Address 2	"PO BOX", **10.0 15**
Street Address 1	**10.016**, “BOX”, **10.036**
City/State/ZIP	**10.018, 10.020, 10.025, "-", 10.026**

MS JOAN WYNDHAM
PO BOX 349
RR1 BOX 56
BOGLE CORNER IN 47438-0056

Postal Operations Council

STANDARDS BOARD

Brussels, 30 January 2001

Identify address and other related elements and apply standard definitions to these elements to facilitate the collection and exchange of International Name and Address Information. The tasks proposed herein support the UPU Congress Resolution C87 and Tactic 4.3.3 of the Union's Strategic Plan (Request for Status P).

Proposal by the POC POST*Code Project Team / POST*Code "Technological Development" Sub-Project Team chaired by the USPS.

Subject	**References Paragraphs**
Proposal for the acceptance of a standard to identify and define address elements to facilitate the collection and exchange of international name and address information as a new work item (Status P). This project includes identifying and defining international name and address information in consultation with the CEN, UN/EDIFACT subcommittees, UPU Standards Board, members of the UPU Direct Marketing Advisory Board (DMAB) and other interested member nations and parties.	1 - 14
Decisions expected The TSB is requested to agree that: - Status P should be given to this subject.	

1) This document is a proposal for the identification and definition of address elements and other related work items contained within UPU Congress Resolution C87 and tactic 4.3.3 of the Unions Strategic Plan to facilitate name and address information exchange as a new work item (Request for Status P). The POST*Code "Technological Development" Sub-Project Team submits that this proposal supports the goal to make POST*Code more functional in relation to addressing by allowing the automatic formatting of addresses.

2) Efforts are currently underway to create an international address standard in both the UN/EDIFACT Subcommittee and in the CEN as well as other efforts by the UPU's POC POST*Code Project team. To be inclusive and complete, all such efforts will require input from the members of the UPU. Therefore, it seems appropriate to formalize this project's status within the UPU standardization process and combine our efforts with those of the CEN and UN/EDIFACT.

3) This document contains all required information for a new work item. The checklist required for a Status P to be granted is reproduced on the next page. A reference is included behind each topic indicating where the relevant information can be found in the document.

4)

Information to be provided in an application for Status P (new work):	**Information can be found in:**
Subject, including the title of the proposed standard (proposals must be encouraged from all interested parties, i.e. postal administrations and trading partners).	**I**
Scope of proposed standard. What it covers and what it excludes.	**II**
A preliminary assessment of the relationship of the proposed standard to: - Other existing standards; - Other standards related projects; - The activities of other international bodies.	**III**
A preliminary assessment of the purpose and justification of the proposed standard, including: - The technical advantages which would result from the adoption of the proposed standard; - The benefits and potential costs of the proposed standard covering the interests of all member administrations of the UPU and stakeholders.	**IV**
Proposal for the consultation group that would provide information to the POC POST*Code Project Team in the project work related to the development of the standard and the participants of the group.	**V**
Description for the completion of the next phase. At least the following information should be provided: - Responsibility for this phase; - Participants; - Deliverables; - Milestones.	**VI**

I. Subject and Project Title

5) This project goal is to establish a standard for the identification and definition of address elements to facilitate international name and address information exchange . Complete and properly formatted addresses:

- improve the likelihood that the intended recipient will receive their mail
- speed the delivery of the mail piece
- are less costly for the post to deliver thus helping the post control postage fees

Mail reaching the intended customer, at a reasonable cost with prompt delivery will lead to greater stakeholder satisfaction.

6) The proposed title for this project is "**Identify and apply standard definitions to international address elements".**

7) The ongoing name and address information Message in Development (MID) in the UN/EDIFACT Subcommittee is PROLST. Members of the direct mail marketing industry with assistance from the UPU DMAB have been leading this project. There is also an ongoing CEN project CENTC 331 WI015, Postal Services - Address Data Bases.

8) It is important that this effort works in cooperation with ongoing international standards projects such as the CEN project CENTC 331 WI015 Postal Services - Address Data Bases, POC POST*Code Project Team and other standards efforts to avoid, as much as possible, any formatting and interpretation differences among the respective standards.

II Scope of the proposed project

9) This project proposes to:

- Identify and define international address elements
- Define an element by element order of presentation for each country
- Note optional and mandatory address information
- Specify address element abbreviations and rendition instructions by country
- Determine by country the preferred and acceptable character sets (Romanji, Kanji, Cyrillic, etc.)

III An assessment of the relationship of the proposed standard to other existing standards, standards-related projects, and the activities of other international bodies

10) A potential international name and address standard is conceivably related to the following:

Related postal standards:	
Standard Reference	**Title**

- Related international name and address standards efforts are the CEN and UN/EDIFACT projects in development (Postal Services - Address Data Bases, PROLST).

- Standards-related projects, any regional international name and address EDI projects, any other international name and address standardization work, and other pertinent efforts:

  - The Graphic Communications Association (GCA) is working on an international address standard (ADIS).

- The US Federal Graphic Data Committee (FGDC) also has a project, Address Data Content Standard in the Subcommittee on Cultural and Demographic Data.

IV Purpose and justification of the proposed standard

11) With the advent of the Internet, companies that had been solely domestic enterprises have suddenly found themselves involved in international commerce. Cross-border mail is increasing substantially. Companies that developed customer databases based upon domestic addressing requirements are suddenly finding these databases entirely inadequate for the storage of multinational address information. To complicate the matter, international address information is not readily available, and what is available is frequently not maintained in a timely manner. This standard, developed by the UPU, would serve as a guideline for companies and posts to look to for assistance not only in maintaining international name and address information but also with exchanging and printing international address information.

12) The mere fact that so many organizations are trying to develop international name and address standards is indicative of the need for the information.

V. The Development Group

13) The development group should consist of members from interested posts under the direction of the chair of the POST*Code "Technological Development" Sub-Project Team. This effort would be supplemented by consultation with the CEN, UN/EDIFACT subcommittees, the UPU Standards Board, UPU Direct Marketing Advisory Board, and other interested member nations, stakeholders and parties.

VI. The Next Phase

14) These follow up actions are now proposed:

- Establish a Development Group with a vested interest in the development of an international name and address standard.
- Review the work already underway in the CEN, UN/EDIFACT and GCA.
- Identify an initial country or group of countries that are prepared to work with the development group to:
  - Identify address elements
  - Define a line by line order of presentation (template) for each country
  - Identify order and location of address elements within the country template. There may be several resulting sub-templates based on variations in types of addresses within a country
  - Note optional and mandatory address information
  - Specify acceptable address abbreviations and rendition instructions
  - Determine preferred and acceptable character sets (Romanji, Kanji, Cyrillic, etc.)
- Develop, publish and support a procedure that makes the information easy to maintain.
- When complete, the information should be made available on the UPU and or POST*Code WEB site and its use encouraged by all stakeholders.

Postal Operations Council

STANDARDS BOARD

Brussels, 30 January 2001

Develop EDI and XML message and procedure to facilitate the exchange and final presentation of International Name and Address Information (request for Status P)

Proposal by the United States Postal Service (USPS) and the Address Management Project Team of the Direct Mail Advisory Board.

Subject	**References Paragraphs**
Proposal for the acceptance of a standard to transmit international name and address data, defined as separate identified elements, among parties, including final presentation on a mail piece, as a new work item (Status P). This project will utilize address elements determined as the output from a separate work item led by a POST*Code team working in conjunction with the CEN, UN/EDIFACT subcommittees and members of the UPU Direct Marketing Advisory Board (DMAB).	1 - 17
Decisions expected The TSB is requested to agree that: - Status P should be given to this subject.	

I Introduction

1) This document is a proposal for a new work item (Status P) to develop standard EDI and XML messages to facilitate name and address information exchange, including final presentation on a mail piece. The goal is to provide standard messages that utilize address elements defined and identified as the output of a separate work item to allow for greater clarity about the nature and characteristics of the name and address information to be transmitted. The standard messages will provide the capability for intelligent rendition of the name and address elements even when the mail piece cannot represent all the available information, in such a way as to preserve address quality and maintain mail piece deliverability.

2) This work item falls within the scope of current efforts to create a comprehensive international address standard in both the UN/EDIFACT Subcommittee and in the CEN. The comprehensive standard includes definition and identification of named address elements, transmission of data between parties, rules for presenting data on the mail piece, validation of the address data, and procedures for converting data currently retained in block or line by line formats to the new element by element formats. To be inclusive and complete, both of these efforts will require input

from the member posts of the UPU. Therefore, it is appropriate for this effort to be carried out under the overall auspices of the UPU standardization process in conjunction with the work of the CEN and UN/EDIFACT.

3) This document contains all required information for a new work item. The checklist required for a Status P to be granted is reproduced on the next page. For each topic, a reference indicates where the relevant information can be found in the document.

4)

Information to be provided in an application for Status P (new work):	**Information can be found in:**
Subject, including the title of the proposed standard (proposals must be encouraged from all interested parties, i.e. postal administrations and trading partners).	**I**
Scope of proposed standard. What it covers and what it excludes.	**II**
A preliminary assessment of the relationship of the proposed standard to: - Other existing standards; - Other standards related projects; - The activities of other international bodies.	**III**
A preliminary assessment of the purpose and justification of the proposed standard, including: - The technical advantages which would result from the adoption of the proposed standard; - The benefits and potential costs of the proposed standard covering the interests of all member administrations of the UPU.	**IV**
Proposal for the development group that should be responsible for the project work related to the development of the standard and the participants of the group.	**V**
Description for the completion of the next phase. At least the following information should be provided: - Responsibility for this phase; - Participants; - Deliverables; - Milestones.	**VI**

Subject and Project Title

4) The goal of this project is to establish a standard for the transmission, and formatted presentation on a mail piece, of name and address information that has been defined in terms of separately identified address elements. This will facilitate international name and address information exchange and result in improved address quality and better mail piece deliverability. Further, it will reduce costs for the posts and enhance the value of mail as a consistent and reliable method of communication.

5) The proposed title for this work item is "**Develop EDI and XML message and procedure to facilitate the exchange and final presentation of International Name and Address Information".**

II Scope of the proposed project

6) This project proposes to:

- Utilize the international address elements identified in a separate work item
- Develop the capability to utilize a standard order of presentation or template for each country, supporting variations in language, region or content
- Support by country, the preferred and acceptable character sets (Latin, Arabic, Kanji, Cyrillic, etc.) including diacritics and regional variants
- Develop EDI and XML messages to provide standard protocols for data transmission of international name and address data
- Identify standard operations and techniques for the specification of printing rules and rendition instructions to allow formatting of addresses when constraints exist on available space
- Develop a reference implementation to illustrate the functions of the standard operations
- Specify where possible those modifications of address elements that the Posts designate as acceptable for the purposes of maintaining address quality and deliverability
- Define a technique for evaluating address data sets in terms of completeness and correctness when measured against external data files maintained by the Posts or by the UPU
- Define a technique for evaluating a mailing data set with reference to the proportion of addresses which meet the quality standards of the Posts where these have been specified.

III An assessment of the relationship of the proposed standard to other existing standards, standards-related projects, and the activities of other international bodies

7) A potential international name and address standard is conceivably related to the following:

Related postal standards:	
Standard Reference	**Title**
S-12	Format of Message Exchanges

8) The name and address information Message in Development (MID) in the UN/EDIFACT Subcommittee is PROLST. Members of the direct mail marketing industry with assistance from members of the UPU Direct Mail Advisory Board have been leading this project.

9) The CEN project CEN TC 331 WI 015, Postal Services - Address Data Bases has a five part project plan, including definition of address elements, definition of printing rules, transmission of address data among parties, validation of address data against external files, and conversion of existing data to the standard format. The focus is on European addresses.

10) The Graphic Communications Association (GCA) is working on an international address standard, Address Data Interchange Specification (ADIS) The ADIS project shares the CEN goals and objectives, with an additional focus on non-address related postal information that may appear on a mail piece. The GCA is represented on the UPU Direct Mail Advisory Board.

11) The US Federal Graphic Data Committee (FGDC) also has a project, Address Data Content Standard, in the Subcommittee on Cultural and Demographic Data.

12) It is important that this effort is carried out in cooperation with the ongoing international address standardization efforts, including those referenced, in order to minimize any differences in formatting and interpretation among the respective standards publications.

IV Purpose and justification of the proposed standard, including technical advantages, benefits and costs

13) With the growth of international commerce and cross-border mail, it is increasingly important for companies to acquire, maintain and transmit mailing lists using address information from many countries. Accurate information on international address formats is not readily available, and no standards currently exist which allow maintenance of a single database of multinational name and address information in an internationally accepted manner. Many practitioners believe that the use of individually identified and separately stored address elements offers a way to create this needed capability. However, this methodology will not be adopted unless it includes an effective way to reconstitute mailing addresses from the separate elements, meeting different requirements for different situations. This standard, developed by the UPU, would serve as a guideline for companies and Posts for assistance in maintaining, exchanging and printing international address information.

14) The project aims to develop messages using two distinct protocols, which we designate as EDI and XML respectively, recognizing that in a generic sense both of these are forms of Electronic Data Interchange, or EDI. When we refer in the specific sense to EDI we mean the protocol used in UN/EDIFACT. When we refer to XML we mean the Extensible Markup Language protocol developed and maintained by the World Wide Web Consortium (W3C). XML includes related standards such as Extensible Stylesheet Language (XSL) and XSL Transformations (XSLT) which will enable a standard definition of certain operations upon name and address elements in the form of a reference implementation for the standard. This is needed to assist users in developing conforming applications for the standard and to minimize ambiguity concerning the content of the standard.

15) The reasons for using both EDI in the specific sense indicated and XML as protocols deserve further explanation. EDI in the specific sense is best suited for the transmission of data among parties with complex data processing infrastructures. On the other hand, when name and address data or mailing job data are currently transmitted, even between large companies, this is often done without reference to rigorous standards of any kind. It is unclear whether development of an EDI message in the specific sense will result in adoption rates that are sufficient for a widely accepted

standard. At the same time, XML is achieving rapid growth in the area of Internet data transfers and is becoming a de facto standard in that arena. The best evidence for this is that EDI in the specific sense is starting to evolve in the direction of XML, taking the form of a hybrid often referred to as EDI/XML. However, native XML offers several advantages not available from translation of current EDI messages to work in an XML environment. These advantages include improved ability to constrain data values, better application portability, the availability of inexpensive or free development tools, and the existence of executable functions under XSLT that are defined wholly within the larger XML standard. For these reasons, it is advantageous to define the proposed standard using both the EDI protocol, which will allow for conversion in a straightforward manner to EDI/XML, and in a native XML protocol, incorporating XSL and XSLT for added functionality

V. The Development Group

16) The development group should consist of members from interested posts, from the POST*Code "Technological Development" Sub-Project Team, from the appropriate CEN task forces, and from the Address Management Project Team of the UPU Direct Marketing Advisory Board and other interested stakeholders. It should work within the administrative structure of the UPU Standards Board as may be appropriately designated.

VI. The Next Phase

17) These follow up actions are now proposed:

- Establish a Development Group mandated to work toward the development of a comprehensive international name and address standard.
- Establish formal lines of communication with the POC POST*Code Project Group.
- Use the results and recommendations from the POST*Code "Technological Development" Sub-Project Team to:
  - Develop techniques to utilize optional and mandatory address information to achieve a final mail piece presentation using database of the name and address elements individually identified and separately stored
  - Develop methods to reorganize, combine and shorten name and address elements to achieve the best possible final presentation of the data within the constraints set by the mail piece design and the available mailing production technology
  - Develop EDI and XML messages to provide standard protocols for data transmission, including additions, deletions, and changes to data sets
  - Specify where possible those modifications of address elements that the Posts designate as acceptable for the purposes of maintaining address quality and deliverability
  - Define a technique for evaluating address data sets in terms of completeness and correctness when measured against external data files maintained by the Posts and/or by the UPU
  - Define a technique for evaluating a mailing data set with reference to the proportion of addresses which meet the quality standards of the Posts where these have been specified

- Develop, publish and support a procedure that makes the information easy to maintain.
- When complete, make the information available on the UPU Web site and/or other related sites encourage its use by all stakeholders.