#### american national standards institute, inc.

Cable: Standards, New York

International Telex: 42 42 96 ANSI LM

STATEMENT OF PATENT HOLDER CONCERNING THE USE OF PATENTED DEVICE OR DESIGN IN CONJUNCTION WITH AN AMERICAN NATIONAL STANDARD

Note: This form is to be used to record the statement of a patent holder whose patented device or design (pending or approved) may have to be used by a person or organization complying with an American National Standard. This statement is filed and retained pursuant to Section 7.4 of the American National Standards Institute Procedures for Management and Coordination of American National Standards.

National	l Standard:	s.				
1. Name of Pa	tent Hol	der: Amati	Communication	s Corporatio	<u>n</u>	
Address:	1975 W		ations Corporati o Real #303 40		none: 415-903-2350	<u>)</u>
Contact:	Mr. Ro	n Carlini, \	VP of Strategic B	usiness Devel	<u>opment</u>	
2. Number an	d Descri	ption of Pat	ent: (use extra sh	eet if necessar	Δ	
Patent Numbe	er (s):	pending.				
Title: Invtrs: Dated:	John M.	rrier Modulat Cioffi, Po To Igust 17, 1993	tion Transmission S ong, James T. Aslani	ystem with Vari s, and Antoinet	able Delay e H. Gooch	
varving require	to vary the ements of tone-shu	he latency and different trai	d power of applied of applied of applied of applications appropriately applications.	error-correcting a data signals in	n-on-demand feature of codes to correspond of T1.413 ADSL. This perfects in the low-la	to the paten
Pertinent Cla	ims:	All.				
Date of Expir	ration:	August 20	13-2014			
Pending:		х	Approved:		(check one)	
			of application: original claimant	attach the tra	nsfer agreement.	

3. Name of Proposed ANSI Standard: ANSI T1.413-1995 Network and Customer Installation Interfaces - Asymmetric Digital Subscriber Lines (ADSL) Metallic Interface.

List sections of standard to which patent claims relate: Chapters 5,6,7

Are there any licenses? <u>yes</u> If so, how many? <u>2, at present.</u> Please attach a copy of license agreement, if any. (confidential)

## 5. Statement of Patent Holder

Please check	one of the following statements:	(check one)		
(a)	A license shall be made available without compensation to applicants desiring to utilize the license for the purpose of implementing the standard or,			
<b>(b)</b>	A license shall be made available to applicants under reasonable terms and conditions that are demonstrably free of anyunfair discrimination.	х		
(c)	An assurance of non-assertion will be filed with the Patent Office by the effective date of ANSI approval of the listed standard:			
Signed:	(J.M. Cioffi)	Chief Technical Officer		
Company: Amen Com	(Name) nunications Inc.	(Title)		
Date: <u>June 11, 1996</u>				



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National	Standards.
I. Name of Par	tent Holder: Amati Communications Corporation
Address:	Amati Communications Corporation 1975 W. El Camino Real #303  Mt. View, CA 94040  Telephone: 415-903-2350
Contact:	Mr. Ron Carlini, VP of Strategic Business Development
2. Number and	d Description of Patent: (use extra sheet if necessary)
Patent Number	er (s): <b>pending.</b>
Title: Invtrs: Dated:	Mitigating Clipping and Quantization Effects in Digital Transmission Systems Jacky S. Chow, John A.C. Bingham, Mark B. Flowers, John M. Cioffi filed, December 13, 1993
clipping with D average power Amati has devel	This application claims several variations of methods used to reduce effects of DMT. DMT signals, as they are close to optimum, exhibit necessarily high peak-to-ratio. This high PAR can significantly increase the cost of designed equipment loped methods to reduce this effect that are claimed in this application, both for echo-on echo-cancelled transmission.
Pertinent Clai	ms: All.
Date of Expir	ration: 2013-2014
Pending:	x Approved: (check one)
If pendiff patent hold	ding, indicate date of application: ler is a transferee of original claimant, attach the transfer agreement.

3. Name of Proposed ANSI Standard: ANSI T1.413-1995 Network and Customer Installation Interfaces - Asymmetric Digital Subscriber Lines (ADSL) Metallic Interface.

List sections of standard to which patent claims relate: Chapters 6,7,10

Are there any licenses? <u>yes</u> If so, how many? <u>2, at present.</u> Please attach a copy of license agreement, if any. (confidential)

## 5. Statement of Patent Holder

Please check	k one of the following statements:	(check one)		
(a)	A license shall be made available without compensation to applicants desiring to utilize the license for the purpose of implementing the standard or,			
<b>(b)</b>	A license shall be made available to applicants under reasonable terms and conditions that are demonstrably free of anyunfair discrimination.	x		
(6)	An assurance of non-assertion will be filed with the Patent Office by the effective date of ANSI approval of the listed standard.			
Signed:	m. C. (I.M. Cioffi)	Chief Technical Officer		
Company. Amati Con	(Name)	(Title)		
Date: June 11, 1996				

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1 tationa	i Standards.	
1. Name of Pa	stent Holder: Amati Communications Corporation	
Address:	Amati Communications Corporation 1975 W. El Camino Real #303 Mt. View, CA 94040  Telephone: 415-903-2350	
Contact:	Mr. Ron Carlini, VP of Strategic Business Development	
2. Number an	nd Description of Patent: (use extra sheet if necessary)	
Patent Number	er (s): <u>US Patent #5,400,322</u>	
	Updating of Bit Allocations in a Multicarrier Modulation Transmission System Ronald R. Hunt and Peter S. Chow March 21, 1995	
Description: ADSL Standard	This patent describes the specific protocol or mechanism placed into the T1 d for transmitter/receiver sharing of bandwidth-optimization results.	.413
Pertinent Clai	ims: All.	
Date of Expir	ration: August 2010.	
Pending:	Approved: x (check one)	
	ding, indicate date of application: ler is a transferee of original claimant, attach the transfer agreement.	
	roposed ANSI Standard: ANSI T1.413-1995 Network and Customer Installations of the Customer Installation	<u>on</u>
List sections	of standard to which patent claims relate: Chapters 12 and 13.	

Are there any licenses? <u>yes</u> If so, how many? <u>3, at present.</u> Please attach a copy of license agreement, if any. (confidential)

## 5. Statement of Patent Holder

Please check	one of the following statements:	(check one)	
(a)	A license shall be made available without compensation to applicants desiring to utilize the license for the purpose of implementing the standard or,		
(b)	A license shall be made available to applicants under reasonable terms and conditions that are demonstrably free of anyunfair discrimination.	x	
(c)	An assurance of non-assertion will be filed with the Patent Office by the effective date of ANSI approval of the listed standard.		
Signed	1.M. Cioffi)	Chief Technical Officer	
Company: Amati Com	(Name)	(Title)	
Date: June 11, 1996			
		· ·	



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National Standa	onal Standards Institute Procedures for Management and Coordination of American ards.
1. Name of Patent H	older: Stanford University
	ti Communications Corporation, (Exclusive License and icense priviledge)
<u> 1975</u>	W. El Camino Real #303 Telephone: 415-903-2350
	Ron Carlini, VP of Strategic Business Development
2. Number and Des	cription of Patent: (use extra sheet if necessary)
Patent Number (s):	US Patent #5,479,447
High-Speed D	od and Apparatus for Adaptive Variable Bandwidth Optimization in ata Transmission of a Multicarrier Signal over Digital Subscriber Lines. S. Chow and John M. Cioffi aber 26, 1996
	is patent fundamentally claims the adaptive continuous variation hat inherent in the T1.413 ADSL Standard.
Pertinent Claims:	All.
Date of Expiration:	December 2013.
Pending:	Approved: x (check one)
	ndicate date of application: transferee of original claimant, attach the transfer agreement.
	d ANSI Standard: ANSI T1.413-1995 Network and Customer Installation ic Digital Subscriber Lines (ADSL) Metallic Interface.

List sections of standard to which patent claims relate: Chapters 12 and 13.

Are there any licenses? <u>yes</u> If so, how many? <u>2, at present.</u> Please attach a copy of license agreement, if any. (confidential)

## 5. Statement of Patent Holder

Please check one of	(check one)	
withou desirin	ase shall be made available t compensation to applicants g to utilize the license for pose of implementing the rd or,	
to appl conditi	nse shall be made available icants under reasonable terms and ons that are demonstrably free unfair discrimination.	х
filed w effecti	urance of non-assertion will be rith the Patent Office by the ve date of ANSI approval of standard.	
Signed: M.	(J.M. Cioffi)	Chief Technical Officer
(Name Company: Amati Communication		(Title)
Date: June 11, 1996	·	



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#### STATEMENT OF PATENT HOLDER CONCERNING THE USE OF PATENTED DEVICE OR DESIGN IN CONJUNCTION WITH AN AMERICAN NATIONAL STANDARD

Note: This form is to be used to record the statement of a patent holder whose patented device or design (pending or approved) may have to be used by a person or organization complying with an American National Standard. This statement is filed and retained pursuant to Section 7.4 of the American National Standards Institute Procedures for Management and Coordination of American National Standards.

1. Name of Patent Holder: Stanford University
---

Address:

Amati Communications Corporation, (Exclusive License and

Sublicense priviledge)

1975 W. El Camino Real #303 Telephone: 415-903-2350

Mt. View, CA 94040

Contact:

Mr. Ron Carlini, VP of Strategic Business Development

2. Number and Description of Patent: (use extra sheet if necessary)

Patent Number (s):

**US Patent #5,285,474** 

Title:

Method for Equalizing a Multicarrier Signal in a Multicarrier Communication

Invtrs: Jacky S. Chow and John M. Cioffi

Dated: February 8, 1994

Description: This patent distinguishes DMT from other multicarrier methods, and describes a structure used to effect large reduction in the receiver complexity of DMTwithout performance loss. The FFT size in the standard is too small for best performance of multicarrier (to keep latency to a barely acceptable minimum). This patent's describes means for the receiver to recover the performance loss that would have occurred because of the small-size FFT.

Pertinent Claims:	All.			
Date of Expiration:	June 16, 2012			
Pending:		Approved:	x	(check one)
If pending, in If patent holder is a	ndicate date of ap transferee of orig	. •	attach the tra	nsfer agreement.

3. Name of Proposed ANSI Standard: ANSI T1.413-1995 Network and Customer Installation Interfaces - Asymmetric Digital Subscriber Lines (ADSL) Metallic Interface. List sections of standard to which patent claims relate: Chapters 6-10.

Are there any licenses? <u>yes</u> If so, how many? <u>3, at present.</u> Please attach a copy of license agreement, if any. (confidential)

## 5. Statement of Patent Holder

Please chec	ck one of the following statements:	(check one)		
(a)	A license shall be made available without compensation to applicants desiring to utilize the license for the purpose of implementing the standard or,			
<b>(b)</b>	A license shall be made available to applicants under reasonable terms and conditions that are demonstrably free of anyunfair discrimination.	х		
(c)	An assurance of non-assertion will be filed with the Patent Office by the effective date of ANSI approval of the listed standard.			
Signed:	m. (J.M. Cioffi)	Chief Technical Officer		
Company: Amati Co	(Name) mmunications Inc.	(Tide)		
Date: <u>June 11, 199</u>	6			

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# STATEMENT OF PATENT HOLDER CONCERNING THE USE OF PATENTED DEVICE OR DESIGN IN CONJUNCTION WITH AN AMERICAN NATIONAL STANDARD

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•						
1. Name of Par	tent Ho	lder: Stanfo	ord University			
Address:	<u>Sublic</u> 1975 V	<u>cense privile</u>	o Real #303		License and none: 415-903-2350	
Contact:	Mr. R	on Carlini, V	VP of Strategic B	usiness Devel	<u>opment</u>	
2. Number an	d Desc	ription of Pat	ent: (use extra she	et if necessary	J.	
Patent Numbe	r (s):	US Patent	\$5,317,596			
Title: Invtrs: Dated:	Minnie	Ho and John		ation with Discre	ete Multîtone Modulati	on
the T1.413 ADS	SL Stan	dard. All Cat		ems in T1.413 t	plexity echo cancellations DMT echo cancellations	
Pertinent Clai	ms:	All.				
Date of Expira	ation:	December	1, 2012			
Pending:			Approved:	х	(check one)	
	•		f application: original claimant,	attach the tran	sfer agreement.	
3 Name of Pr	ranased	ANSI Stand	ard· ANSI T1 413.	1995 Network a	nd Customer Installati	ion

3. Name of Proposed ANSI Standard: ANSI T1.413-1995 Network and Customer Installation Interfaces - Asymmetric Digital Subscriber Lines (ADSL) Metallic Interface.

List sections of standard to which patent claims relate: Chapters 6-10,11.

Are there any licenses? <u>ves</u> If so, how many? <u>3, at present.</u> Please attach a copy of license agreement, if any. (confidential)

#### 5. Statement of Patent Holder

Please check one of the following statements:	(check one)		
(a) A license shall be made available without compensation to applicants desiring to utilize the license for the purpose of implementing the standard or,			
(b) A license shall be made available to applicants under reasonable terms and conditions that are demonstrably free of anyunfair discrimination.	x		
(c) An assurance of non-assertion will be filed with the Patent Office by the effective date of ANSI approval of the listed standard.			
Signed (J.M. Cioffi)	Chief Technical Officer (Title)		
(Name) Company: Amati Communications Inc.	(rine)		
Date: <u>June 11, 1996</u>			

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Nadoliu	, Dimbon 60.
1. Name of Pa	tent Holder: Amati Communications Corporation
Address:	Amati Communications Corporation 1975 W. El Camino Real #303 Telephone: 415-903-2350 Mt. View, CA 94040
Contact:	Mr. Ron Carlini, VP of Strategic Business Development
2. Number ar	d Description of Patent: (use extra sheet if necessary)
Patent Number	er (s): <b>pending.</b>
	Frame Synchronization in Multicarrier Transmission Systems James T. Aslanis and Jacky S. Chow filed, July 15, 1994
Description: T1.413 ADSL S	This method claims the methods used for recovering from microinterruptions in the tandard.
Pertinent Cla	ims: All.
Date of Expir	ration: July 15, 2014
Pending:	x Approved: (check one)
	ding, indicate date of application: ler is a transferee of original claimant, attach the transfer agreement.
	roposed ANSI Standard: ANSI T1.413-1995 Network and Customer Installation ymmetric Digital Subscriber Lines (ADSL) Metallic Interface.
List sections	of standard to which patent claims relate: Chapters 6,7

4. Terms and Conditions of License

Are there any licenses? <u>yes</u> If so, how many? <u>2, at present.</u> Please attach a copy of license agreement, if any. (confidential)

## 5. Statement of Patent Holder

Please check one of the following statements:	(check one)	
(a) A license shall be made available without compensation to applicants desiring to utilize the license for the purpose of implementing the standard or,		
(b) A license shall be made available to applicants under reasonable terms and conditions that are demonstrably free of anyunfair discrimination.	x	
(c) An assurance of non-assertion will be filed with the Patent Office by the effective date of ANSI approval of the listed standard.		
Signed: (I.M. Cioffi)	Chief Technical Officer	
(Name) Company: Amati Communications Inc.	(Title)	
Date:		

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International Telex: 42 42 96 ANSI LM

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•					
I. Name of Pa	tent Ho	der: Amati	Communication	s Corporation	i
Address:	1975 V	Communica V. El Camino ew. CA 9404			one: <b>415-903-2350</b>
Contact:	Mr. R	on Carlini, V	P of Strategic B	usiness Develo	pment
2. Number an	d Descr	iption of Pate	nt: (use extra she	eet if necessary	)
Patent Numbe	er (s):	pending.			÷ *
	ADSL e	cho-cancelled l I. Flowers, Micl			nired ADS precision in
Description: ADC at 4 Mi		eeps the ADC	C/DAC precision	ı to a minimum	level, including 12-bi
Pertinent Clai	ms:	All.			
Date of Expir	ation:	June 2016			
Pending:		х	Approved:		(check one)
		dicate date of ransferee of o	`application: riginal claimant,	attach the tran	sfer agreement.
			ard: ANSI T1.413 riber Lines (ADSL		nd Customer Installation ce.
List sections	of stand	lard to which	patent claims rel	late: Chapters	6,7,12, 13

Are there any licenses? <u>yes</u> If so, how many? <u>2, at present.</u> Please attach a copy of license agreement, if any. (confidential)

## 5. Statement of Patent Holder

Please chec	k one of the following statements:	(check one)		
(a)	A license shall be made available without compensation to applicants desiring to utilize the license for the purpose of implementing the standard or,			
(b)	A license shall be made available to applicants under reasonable terms and conditions that are demonstrably free of anyunfair discrimination.	х		
(c)	An assurance of non-assertion will be filed with the Patent Office by the effective date of ANSI approval of the listed standard			
Signed:	M. Cioffi)	Chief Technical Officer		
Company: Amati Con	(Name) munications Inc.	(Title)		
Date: <u>June 11, 1996</u>				

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Cable: Standards, New York

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National	Standards.		
1. Name of Patent Holder: Amati Communications Corporation			
Address:	Amati Communications Corporation 1975 W. El Camino Real #303 Telephone: 415-903-2350 Mt. View, CA 94040		
Contact:	Mr. Ron Carlini, VP of Strategic Business Development		
2. Number an	d Description of Patent: (use extra sheet if necessary)		
Patent Numbe	r (s): <b>pending.</b>		
	Efficient Address Generation for Convolutional Interleaving Using Minimal Amount of Memory Po Tong filed, February 1996		
Description: The technique allows for reduction by a factor of 1/4 of the amount of RAM required for convolutional interleaving, specifically for the interleaving scheme used in the T1.413 ADSL Standard.			
RAM requir	ed for convolutional interleaving, specifically for the interleaving		
RAM requir	ed for convolutional interleaving, specifically for the interleaving in the T1.413 ADSL Standard.		
RAM requirescheme used	ed for convolutional interleaving, specifically for the interleaving in the T1.413 ADSL Standard.  ms: All.		
RAM requires scheme used Pertinent Clair	ed for convolutional interleaving, specifically for the interleaving in the T1.413 ADSL Standard.  ms: All.		
RAM requires scheme used  Pertinent Claire  Date of Expire  Pending:	red for convolutional interleaving, specifically for the interleaving in the T1.413 ADSL Standard.  ms: All.  ation: February 2016		
RAM requires scheme used  Pertinent Claire Date of Expire Pending:  If pen If patent hold  3. Name of P	red for convolutional interleaving, specifically for the interleaving in the T1.413 ADSL Standard.  ms: All.  ation: February 2016  x Approved: (check one)  ding, indicate date of application:		

Are there any licenses? <u>yes</u> If so, how many? <u>2, at present.</u> Please attach a copy of license agreement, if any. (confidential)

#### 5. Statement of Patent Holder

Please check one of the following statements:			(check one)	
(a)	A license shall be made ava- without compensation to ap desiring to utilize the licens the purpose of implementin standard or,	plicants e for		
<b>(b)</b>	A license shall be made ave to applicants under reasonal conditions that are demonst of anyunfair discrimination	bie terms and rably free		x
(c) An assurance of non-assertion will be filed with the Patent Office by the effective date of ANSI approval of the listed standard.				
Signed:	m. Cart	(J.M. Cioffi)	Chief Technical Off	icer
Company: Amati Con	(Name) nmunications Inc.		(Title)	
Date: June 11, 199	5			•