



APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/169,603	10/21/2014	8866589	3781/1016	7068

2101 7590 10/01/2014
Sunstein Kann Murphy & Timbers LLP
125 SUMMER STREET
BOSTON, MA 02110-1618

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

M2M Solutions LLC, Stratford-upon-Avon, UNITED KINGDOM, Assignee (with 37 CFR 1.172 Interest);
Eveline Wesby-van Swaay, Stratford-upon-Avon, UNITED KINGDOM;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Wesby-van Swaay	Att'y Docket:	3781/1016
Appln. No.:	14/169,603	Filing Date:	January 31, 2014
Customer No.:	02101	Conf. No.:	7068
Examiner:	Nguyen, Nam V.	Art Unit:	2682
Invention:	PROGRAMMABLE COMMUNICATOR		

VIA USPTO ELECTRONIC FILING SYSTEM

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT AFTER ALLOWANCE UNDER 37 C.F.R. § 1.312

Dear Sir:

Pursuant to 37 C.F.R. 1.312, Applicant respectfully submits this amendment following the Notice of Allowance dated August 11, 2014, on or before payment of the issue fee:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks begin on page 7 of this paper.

OK TO ENTER: /N.N./

09/09/2014



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/169,603	01/31/2014	Eveline Wesby-van Swaay	3781/1016	7068
2101	7590	09/16/2014	EXAMINER	
Sunstein Kann Murphy & Timbers LLP 125 SUMMER STREET BOSTON, MA 02110-1618			NGUYEN, NAM V	
			ART UNIT	PAPER NUMBER
			2682	
			NOTIFICATION DATE	DELIVERY MODE
			09/16/2014	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

usptomail@sunsteinlaw.com

Response to Rule 312 Communication	Application No.	Applicant(s)
	14/169,603	WESBY-VAN SWAAY, EVELINE
	Examiner	Art Unit
	NAM V. NGUYEN	2682

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

1. The amendment filed on 15 August 2014 under 37 CFR 1.312 has been considered, and has been:

- a) entered.
- b) entered as directed to matters of form not affecting the scope of the invention.
- c) disapproved because the amendment was filed after the payment of the issue fee.
Any amendment filed after the date the issue fee is paid must be accompanied by a petition under 37 CFR 1.313(c)(1) and the required fee to withdraw the application from issue.
- d) disapproved. See explanation below.
- e) entered in part. See explanation below.

	/NAM V NGUYEN/ Primary Examiner, Art Unit 2682
--	---

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Eveline Wesby-van Swaay

Application No.: 14/169,603
Filed: January 13, 2014
For: Programmable Communicator

Group No.: 2682
Examiner: Nguyen, Nam V.

Mail Stop Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF PAYMENT OF ISSUE FEE (37 C.F.R. § 1.311)

- 1. Applicant hereby pays the issue fee for the attached Issue Fee Transmittal PTOL-85.
- 2. Applicant
 - A. Asserted small entity status in this application on January 13, 2014 by payment of the basic filing fee as a small entity. (37 C.F.R. § 1.27(c)(3))

It is confirmed that small entity status for this application has been checked and it is still in effect and is being asserted.
 - B. Applicant hereby asserts small entity status for this application.

3. Fee (Issue):

Application status is small business entity with a utility fee of \$480.00.

4. Total Fees Due

The total amount of fees due is:

Issue fee	\$480.00
TOTAL FEE(S) DUE	<u>\$480.00</u>

7. Assignee's Name and Address To Be Printed On Patent is as follows (37 C.F.R. § 3.81):

Name of Assignee: M2M Solutions LLC
 Address: Camden House, School Lane
 Residence (City and State or Country): Tiddington, Statford-Upon-Avon, United Kingdom

Assignee category or categories (not printed on patent): Corporation or other private group entity

8. Payment of total fee due:

Authorization is hereby made to charge the amount of \$480.00 to Deposit Account No. 19-4972.

Charge any additional fees required by this paper or credit any overpayment in the manner authorized above.

Date: August 22, 2014

/Robert M. Asher, #30,445/

Robert M. Asher

Registration No. 30,445

SUNSTEIN KANN MURPHY & TIMBERS LLP

125 Summer Street

Boston, MA 02110-1618

617-443-9292

Customer No. 02101

03781/01016 2159281.1

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
 Commissioner for Patents
 P.O. Box 1450
 Alexandria, Virginia 22313-1450
 or Fax (571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

2101 7590 08/11/2014
Sunstein Kann Murphy & Timbers LLP
 125 SUMMER STREET
 BOSTON, MA 02110-1618

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

_____ (Depositor's name)
_____ (Signature)
_____ (Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/169,603	01/31/2014	Eveline Wesby-van Swaay	3781/1016	7068

TITLE OF INVENTION: Programmable Communicator

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$480	\$0	\$0	\$480	11/12/2014

EXAMINER	ART UNIT	CLASS-SUBCLASS
NGUYEN, NAM V	2682	340-539120

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
 Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
 "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
 (1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
 (2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Sunstein Kann Murphy
 2 & Timbers LLP
 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: M2M Solutions LLC
 (B) RESIDENCE: (CITY and STATE OR COUNTRY) Tiddington, Stratford-upon-Avon, United Kingdom

Please check the appropriate assignee category or categories (will not be printed on the patent): Individual Corporation or other private group entity Government

4a. The following fee(s) are submitted:
 Issue Fee
 Publication Fee (No small entity discount permitted)
 Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)
 A check is enclosed.
 Payment by credit card. Form PTO-2038 is attached.
 The Director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number 19-4972 (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)
 Applicant certifying micro entity status. See 37 CFR 1.29
 Applicant asserting small entity status. See 37 CFR 1.27
 Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
 NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
 NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Robert M. Asher, #30,445/ Date August 22, 2014
 Typed or printed name Robert M. Asher Registration No. 30,445

Electronic Patent Application Fee Transmittal

Application Number:	14169603
Filing Date:	31-Jan-2014
Title of Invention:	Programmable Communicator
First Named Inventor/Applicant Name:	Eveline Wesby-van Swaay
Filer:	Robert Asher
Attorney Docket Number:	3781/1016

Filed as Small Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl Issue Fee	2501	1	480	480

Extension-of-Time:

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Total in USD (\$)				480

Electronic Acknowledgement Receipt

EFS ID:	19936696
Application Number:	14169603
International Application Number:	
Confirmation Number:	7068
Title of Invention:	Programmable Communicator
First Named Inventor/Applicant Name:	Eveline Wesby-van Swaay
Customer Number:	2101
Filer:	Robert Asher
Filer Authorized By:	
Attorney Docket Number:	3781/1016
Receipt Date:	22-AUG-2014
Filing Date:	31-JAN-2014
Time Stamp:	13:06:00
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$480
RAM confirmation Number	9416
Deposit Account	194972
Authorized User	

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	klw3781_1016_IssueFee.pdf	189795 28d689f0ca15789bb178962cc4416d8f4b9ab6a6	no	3

Warnings:

Information:

2	Fee Worksheet (SB06)	fee-info.pdf	30079 b95434eea0239731a02729587d5224acd34c54d8	no	2
---	----------------------	--------------	---	----	---

Warnings:

Information:

Total Files Size (in bytes): 219874

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Eveline Wesby-van Swaay
Application No.: 14/169,603
Filed: 01/31/2014
For: Programmable Communicator

Group No.: 2682
Examiner: Nguyen, Nam V.

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

LETTER ACCOMPANYING AMENDMENT AFTER ALLOWANCE
(37 C.F.R. § 1.312)

1. Please make the amendments or consider the items shown in the attached papers in this application in the claims.
2. Type of amendment:

Correction of formal matters

As shown in the remarks of the attached paper, these (1) are needed for proper disclosure or protection of the invention and (2) require no substantial amount of additional work on the part of the PTO.
3. The issue fee has not been paid.
4. Additional Fees

For any additional fees that may be required by the filing of this paper please charge Deposit Account No. 19-4972.

Date: August 15, 2014

/Jonathan C. Lovely, #60,821/

Jonathan C. Lovely
Registration No. 60,821
SUNSTEIN KANN MURPHY & TIMBERS LLP
125 Summer Street
Boston, MA 02110-1618
US
617-443-9292
Customer No. 02101

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Wesby-van Swaay	Att’y Docket:	3781/1016
Appln. No.:	14/169,603	Filing Date:	January 31, 2014
Customer No.:	02101	Conf. No.:	7068
Examiner:	Nguyen, Nam V.	Art Unit:	2682
Invention:	PROGRAMMABLE COMMUNICATOR		

VIA USPTO ELECTRONIC FILING SYSTEM

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT AFTER ALLOWANCE UNDER 37 C.F.R. § 1.312

Dear Sir:

Pursuant to 37 C.F.R. 1.312, Applicant respectfully submits this amendment following the Notice of Allowance dated August 11, 2014, on or before payment of the issue fee:

Amendments to the Claims are reflected in the listing of claims which begins on page 2 of this paper.

Remarks begin on page 7 of this paper.

LISTING OF THE CLAIMS

1. (Currently Amended) A programmable communicator device comprising:

a programmable interface for establishing a communication link with at least one monitored technical device; and

a processing module for authenticating one or more wireless transmissions sent from a programming transmitter and received by the programmable communicator device by determining if at least one transmission contains a coded number;

wherein the programmable communicator device is configured to use a memory to store at least one ~~telephone number~~ or internet protocol (IP) address included within at least one of the one or more transmissions as one or more stored ~~telephone numbers~~ or IP addresses if the processing module authenticates the at least one of the one or more transmissions including the at least one ~~telephone number~~ or IP address and the coded number by determining that the at least one of the one or more transmissions includes the coded number, the one or more stored ~~telephone numbers~~ or IP addresses being addresses numbers to which the programmable communicator device is configured to and permitted to send outgoing wireless transmissions;

wherein the programmable communicator device is configured to use an identity module for storing a unique identifier that is unique to the programmable communicator device;

wherein the programmable communicator device is configured to process data received through the programmable interface from the at least one monitored technical device in response to programming instructions received in an incoming wireless packet switched data message;

wherein the programmable communicator is configured to send the processed data by General Packet Radio Service (GPRS), or other wireless packet switched data message; and

wherein the programmable communicator is configured to be incorporated into the at least one monitored technical device such that it becomes an integrated part of the monitored technical device.

2. (Original) A programmable communicator device according to claim 1, wherein the programmable communicator device comprises the identity module.
3. (Previously Presented) A programmable communicator device according to claim 1 further configured to receive additional wireless transmissions compliant with Bluetooth wireless air interface standards.
4. (Original) A programmable communicator device according to claim 1 further configured to request that an at least one monitored technical device send data through the programmable interface for processing by the programmable communicator device.
5. (Original) A programmable communicator device according to claim 1 further configured to transmit the processed data to an at least one monitoring device.
6. (Original) A programmable communicator device according to claim 5, wherein the processing module is configured to cause the processed data to be transmitted to the at least one monitoring device.
7. (Original) A programmable communicator device according to claim 1 further configured to determine whether the processed received data indicates a change in status of the at least one monitored technical device that crosses a threshold parameter, or that otherwise indicates an alarm condition.
8. (Original) A programmable communicator device according to claim 7 further configured to send an at least one transmission for alerting an at least one monitoring device of said change in status or other alarm condition.
9. (Original) A programmable communicator device according to claim 1 further configured to request that an at least one monitored technical device send data through the programmable interface for receipt by the programmable communicator device.

10. (Original) A programmable communicator device according to claim 1 further configured to transmit the received data to an at least one monitoring device either periodically or in response to a change in status of at least one monitored technical device or in response to a data request initiated by the monitoring device.

11. (Original) A programmable communicator device according to claim 10, wherein the processing module is configured to cause the received data to be transmitted to the at least one monitoring device.

12. (Original) A programmable communicator device according to claim 1 further configured to receive data from a location processing module configured to determine an at least one location of the programmable communicator device, and wherein the programmable communicator device is configured to cause the received data to be transmitted to the at least one monitoring device.

13. (Original) A programmable communicator device according to claim 12 wherein the location processing module comprises a Global Positioning System (GPS) module.

14. (Original) A programmable communicator device according to claim 1 wherein the monitored technical device is a sensor device.

15. (Original) A programmable communicator device according to claim 14 wherein the sensor device is attached to or integrated with an article of clothing, the article of clothing including at least one selected from the group consisting of a jacket, a ski jacket, and a life vest.

16. (Original) A programmable communicator device according to claim 14 further configured to be integrated with at least one sensor device to form a smart clothes device.

17. (Original) A programmable communicator device according to claim 1 wherein the monitored technical device is a health monitoring system.

18. (Original) A programmable communicator device according to claim 17 wherein the programmable communicator device is configured to receive data from the health monitoring system through the programmable interface representing at least one of body temperature, blood pressure, periodic or continuous electrocardiogram heart rhythm, blood glucose concentration, blood electrolyte concentration, kidney function, liver function, and labor contractions.

19. (Original) A programmable communicator device according to claim 1 wherein the monitored technical device is a vending machine.

20. (Original) A programmable communicator device according to claim 1 wherein the monitored technical device is a home or domestic appliance.

21. (Original) A programmable communicator device according to claim 20 wherein the home or domestic appliance is a washing machine or a sauna heater.

22. (Original) A programmable communicator device according to claim 1 wherein the monitored technical device is at least one of a door status monitoring device, a window status monitoring device, a proximity detector device, and a fire alarm device.

23. (Original) A programmable communicator device according to claim 1 wherein the monitored technical device is at least one of a pressure sensitive means, a heat sensitive means, a mechanical displacement means, and a water sensitive means.

24. (Original) A programmable communicator device according to claim 1 further configured to send data to and/or receive data from an Internet web page.

25. (Original) A programmable communicator device according to claim 1 further configured to communicate with a central communications point in the network.

26. (Original) A programmable communicator device according to claim 1 further configured to process and send at least one of electrical power data and water pressure data.

27. (Cancelled)

28. (Original) A programmable communicator device according to claim 1 further configured to process data from sensors on a bicycle.

29. (Original) A programmable communicator device according to claim 1 further configured to be reprogrammed with communications applications received over a wireless connection.

30. (Original) A programmable communicator device according to claim 1 further configured to communicate with one or more technical devices via Bluetooth packet switched messages or other wireless packet switched messages.

REMARKS

Applicant greatly appreciates the Examiner's Notice of Allowance. Claim 1 is being amended to remove the phrase "telephone number." This amendment narrows the claims by limiting the claim to receiving transmissions containing IP addresses, and storing IP addresses (e.g., as opposed to telephone numbers or IP addresses). This amendment also more accurately depicts the claimed subject matter. No new matter has been added.

Applicant does not believe that any extension of time is required. However, if an extension of time is required, please charge the associated fee and any additional fees required by this paper or credit any overpayment to deposit account number 19-4972. Applicant also requests that the examiner contact applicant's attorney, Jonathan Lovely, if it will assist in processing this application through issuance.

DATE: August 15, 2014
Sunstein Kann Murphy & Timbers LLP
125 Summer Street
Boston, MA 02110-1618
(617) 443-9292
03781/01016 2155273.1

Respectfully submitted,
Jonathan C. Lovely, #60,821/
Jonathan C. Lovely
Registration No. 60,821
Attorney for Applicant

Electronic Acknowledgement Receipt

EFS ID:	19875558
Application Number:	14169603
International Application Number:	
Confirmation Number:	7068
Title of Invention:	Programmable Communicator
First Named Inventor/Applicant Name:	Eveline Wesby-van Swaay
Customer Number:	2101
Filer:	Jonathan Lovely
Filer Authorized By:	
Attorney Docket Number:	3781/1016
Receipt Date:	15-AUG-2014
Filing Date:	31-JAN-2014
Time Stamp:	13:03:05
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment after Notice of Allowance (Rule 312)	DD37811016AfterAllowanceAmendment.pdf	151828 <small>38326b4daf22fa758c01f6181ff8edba08e2806d</small>	no	8

Warnings:

Information:

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



NOTICE OF ALLOWANCE AND FEE(S) DUE

2101 7590 08/11/2014
Sunstein Kann Murphy & Timbers LLP
125 SUMMER STREET
BOSTON, MA 02110-1618

Table with 2 columns: EXAMINER (NGUYEN, NAM V), ART UNIT (2682), PAPER NUMBER (7068)

DATE MAILED: 08/11/2014

Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO.

14/169,603 01/31/2014 Eveline Wesby-van Swaay 3781/1016 7068

TITLE OF INVENTION: Programmable Communicator

Table with 7 columns: APPLN. TYPE, ENTITY STATUS, ISSUE FEE DUE, PUBLICATION FEE DUE, PREV. PAID ISSUE FEE, TOTAL FEE(S) DUE, DATE DUE

nonprovisional SMALL \$480 \$0 \$0 \$480 11/12/2014

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
 Commissioner for Patents
 P.O. Box 1450
 Alexandria, Virginia 22313-1450
 or Fax (571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

2101 7590 08/11/2014
Sunstein Kann Murphy & Timbers LLP
 125 SUMMER STREET
 BOSTON, MA 02110-1618

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/169,603	01/31/2014	Eveline Wesby-van Swaay	3781/1016	7068

TITLE OF INVENTION: Programmable Communicator

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$480	\$0	\$0	\$480	11/12/2014

EXAMINER	ART UNIT	CLASS-SUBCLASS
NGUYEN, NAM V	2682	340-539120

<p>1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).</p> <p><input type="checkbox"/> Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.</p> <p><input type="checkbox"/> "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a Customer Number is required.</p>	<p>2. For printing on the patent front page, list</p> <p>(1) The names of up to 3 registered patent attorneys or agents OR, alternatively, _____ 1</p> <p>(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. _____ 2</p> <p>_____ 3</p>
---	---

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE _____ (B) RESIDENCE: (CITY and STATE OR COUNTRY) _____

Please check the appropriate assignee category or categories (will not be printed on the patent) : Individual Corporation or other private group entity Government

<p>4a. The following fee(s) are submitted:</p> <p><input type="checkbox"/> Issue Fee</p> <p><input type="checkbox"/> Publication Fee (No small entity discount permitted)</p> <p><input type="checkbox"/> Advance Order - # of Copies _____</p>	<p>4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)</p> <p><input type="checkbox"/> A check is enclosed.</p> <p><input type="checkbox"/> Payment by credit card. Form PTO-2038 is attached.</p> <p><input type="checkbox"/> The Director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).</p>
---	--

5. **Change in Entity Status** (from status indicated above)

Applicant certifying micro entity status. See 37 CFR 1.29

Applicant asserting small entity status. See 37 CFR 1.27

Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO.
14/169,603 01/31/2014 Eveline Wesby-van Swaay 3781/1016 7068

2101 7590 08/11/2014
Sunstein Kann Murphy & Timbers LLP
125 SUMMER STREET
BOSTON, MA 02110-1618

EXAMINER

NGUYEN, NAM V

ART UNIT PAPER NUMBER

2682

DATE MAILED: 08/11/2014

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)

(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 14/169,603	Applicant(s) WESBY-VAN SWAAY, EVELINE	
	Examiner NAM V. NGUYEN	Art Unit 2682	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. This communication is responsive to 6/13/14.
 A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.
2. An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. The allowed claim(s) is/are 1-26 and 28-30. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/oph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

- a) All b) Some *c) None of the:
1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. <input type="checkbox"/> Notice of References Cited (PTO-892) 2. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date <u>7/23/14</u> 3. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material 4. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. | <ol style="list-style-type: none"> 5. <input type="checkbox"/> Examiner's Amendment/Comment 6. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance 7. <input type="checkbox"/> Other _____. |
|--|--|

/NAM V NGUYEN/
Primary Examiner, Art Unit 2682

Art Unit: 2682

Allowable Subject Matter

This communication is in response to applicant's amendment which is filed June 13, 2014 in the application of Van Swaay for a "programmable communicator" filed January 31, 2014.

The proposed amendment has been entered and made of record.

Claim 27 has been cancelled.

Regarding the information disclosure statement (IDS) submitted on July 23, 2014, the submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner. However, some documents in the IDS do not includes the date have been cross out (or not considered).

Applicant submits five Terminal Disclaimers to overcome the rejection of the Claims Under the Doctrine of Double Patenting. The Terminal Disclaimers are approved on July 29, 2014. Therefore, examiner withdraws the Double Patenting rejections.

Claims 1-26 and 28-30 are allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

Art Unit: 2682


fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nam V Nguyen whose telephone number is 571-272-3061. The examiner can normally be reached on Mon-Fri, 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, George Bugg can be reached on 571- 272-2998. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/NAM V NGUYEN/
Primary Examiner, Art Unit 2682

Search Notes 	Application/Control No. 14169603	Applicant(s)/Patent Under Reexamination WESBY-VAN SWAAY, EVELINE
	Examiner NAM V NGUYEN	Art Unit 2682

CPC- SEARCHED		
Symbol	Date	Examiner
HO4M 3/00	8/6/14	NN


CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner
H04Q 7/200; H04Q 1/30; G08B 1/08;	8/6/14	NN

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
340	7.29; 7.33; 7.52; 529.12; 573.4; 693.5	3/7/14	NN
455	456; 456.2; 418; 419; 425	3/7/14	NN
379	142; 373; 375	3/7/14	NN

SEARCH NOTES		
Search Notes	Date	Examiner
Search EAST: USPAT; US-PUB; EPO; JPO; and Derwent.	3/7/14	NN
Search TERMS: authorized list caller in cellular phone with monitoring device; sensor; monitoring central station with address/code/number/id code/IP address or phone number.	3/7/14	NN
Updated search from CONTINUATION APPLICATIONS	3/7/14	NN
Updated search.	8/6/14	NN

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
SAME AS	ABOVE	8/6/14	NN


	.N.V.N./ Primary Examiner.Art Unit 2682
--	--

Issue Classification 	Application/Control No. 14169603	Applicant(s)/Patent Under Reexamination WESBY-VAN SWAAY, EVELINE	
	Examiner NAM V NGUYEN	Art Unit 2682	

CPC						
Symbol					Type	Version
H04W		4		001	F	2013-01-01
H04W		4		12	I	2013-01-01
H04M		1		677	I	2013-01-01
H04M		1		7253	I	2013-01-01
H04M		1		663	I	2013-01-01
H04M		1		72563	I	2013-01-01
H04M		1		72547	A	2013-01-01
H04M		2250		02	A	2013-01-01
H04W		4		16	I	2013-01-01
H04W		12		06	I	2013-01-01
H04M		1		275	I	2013-01-01
H04M		1		72538	I	2013-01-01
H04M		1		6775	A	2013-01-01
H04M		1		2535	A	2013-01-01
H04W		8		22	I	2013-01-01
H04M		1		05	I	2013-01-01


CPC Combination Sets				
Symbol	Type	Set	Ranking	Version

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	29	
/NAM V NGUYEN/ Primary Examiner.Art Unit 2682	8/6/14	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

Issue Classification 	Application/Control No. 14169603	Applicant(s)/Patent Under Reexamination WESBY-VAN SWAAY, EVELINE
	Examiner NAM V NGUYEN	Art Unit 2682

US ORIGINAL CLASSIFICATION				INTERNATIONAL CLASSIFICATION							
CLASS		SUBCLASS		CLAIMED				NON-CLAIMED			
340		7.29		H	0	4	M	3 / 00 (2006.01.01)			
CROSS REFERENCE(S)				H	0	4	Q	1 / 30 (2006.01.01)			
				G	0	8	B	1 / 08 (2006.01.01)			
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)										
340	7.33	7.52									

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	29	
/NAM V NGUYEN/ Primary Examiner.Art Unit 2682	8/6/14	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

Issue Classification 	Application/Control No. 14169603	Applicant(s)/Patent Under Reexamination WESBY-VAN SWAAY, EVELINE
	Examiner NAM V NGUYEN	Art Unit 2682

<input type="checkbox"/> Claims renumbered in the same order as presented by applicant		<input type="checkbox"/> CPA		<input type="checkbox"/> T.D.		<input type="checkbox"/> R.1.47									
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1	17	17												
2	2	18	18												
3	3	19	19												
4	4	20	20												
5	5	21	21												
6	6	22	22												
7	7	23	23												
8	8	24	24												
9	9	25	25												
10	10	26	26												
11	11		27												
12	12	27	28												
13	13	28	29												
14	14	29	30												
15	15														
16	16														

NONE		Total Claims Allowed:	
		29	
(Assistant Examiner)	(Date)	O.G. Print Claim(s)	O.G. Print Figure
/NAM V NGUYEN/ Primary Examiner.Art Unit 2682	8/6/14	1	1
(Primary Examiner)	(Date)		

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Eveline Wesby-van Swaay

Application No.: 14/169,603

Art Unit/Group No.: 2682

Filing Date: January 31, 2014

Examiner: Nam V. Nguyen

Conf. No.: 7068

For: PROGRAMMABLE COMMUNICATOR

Mail Stop Amendment

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

List of Sections Forming Part of This Supplemental Information Disclosure Statement

The following sections are being submitted for this Supplemental Information Disclosure Statement:

1. Preliminary Statements
2. Forms PTO/SB/08A and 08B (substitute for Form PTO-1449)
3. Statement as to Information Not Found in Patents or Publications
4. Identification of Prior Application in Which Listed Information Was Already Cited and for Which No Copies Are Submitted or Need Be Submitted
5. Cumulative Patents or Publications
6. Copies of Listed Information Items Accompanying This Statement
7. Concise Explanation of Non-English Language Listed Information Items
 - 7A. International Search Report
 - 7B. English Language Version of International Search Report
8. Translation(s) of Non-English Language Documents
9. Concise Explanation of English Language Listed Information Items (Optional)
10. Identification of Person(s) Making This Supplemental Information Disclosure Statement

Section 1. Preliminary Statements

Applicants submit herewith patents, publications or other information, of which they are aware that they believe may be material to the examination of this application, and in respect of which, there may be a duty to disclose.

The filing of this supplemental information disclosure statement shall not be construed as a representation that a search has been made (37 C.F.R. § 1.97(g)), an admission that the information cited is, or is considered to be, material to patentability, or that no other material information exists.

The filing of this supplemental information disclosure statement shall not be construed as an admission against interest in any manner. *Notice of January 9, 1992, 1135 O.G. 13-25, at 25.*

(Supplemental Information Disclosure Statement—Page 2 of 31)

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /N.N./

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

U.S. PATENT DOCUMENTS					
Examiner Initials	Reference Number	Document Number	Issue Date	Inventor	Class/ Subclass
	HX	US 5,689,825 A	Nov. 18, 1997	Averbuch et al.	455/89
	HY	US 5,699,513 A	Dec. 16, 1997	Feigen et al.	395/187.01
	HZ	US 5,901,320 A	May 4, 1999	Takahashi et al.	395/712
	IA	US 5,922,074 A	Jul. 13, 1999	Richard et al.	713/200
	IB	US 5,983,350 A	Nov. 9, 1999	Minear et al.	713/201
	IC	US 6,108,531 A	Aug. 22, 2000	Berg et al.	455/408
	ID	US 6,327,466 B1	Dec. 4, 2001	Savolainen	455/407
	IE	US 6,377,577 B1	Apr. 23, 2002	Bechtolsheim et al.	370/392
	IF	US 6,388,612 B1	May 14, 2002	Neher	342/357.07
	IG	US 6,396,416 B1	May 28, 2002	Kuusela et al.	340/870.28
	IH	US 6,463,474 B1	Oct. 8, 2002	Fuh et al.	709/225
	II	US 6,671,522 B1	Dec. 30, 2003	Beaudou	455/558
	IJ	US 6,751,452 B1	Jun. 15, 2004	Kupczyk et al.	455/345

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Reference Number	Country Code	Document Number	Publication Date	Patentee or Applicant	Class/ Subclass
	IK	EP	0 459 344 A1	Dec. 4, 1991	Alcatel CIT	H04Q 7/04
	IL	EP	0 459 344 A1 [English Abstract]	Dec. 4, 1991	Alcatel CIT	H04Q 7/04
	IM	CA	1,296,068 C	Feb. 18, 1992	Friesen	A61B 5/00
	IN	EP	0 632 629 A1	Jan. 4, 1995	Multi-Tech Systems, Inc.	H04L 29/06
	IO	WO	96/42175 A1	Dec. 27, 1996	NE-Products OY	H04Q 7/22

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Reference Number	Country Code	Document Number	Publication Date	Patentee or Applicant	Class/ Subclass
	IP	WO	97/16938 A1	May 9, 1997	Nokia Telecommunications OY	H04Q 7/32
	IQ	EP	0 804 046 A2	Oct. 29, 1997	Nokia Mobile Phones Ltd.	H04Q 7/32
	IR	GB	2 313 519 A	Nov. 26, 1997	Motorola GmbH	H04Q 7/32
	IS	WO	98/38820 A2	Sep. 3, 1998	Telefonaktiebolaget LM Ericsson	H04Q 7/22
	IT	WO	99/20070 A2	Apr. 22, 1999	NE-Products OY	H04Q 7/38
	IU	WO	99/57875 A2	Nov. 11, 1999	NE-Products OY	H04M 3/42
	IV	WO	00/17021 A1	Mar. 30, 2000	Van Bergen	B60R 25/04
	IW	EP	0 996 299 A1	Apr. 26, 2000	Société Francaise du Radiotéléphone SRF	H04Q 7/22
	IX	WO	01/35686 A1	May 17, 2001	Wavecom	H04Q 7/32
	IY	WO	01/35686 A1 [English Abstract]	May 17, 2001	Wavecom	H04Q 7/32

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	IZ		Lyhenteiden Ju Merkkien Selitykset, 57 pages
	JA		Legends of Abbreviations and Symbols, 57 pages (January, 2014) [English Translation]
	JB		Modbus/BSAP Configuration, 2 pages
	JC		Photo of METHOD Localization objects, 8604, 1 page
	JD	3GPP (3 rd Generation Partnership Project)	3 rd Generation Partnership Project; Technical Specification Group Services and System Aspects; International Mobile station Equipment Identities (IMEI) (Release 9), Version 9.0.0, 8 pages (September, 2009) 3GPP – TS 22.016
	JE	3GPP (3rd Generation Partnership Project)	The Mobile Broadband Standard, 3GPP Specification detail, Specification of the Subscriber Identity Module – Mobile Equipment (SIM-ME) Interface, 4 pages, 3GPP TS 11.11
	JF	3GPP (3 rd Generation Partnership Project)	The Mobile Broadband Standard, 3GPP Specification detail, General Packet Radio Service (GPRS); Service description; Stage 2, 3 pages (April, 2014) 3GPP TS 03.60
	JG	AirLink Communications, Inc.	“AirLink Communications Releases New Wireless ACE,” 1 page (April, 1998)
	JH	AirLink Communications, Inc.	AirLink News / CDPD in the News, 1 page (December, 1998) (http://www.archive.org/web/19981212022616/http://www.airlink.com)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	JI	AirLink Communications, Inc.	CDPD Raven, Raven Brochure, 2 pages (January, 1999) (http://www.archive.org/web/19990117024728/http://www.airlink.com/info/rav_mkt.html)
	JJ	AirLink Communications, Inc.	Airlink Raven/PinPoint CDPD Modem, User's Manual, 68 pages (February, 1999)
	JK	AirLink Communications, Inc.	PinPoint Vehicle Installation Guide, 6 pages (February, 2000)
	JL	AirLink Communications, Inc.	Raven Installation Guide, 8 pages (May, 2000)
	JM	AirLink Communications, Inc.	Wireless ACE Release Notes: "7/12/00 – ACE version 1.50," 3 pages (August, 2000)
	JN	AirLink Communications, Inc.	Proven Wireless Solutions, Intelligent Transportation System (ITS) Applications, 1 page (February, 2001)
	JO	AirLink Communications, Inc.	Proven Wireless Solutions, Telemetry Applications, 1 page (February, 2001)
	JP	AirLink Communications, Inc.	Press Release: "AirLink Announces New Raven II CDPD Modem," 1 page (April, 2001)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
Serial No: 14/169,603 Art Group Unit: 2682
Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
Conf. No.: 7068
Invention: Programmable Communicator
Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	JQ	AirLink Communications, Inc.	Press Release: "AirLink Communications & Novatel Wireless Enforce Better Communications for the Tampa Police Department," 2 pages (May, 2001)
	JR	AirLink Communications, Inc.	ACE Release Notes: "7/26/02 - ACE version 1.80.15," 5 pages (October, 2002)
	JS	AirLink Communications, Inc.	AirLink CDPD Modem AT Commands, Quick Reference, 24 pages (October, 2002)
	JT	AirLink Communications, Inc.	Raven Firmware Release Notes: "January 25, 2002 Raven II Release 200201D," 2 pages (October, 2002)
	JU	AirLink Communications, Inc.	Wireless ACE, User's Manual, 48 pages (December, 2002)
	JV	Auerbach	Handbook of Local Area Networks 1999, 67 pages (1996)
	JW	BioPhone	BIOPHONE 3502u, Instruction & Troubleshooting Manual, 149 Pages (May, 1978)
	JX	BioPhone	Photos of BIOPHONE Model 3502. 5 pages
	JY	Blasch et al.	"Georgia Tech Aerial Robotics System Competition Entry," <i>Georgia Institute of Technology School of Aerospace</i> , 10 pages (March, 1994)
	JZ	CDPD Forum, Inc.	"Circuit Switched - Cellular Digital Packet Data," Part 1024, Release 1.5, 90 pages (June, 1995)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	KA	CDPD Forum, Inc.	"CS CDPD Modem Bank Management Protocol (MBMP)," Part 1025, Release 1.5, 48 pages (June, 1995)
	KB	CDPD Forum, Inc.	"CS CDPD Accounting Service and Protocol," Part 1026, Release 1.5, 20 pages (June, 1995)
	KC	Eagle Cross	"For Cellular Data Transmission, It's Either THE OUTBACK or This," 4 pages
	KD	Davies	"A Brief History of Cryptography," <i>Information Security Technical Report</i> , Vol. 2, No. 2, pp. 14-17 (1997)
	KE	DeRose	"The Wireless Data Handbook," 4 th Edition, 399 pages (1999)
	KF	Doelz et al.	"Binary Data Transmission Techniques for Linear Systems*," <i>Proceedings of the IRE</i> , pp. 656-661 (May, 1957)
	KG	Electronic Compliance Laboratories, Inc.	EMI Test Report on Symphony ISA Card; Prepared for Proxim, Test Report No. A806003, 42 pages (June, 1998)
	KH	European Telecommunications Standards Institute (ETSI)	<i>Release Note: Recommendation GSM 02.16, International MS Equipment Identities, European digital cellular telecommunication system (phase 1); GSM Technical Specification, Version 3.0.1, 9 pages (February, 1992)</i>

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	KI	European Telecommunications Standards Institute (ETSI)	<i>GSM Technical Specification: Digital cellular telecommunications system (Phase 2+); Physical Layer on the radio path; General description (GSM 05.01, version 5.0.0), 20 pages (May, 1996) Reference: TS/SMG-020501Q</i>
	KJ	European Telecommunications Standards Institute (ETSI)	<i>Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Service description Stage 2 (GSM 03.60, version 6.3.2, Release 1997), 107 pages (July, 1997) EN 301 344</i>
	KK	European Telecommunications Standards Institute (ETSI)	<i>GSM Technical Specification – Digital cellular telecommunications system (Phase 2+); Use of Data Terminal Equipment - Data Circuit terminating; Equipment (DTE - DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS) (GSM 07.05, version 5.5.0, Release 1998), 69 pages (January, 1998) Reference: GTS/SMG-040705QR</i>
	KL	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+); Specification of the SIM Application Toolkit for the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface (GSM 11.14, version 7.3.0, Release 1998) 101 pages, (July, 1999) TS 101 267</i>

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	KM	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+); Mobile Stations (MS) features (GSM 02.07, version 6.1.0, Release 97), 22 pages (July, 1998) TS 100 906</i>
	KN	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+); Security Mechanisms for the SIM application toolkit; Stage 2 (GSM 03.48, version 6.1.0, Release 97), 20 pages (July, 1998) TS 101 181</i>
	KO	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+); Specification of the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface (GSM 11.11, version 6.1.0, Release 1997), 125 pages (July, 1998) TS 100 977</i>
	KP	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+); Specification of the SIM Application Toolkit for the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface (GSM 11.14, version 7.1.0, Release 1998), 98 pages (November, 1998)</i>

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	KQ	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+); Security Mechanisms for the SIM application toolkit; Stage 2 (GSM 03.48, version 7.0.1, Release 1998), 21 pages (July, 1999) ETSI TS 101 181</i>
	KR	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Mobile Station (MS) supporting GPRS (GSM 07.60, version 7.0.0, Release 1998), 47 pages (July, 1999) ETSI TS 101 356</i>
	KS	European Telecommunications Standards Institute (ETSI)	<i>Technical specification: Digital cellular telecommunications system (Phase 2+); AT command set for GSM Mobile Equipment (ME) (GSM 07.07, version 7.3.0, Release 1998), 125 pages (July, 1999) ETSI TS 100 916</i>
	KT	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+); GSM Release 1999 Specifications (GSM 01.01, version 0.4.0, Release 1999), 22 pages (October, 1999)</i>
	KU	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+); GSM Release 1999 Specifications (GSM 01.01, version 1.0.0, Release 1999), 23 pages (November, 1999)</i>

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	KV	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+); Subscriber Identity Module Application Programming Interface (SIM API); SIM API for Java Card™; Stage 2 (GSM 03.19, version 7.0.0, Release 1998), 22 pages (November, 1999) ETSI TS 101 476</i>
	KW	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+); AT command set for GSM Mobile Equipment (ME) (GSM 07.07, version 6.4.0, Release 1997), 116 pages (November, 1999) ETSI TS 100 916</i>
	KX	European Telecommunications Standards Institute (ETSI)	<i>Technical specification: Digital cellular telecommunications system (Phase 2+); AT command set for GSM Mobile Equipment (ME) (GSM 07.07, version 7.5.0, Release 1998), 127 pages (December, 1999) ETSI TS 100 916</i>
	KY	European Telecommunications Standards Institute (ETSI)	<i>Digital cellular telecommunications system (Phase 2+); AT command set for GSM Mobile Equipment (ME) (GSM 07.07, version 5.9.1, Release 1996), 98 pages (December, 1999) ETS 300 916</i>

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	KZ	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Use of Data Terminal Equipment – Data Circuit terminating; Equipment (DTE-DCE) interface for Cell Broadcast Service (CBS) (3G TS 27.005, version 3.1.0, Release 1999), 70 pages (January, 2000) ETSI TS 127 005</i>
	LA	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); AT command set for 3GPP User Equipment (UE) (3G TS 27.007, version 3.3.0, Release 1999), 147 pages (January, 2000) ETSI TS 127 007</i>
	LB	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); AT command set for 3GPP User Equipment (UE) (3G TS 27.007, version 3.4.0, Release 1999), 156 pages (March, 2000) ETSI TS 127 007</i>
	LC	European Telecommunications Standards Institute (ETSI)	<i>GSM Technical Specification: Digital cellular telecommunications system (Phase 2+); International Mobile station Equipment Identities (IMEI) (GSM 02.16, version 5.2.0, Release 1996), 12 pages (August, 2000) Reference: RGTS/SMG-010216QR2</i>

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Wesby-van Swaay	Attorney Docket:	3781/1016
Serial No:	14/169,603	Art Group Unit:	2682
Date Filed:	January 31, 2014	Examiner Name:	Nguyen, Nam V
		Conf. No.:	7068
Invention:	Programmable Communicator		
Date:	July 23, 2014		

**LIST OF PATENTS AND PUBLICATIONS FOR
APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	LD	Falcom GmbH	TANGO Hardware Description, Version 1.04, 50 pages
	LE	Falcom GmbH	EALCOM A2D Evaluation Kit, Short Form, Version 1.00, 2 pages
	LF	Falcom GmbH	EALCOM A2D-3, A2D-3IP3, A3D & A3D-IP3, User's Manual, Version 1.08, 69 pages
	LG	Falcom GmbH	EALCOM A2D (Including A2D A/B/C and A2D 1), Version 1.12, 94 pages
	LH	Falcom GmbH	FALCOM A2D-3, A2D-3IP3, A3D & A3DIP3 (Programming Manual), Version 1.17, 56 pages
	LI	Falcom	Alternative A2D3-GPS firmware, with more features and stability, Firmware revision 208, User Manual Revision DR0.11z, 25 pages (2001)
	LJ	Falcom	GSM Modul, GSM Modem und GSM Telefon für Daten, Fax, SMS und Sprache mit RS232, Falcom A2 GSM 900, 6 pages (January, 2014)
	LK	Falcom	GSM modul, GSM Modem and GSM phone for data, Fax, SMS and voice with RS232, Falcom A2 GSM 900, 6 pages (January, 2014) [English Translation]

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Wesby-van Swaay	Attorney Docket:	3781/1016
Serial No:	14/169,603	Art Group Unit:	2682
Date Filed:	January 31, 2014	Examiner Name:	Nguyen, Nam V
		Conf. No.:	7068
Invention:	Programmable Communicator		
Date:	July 23, 2014		

**LIST OF PATENTS AND PUBLICATIONS FOR
APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	LT	GPS Navstar	Global Positioning System, Standard Positioning Service Signal Specification, Second Edition, 51 pages (June, 1995)
	LU	GRAFIK Eye®	GRX-RS232 Interface Control, GRX-PRG Programming Interface, Class 2/PELV Devices, Installation and Operation Instructions, 4 pages (1999)
	LV	Harris Corp.	Photos of the RF-5000, 3 pages
	LW	Harris Corp. RF Communications Group	RF-5020 RT Maintenance Manual, 270 pages (October, 1991)
	LX	Hearst Electronics Products	"Wireless LAN adapter brings 1.6-Gbit/s connectivity to handheld PCs" Proxim, 1 page (May, 1997)
	LY	HomeRF	HomeRF: Bringing Wireless Connectivity Home, 27 pages (March, 1999)
	LZ	HomeRF	Interference Immunity of 2.4 Ghz Wireless LANs, 10 pages (2001)
	MA	HomeRF	A Comparison of Security in HomeRF versus IEEE802.11b, 7 pages (2001)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	MB	Hong Kong Awards	2013 Hong Kong Awards for Industry awarded Sierra the "Technological Achievement Certificate of Merit" for the AirPrime® WS6318 Embedded Wireless Module as the "world's smallest cellular module", 4 pages (http://www.sierrawireless.com/Newsroom/Awards/product_awards.aspx)
	MC	Hunkins	"Emergence of Consumer Solutions in Vehicle Telematics," <i>Telcontar</i> , 13 pages (December, 2003)
	MD	Intel	8251A Programmable Communication Interface, Order No. 205222-002, 25 pages (November, 1996)
	ME	Intermec Technologies Corporation	"5055 Data Collection PC, Technical Reference," Revision C, P/N 978-054-002, 194 pages (May, 2001)
	MF	International Telecommunication Union	<i>ITU-T: Telecommunication Standardization Sector of ITU, Data Communication over the Telephone Network, Serial Asynchronous Automatic Dialling and Control (V.25 ter)</i> , 74 pages (August, 1995)
	MG	Khletic	PC/Pirama™, Driving the Network Economy, Wireless Solutions for Mobile Operations, 2 pages
	MH	Korba	"Security System for Wireless Local Area Networks," <i>National Research Council of Canada</i> , pp. 1550-1554 (1998)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	MI	Kramer	“Cellular Combos Differ in Heft, Abilities - <i>Eagle Cross Device Is Fast but Heavy; PowerTek and Vital Offer Cheaper, Lighter Products,</i> ” <i>PC Week</i> , Vol. 8, No. 42, pp. 160-164 (October, 1991)
	MJ	Kyocera – North America	“Kyocera Wireless Corp. Announces New CDMA Module Product Line,” 2 pages (March, 2001)
	MK	Lexis Nexis	“Sierra Wireless Expands Data Product Line with New 3-Watt Telemetry Modem,” 2 pages (October, 1997)
	ML	Luhowy	“Advances In HF Parallel Tone Modem Technology,” Harris Corporation, RF Communications Group, 5 pages (1988)
	MM	Lutron®	“RF-Modem Installation for HomeWorks™,” Application Note #37, 6 pages (1997)
	MN	Lynch et al.	“Piezoelectric Structural Excitation using a Wireless Active Sensing Unit,” 9 pages
	MO	Lynch et al.	“The Design of a Wireless Sensing Unit for Structural Health Monitoring,” <i>Proc. of the 3rd Int. Workshop on Structural Health Monitoring, Stanford, CA</i> , 10 pages (September, 2001)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	MP	Medical Device & Diagnostic Industry Magazine	"Wireless Technologies Fine Niche in Patient Care," <i>Medical Device & Diagnostic Industry Magazine</i> , 11 pages (August, 1998)
	MQ	Mobile Merit Award	Mobile Merit Award for the "Mobile Health" category was awarded to Vgo for using the Novatel E362 (http://investor.novatelwireless.com/releasedetail.cfm?ReleaseID=668463) (2012)
	MR	Mobile Merit Award	Mobile Merit Award for the "Connected Life Category" was awarded to Novatel Wireless for its "SA 2100 M2M Device," 2 pages (2013) (http://investor.novatelwireless.com/releasedetail.cfm?ReleaseID=790042)
	MS	Myles et al.	"A Mobile Host Protocol Supporting Route Optimization and Authentication," <i>IEEE J. Sel. Area Comm.</i> , Vol. 13, No. 5, pp. 839-849 (June, 1995)
	MT	National Semiconductor	PC165550D Universal Asynchronous Receiver/Transmitter with FIFOs, 22 pages (June, 1995)
	MU	National Semiconductor	PC16450C/NS16450, PC8250A/INS8250A Universal Asynchronous Receiver/Transmitter, 18 pages (July, 1990)
	MV	Negus et al.	"HomeRF™. Wireless Networking for the Connected Home," 10 pages

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	MW	Negus et al.	"History of Wireless Local Area Networks (WLANs) In the Unlicensed Bands," <i>George Mason University Law School Conference, Information Economy Project, Arlington, VA</i> , pp. 1-13 (April, 2008)
	MX	Nokia	NOKIA PremiCell, Operator's Guide, 58 pages (December, 1997)
	MY	Nokia	Nokia Card Phone 1.0, 3 pages (June, 1997)
	MZ	Nokia	User's Guide, 22 pages (1998)
	NA	Nokia	Nokia Card Phone 2.0, 1 page (June, 1999)
	NB	Nokia	Nokia Card Phone; Quick guide for a Windows terminal window with the Nokia Card Phone 2.0, 6 pages (April, 2000)
	NC	Nokia	Nokia Card Phone; Support Guide for Using the Nokia Cardphone 2.0 in a Windows CE Device, Version 1.0, 9 pages (March, 2001)
	ND	Nokia	Nokia Premicell 18i, 2 pages (April, 2014)
	NE	Nomadic Corp.	"Mercury User's Guide," Version 2.3, 96 pages (1996)
	NF	Professional PC Companion	NEC MobilePro™ 780, 2 pages (April, 2000)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	NG	Proxim	Harmony™, Harmony OpenAir™ PC Card Datasheet, Rev. B, 2 pages (July, 2001)
	NH	Proxim	Harmony™, Harmony Access Point Controller Datasheet, Rev. B, 2 pages (June, 2002)
	NI	Proxim	Proxim Antennas and Accessories, Product Guide, Rev. B, 4 pages (January, 2000)
	NJ	Proxim	Symphony™; Create a Wireless Network for Your Home, Rev. A, 4 pages (September, 2001)
	NK	Proxim	Symphony-HRF Cordless Gateway; <i>Simple Reliable Home and Small Office Computer Networking Without Wires</i> , 2 pages (June, 2000)
	NL	Proxim	“Pediatric Software and ReangeLAN2™ Keep Pediatricians On The Move, <i>A Wireless LAN Case Study</i> ,” 2 pages (September, 1999)
	NM	Proxim	RangeLAN2: Extension Point Technical Guide; Configuring and using Extension Points in wireless LAN installations, <i>White Paper</i> , 16 pages (January, 1998)
	NN	Proxim	RangeLAN2™ Ethernet and Token Ring Access Points; <i>Wireless Mobile Access to Wired LAN Services</i> , Data Sheet, 2 pages (March, 1998)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	NO	Proxim, Inc.	RangeLAN2 7420 Series PC Card Wireless LAN Adaptor Product Information, 101 pages (2000)
	NP	Proxim	RangeLAN2/ISA, <i>Wireless LAN Adapter for ISA Bus Computers</i> , User's Guide, 65 pages (1993)
	NQ	Proxim	RangeLAN2 Model 7500, User's Guide, 72 pages (1993)
	NR	Proxim	"What is a Wireless LAN?", <i>White Paper</i> , 5 pages (March, 1998)
	NS	Proxim	RangeLAN2 Access Point Models 7510 and 752x, User's Guide, 103 pages (1999)
	NT	Proxim	RangeLAN2 Extension Point Models 7540 and 7541, User's Guide, 84 pages (1999)
	NU	Proxim	RangeLAN2™ 7910 Series Serial Adapter, <i>Enabling the Portability of RS-232 Devices</i> , Data Sheet, 2 pages (June 1999)
	NV	Proxim	RangeLAN2™ 7410 CE PC Card, <i>Mobilizing the Workforce with Handheld PCs</i> , Data Sheet, 2 pages (November, 1999)
	NW	Proxim	RangeLAN2™ 7110 PCI Card, Data Sheet, 2 pages (December, 1999)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	NX	Proxim	RangeLAN2™ 7420 Series PC Card, <i>Networking Laptops and Handhelds Without Wires</i> , Data Sheet, 2 pages (April, 2000)
	NY	Proxim	Case Study, Wlan Healthcare, Kadlec Medical Center, 1 page (2002)
	NZ	Proxim	Harmony Access Point Controller, User's Guide, 123 pages (2002)
	OA	Reiter et al.	"Data on The Go: Three Cellular Modems," <i>PC Magazine</i> , pp. 365-382 (December, 1990)
	OB	Savolainen	Solukkoverkon maksupuhelin, 64 pages (February, 2014)
	OC	Savolainen	Cellular Payphone, 64 pages (February, 2014) [English Translation]
	OD	Security Escort Training	"A Guide to assist you in estimating, installing, operating and maintaining Security Escort Systems," 142 pages
	OE	Sierra Wireless	"Sierra Wireless Combines Cellular Data, GPS; MP 200-GPS Modem Provides Both in a Single Package," <i>The Free Library</i> , 3 pages (January, 1997)
	OF	Sierra Wireless	MP215 Modem; Installation Configuration and User's Guide," Rev. 1.0, Part No. 2110036, 38 pages (June, 1998)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	OG	Sierra Wireless	SB300 OEM Modem, Product Specification, Rev. C, Part No. 2110049, Preliminary, 22 pages (July, 1998)
	OH	Sierra Wireless	MP200 Product Manual, Welcome to the MP200 Radio Modem, 2110026, Rev. 2.0, 84 pages (March, 2000)
	OI	Sierra Wireless	AirPrime SL9090 as the "Best Industrial M2M Wireless Module" <i>2012 Annual Best of Electric Design Awards</i> , 1 page (2012) (http://www.sierrawireless.com/Newsroom/Awards.aspx)
	OJ	Sierra Wireless	Photos of PocketPlus 210, 3 pages
	OK	Sierra Wireless	Enlarged Photo of DART 200 CDPD Modem, FCC ID: LL9CMIM01, 1 page
	OL	Sierra Wireless	Photo of DART 200 CDPD Modem, 1 page
	OM	Sierra Wireless	Photo of DART 200 CDPD Modem, FCC ID: LL9CMIM01, 1 page
	ON	Sierra Wireless	Photo of PocketPlus 211
	OO	Sierra Wireless	PocketPlus from Sierra Wireless, Previewing the Full-Featured Wireless Modem for the Mobile Computer User, 2 pages (1993)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	OP	Siemens	S25 User Guide, 64 pages (August, 1999)
	OQ	Siemens	Photos of Siemens M20 Terminal / Nokia PremiCell / Sensaphone 2000 / Novatel Wireless Technologies Ltd. Modem / Sierra Wireless SB300, 13 pages
	OR	SOMA Technology, Inc.	Philips® PageWriter Touch ECG, 5 pages (April, 2008)
	OS	Trimble, The GPS Solution	SVeeSix-CM3™, GPS Model for Embedded OEM, 2 pages (March, 1995)
	OT	Trimble Navigation	SV eeSix-CM3™, Embedded GPS Core Module, System Designer, Reference Manual, 246 pages (July, 1997)
	OU	Trimble Navigation Limited	<i>Lassen™ LP GPS – System Designer Reference Manual</i> , Part Number: 39264-00, Firmware: 7.82, 210 pages (August, 1999)
	OV	WaveCom	WM02 G900 / G1800 / G1900, GSM Modem, Version 1.0, 96 pages (May, 1999)
	OW	WaveLan	Company Overview, WaveLAN Competitive Bulletin, WaveLAN versus Proxim Range LAN, 6 pages
	OX	Verizon Wireless News Center	“Philadelphia Police Department Goes On-Line With Mobile Data Terminals in Vehicles, National Law Enforcement Week Marks Debut of New Weapon Ensuring Officer Safety, Efficiency,” 5 pages (May, 1997)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	OY	Connolly Bove Lodge & Hutz LLP and K&L Gates, LLP, <i>Counsel for Enfora, Inc.</i>	<i>Defendants Enfora, Inc. and Sierra Wireless America, Inc.'s Fourth Supplemental Invalidity Contentions</i> , M2M Solutions LLC v. Sierra Wireless America, Inc. and Sierra Wireless, Inc. et al. – U.S. District Court for the District of Delaware, Civil Action No. 12-030-RGA and 12-032-RGA, dated May 5, 2014 (22 pages)
	OZ	Connolly Bove Lodge & Hutz LLP and K&L Gates, LLP, <i>Counsel for Enfora, Inc.</i>	<i>Appendix MM - Defendants Enfora, Inc. and Sierra Wireless America, Inc.'s Fourth Supplemental Invalidity Contentions</i> , M2M Solutions LLC v. Sierra Wireless America, Inc. and Sierra Wireless, Inc. et al. – U.S. District Court for the District of Delaware, Civil Action No. 12-030-RGA and 12-032-RGA, dated May 5, 2014 (140 pages)
	PA	Connolly Bove Lodge & Hutz LLP and K&L Gates, LLP, <i>Counsel for Enfora, Inc.</i>	<i>Appendix NN - Defendants Enfora, Inc. and Sierra Wireless America, Inc.'s Fourth Supplemental Invalidity Contentions</i> , M2M Solutions LLC v. Sierra Wireless America, Inc. and Sierra Wireless, Inc. et al. – U.S. District Court for the District of Delaware, Civil Action No. 12-030-RGA and 12-032-RGA, dated May 5, 2014 (143 pages)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	PB	Connolly Bove Lodge & Hutz LLP and K&L Gates, LLP, <i>Counsel for Enfora, Inc.</i>	<i>Appendix OO - Defendants Enfora, Inc. and Sierra Wireless America, Inc.'s Fourth Supplemental Invalidity Contentions</i> , M2M Solutions LLC v. Sierra Wireless America, Inc. and Sierra Wireless, Inc. et al. – U.S. District Court for the District of Delaware, Civil Action No. 12-030-RGA and 12-032-RGA, dated May 5, 2014 (148 pages)
	PC	Connolly Bove Lodge & Hutz LLP and K&L Gates, LLP, <i>Counsel for Enfora, Inc.</i>	<i>Appendix PP - Defendants Enfora, Inc. and Sierra Wireless America, Inc.'s Fourth Supplemental Invalidity Contentions</i> , M2M Solutions LLC v. Sierra Wireless America, Inc. and Sierra Wireless, Inc. et al. – U.S. District Court for the District of Delaware, Civil Action No. 12-030-RGA and 12-032-RGA, dated May 5, 2014 (156 pages)
	PD	Connolly Bove Lodge & Hutz LLP and K&L Gates, LLP, <i>Counsel for Enfora, Inc.</i>	<i>Appendix QQ - Defendants Enfora, Inc. and Sierra Wireless America, Inc.'s Fourth Supplemental Invalidity Contentions</i> , M2M Solutions LLC v. Sierra Wireless America, Inc. and Sierra Wireless, Inc. et al. – U.S. District Court for the District of Delaware, Civil Action No. 12-030-RGA and 12-032-RGA, dated May 5, 2014 (82 pages)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Wesby-van Swaay	Attorney Docket:	3781/1016
Serial No:	14/169,603	Art Group Unit:	2682
Date Filed:	January 31, 2014	Examiner Name:	Nguyen, Nam V
		Conf. No.:	7068
Invention:	Programmable Communicator		
Date:	July 23, 2014		

**LIST OF PATENTS AND PUBLICATIONS FOR
APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

Examiner Signature: /Nam Nguyen/

Date Considered: 08/06/2014

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation *if not* in conformance and not considered. Include copy of this form with next communication to applicant.

Section 6. Copies of Listed Information Items Accompanying This Statement

Legible copies of all items listed in Forms PTO/SB/08A and 08B (substitute for Form PTO-1449) accompany this information statement.

Exception(s) to above:

U.S. patent citations are not included pursuant to the United States Patent and Trademark Office's September 21, 2004 waiver of the copy requirement in 37 CFR 1.98 for cited pending U.S. patent citations when the patent citations are available in the USPTO's IFW system.

Items in prior application, from which an earlier filing date is claimed for this application, as identified in Section 4.

Cumulative patents or publications identified in Section 5.

Section 8. Translation(s) of Non-English Language Documents

Submitted herewith is an English translation of the following foreign language patents, publications or information or of those portions of those patents, publications or information considered to be material:

Reference **II** is the counterpart that is in the English language of Reference **IW**;

Reference **IL** is an abstract that is in the English language of Reference **IK**;

Reference **IY** is an abstract that is in the English language of Reference **IX**;

Reference **JA** is believed to be a translation that is in the English language Reference **IZ**;

Reference **LK** is believed to be a translation that is in the English language Reference **LJ**; and

Reference **OC** is believed to be a translation that is in the English language Reference **OB**.

Section 10. Identification of Person Making This Supplemental Information Disclosure Statement

The person making this certification is the practitioner of record.

Dated: July 23, 2014

/Jonathan C. Lovely, #60,821/

SIGNATURE OF PRACTITIONER

Reg. No.: 60,821

Jonathan C. Lovely

(type or print name of practitioner)

Tel. No.: (617) 443-9292

Sunstein Kann Murphy & Timbers LLP

125 Summer Street, 11th Floor


Firm/Address

Customer No.: 002101

Boston, MA 02110-1618

Address

03781/01016 2140245.1

Index of Claims 	Application/Control No. 14169603	Applicant(s)/Patent Under Reexamination WESBY-VAN SWAAY, EVELINE
	Examiner NAM V NGUYEN	Art Unit 2682

✓	Rejected
=	Allowed


-	Cancelled
÷	Restricted

N	Non-Elected
I	Interference

A	Appeal
O	Objected

Claims renumbered in the same order as presented by applicant
 CPA
 T.D.
 R.1.47

CLAIM		DATE							
Final	Original	03/07/2014	08/06/2014						
1	1	✓	=						
2	2	✓	=						
3	3	✓	=						
4	4	✓	=						
5	5	✓	=						
6	6	✓	=						
7	7	✓	=						
8	8	✓	=						
9	9	✓	=						
10	10	✓	=						
11	11	✓	=						
12	12	✓	=						
13	13	✓	=						
14	14	✓	=						
15	15	✓	=						
16	16	✓	=						
17	17	✓	=						
18	18	✓	=						
19	19	✓	=						
20	20	✓	=						
21	21	✓	=						
22	22	✓	=						
23	23	✓	=						
24	24	✓	=						
25	25	✓	=						
26	26	✓	=						
	27	✓	-						
27	28	✓	=						
28	29	✓	=						
29	30	✓	=						

Application Number 	Application/Control No. 14/169,603	Applicant(s)/Patent under Reexamination WESBY-VAN SWAAY, EVELINE

Document Code - DISQ	Internal Document – DO NOT MAIL
-----------------------------	--

TERMINAL DISCLAIMER	<input checked="" type="checkbox"/> APPROVED	<input type="checkbox"/> DISAPPROVED
Date Filed : June 13, 2014	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:

Henry D Jefferson"
 5 td are approved

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Eveline Wesby-van Swaay

Application No.:	14/169,603	Art Unit/Group No.:	2682
Filing Date:	January 31, 2014	Examiner:	Nam V. Nguyen
		Conf. No.:	7068

For: PROGRAMMABLE COMMUNICATOR

**Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450**

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

List of Sections Forming Part of This Supplemental Information Disclosure Statement

The following sections are being submitted for this Supplemental Information Disclosure Statement:

1. Preliminary Statements
2. Forms PTO/SB/08A and 08B (substitute for Form PTO-1449)
3. Statement as to Information Not Found in Patents or Publications
4. Identification of Prior Application in Which Listed Information Was Already Cited and for Which No Copies Are Submitted or Need Be Submitted
5. Cumulative Patents or Publications
6. Copies of Listed Information Items Accompanying This Statement
7. Concise Explanation of Non-English Language Listed Information Items
 - 7A. International Search Report
 - 7B. English Language Version of International Search Report
8. Translation(s) of Non-English Language Documents
9. Concise Explanation of English Language Listed Information Items (Optional)
10. Identification of Person(s) Making This Supplemental Information Disclosure Statement

Section 1. Preliminary Statements

Applicants submit herewith patents, publications or other information, of which they are aware that they believe may be material to the examination of this application, and in respect of which, there may be a duty to disclose.

The filing of this supplemental information disclosure statement shall not be construed as a representation that a search has been made (37 C.F.R. § 1.97(g)), an admission that the information cited is, or is considered to be, material to patentability, or that no other material information exists.

The filing of this supplemental information disclosure statement shall not be construed as an admission against interest in any manner. *Notice of January 9, 1992, 1135 O.G. 13-25, at 25.*

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

U.S. PATENT DOCUMENTS					
Examiner Initials	Reference Number	Document Number	Issue Date	Inventor	Class/ Subclass
	HX	US 5,689,825 A	Nov. 18, 1997	Averbuch et al.	455/89
	HY	US 5,699,513 A	Dec. 16, 1997	Feigen et al.	395/187.01
	HZ	US 5,901,320 A	May 4, 1999	Takahashi et al.	395/712
	IA	US 5,922,074 A	Jul. 13, 1999	Richard et al.	713/200
	IB	US 5,983,350 A	Nov. 9, 1999	Minear et al.	713/201
	IC	US 6,108,531 A	Aug. 22, 2000	Berg et al.	455/408
	ID	US 6,327,466 B1	Dec. 4, 2001	Savolainen	455/407
	IE	US 6,377,577 B1	Apr. 23, 2002	Bechtolsheim et al.	370/392
	IF	US 6,388,612 B1	May 14, 2002	Neher	342/357.07
	IG	US 6,396,416 B1	May 28, 2002	Kuusela et al.	340/870.28
	IH	US 6,463,474 B1	Oct. 8, 2002	Fuh et al.	709/225
	II	US 6,671,522 B1	Dec. 30, 2003	Beaudou	455/558
	IJ	US 6,751,452 B1	Jun. 15, 2004	Kupczyk et al.	455/345

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Reference Number	Country Code	Document Number	Publication Date	Patentee or Applicant	Class/ Subclass
	IK	EP	0 459 344 A1	Dec. 4, 1991	Alcatel CIT	H04Q 7/04
	IL	EP	0 459 344 A1 [English Abstract]	Dec. 4, 1991	Alcatel CIT	H04Q 7/04
	IM	CA	1,296,068 C	Feb. 18, 1992	Friesen	A61B 5/00
	IN	EP	0 632 629 A1	Jan. 4, 1995	Multi-Tech Systems, Inc.	H04L 29/06
	IO	WO	96/42175 A1	Dec. 27, 1996	NE-Products OY	H04Q 7/22

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

FOREIGN PATENT DOCUMENTS						
Examiner Initials	Reference Number	Country Code	Document Number	Publication Date	Patentee or Applicant	Class/ Subclass
	IP	WO	97/16938 A1	May 9, 1997	Nokia Telecommunications OY	H04Q 7/32
	IQ	EP	0 804 046 A2	Oct. 29, 1997	Nokia Mobile Phones Ltd.	H04Q 7/32
	IR	GB	2 313 519 A	Nov. 26, 1997	Motorola GmbH	H04Q 7/32
	IS	WO	98/38820 A2	Sep. 3, 1998	Telefonaktiebolaget LM Ericsson	H04Q 7/22
	IT	WO	99/20070 A2	Apr. 22, 1999	NE-Products OY	H04Q 7/38
	IU	WO	99/57875 A2	Nov. 11, 1999	NE-Products OY	H04M 3/42
	IV	WO	00/17021 A1	Mar. 30, 2000	Van Bergen	B60R 25/04
	IW	EP	0 996 299 A1	Apr. 26, 2000	Société Francaise du Radiotéléphone SRF	H04Q 7/22
	IX	WO	01/35686 A1	May 17, 2001	Wavecom	H04Q 7/32
	IY	WO	01/35686 A1 [English Abstract]	May 17, 2001	Wavecom	H04Q 7/32

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Wesby-van Swaay	Attorney Docket:	3781/1016
Serial No:	14/169,603	Art Group Unit:	2682
Date Filed:	January 31, 2014	Examiner Name:	Nguyen, Nam V
		Conf. No.:	7068
Invention:	Programmable Communicator		
Date:	July 23, 2014		

**LIST OF PATENTS AND PUBLICATIONS FOR
APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	IZ		Lyhenteiden Ja Merkkien Selitykset, 57 pages
	JA		Legends of Abbreviations and Symbols, 57 pages (January, 2014) [English Translation]
	JB		Modbus/BSAP Configuration, 2 pages
	JC		Photo of METHOD Locollzation objects, 8604, 1 page
	JD	3GPP (3 rd Generation Partnership Project)	<i>3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; International Mobile station Equipment Identities (IMEI) (Release 9), Version 9.0.0, 8 pages (September, 2009)</i> 3GPP – TS 22.016
	JE	3GPP (3 rd Generation Partnership Project)	<i>The Mobile Broadband Standard, 3GPP Specification detail, Specification of the Subscriber Identity Module – Mobile Equipment (SIM-ME) Interface, 4 pages, 3GPP TS 11.11</i>
	JF	3GPP (3 rd Generation Partnership Project)	<i>The Mobile Broadband Standard, 3GPP Specification detail, General Packet Radio Service (GPRS); Service description; Stage 2, 3 pages (April, 2014) 3GPP TS 03.60</i>
	JG	AirLink Communications, Inc.	“AirLink Communications Releases New Wireless ACE,” 1 page (April, 1998)
	JH	AirLink Communications, Inc.	AirLink News / CDPD in the News, 1 page (December, 1998) http://www.archive.org/web/19981212022616/http://www.airlink.com)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	JI	AirLink Communications, Inc.	CDPD Raven, Raven Brochure, 2 pages (January, 1999) (http://www.archive.org/web/19990117024728/http://www.airlink.com/info/rav_mkt.html)
	JJ	AirLink Communications, Inc.	Airlink Raven/PinPoint CDPD Modem, User's Manual, 68 pages (February, 1999)
	JK	AirLink Communications, Inc.	PinPoint Vehicle Installation Guide, 6 pages (February, 2000)
	JL	AirLink Communications, Inc.	Raven Installation Guide, 8 pages (May, 2000)
	JM	AirLink Communications, Inc.	Wireless ACE Release Notes: "7/12/00 – ACE version 1.50," 3 pages (August, 2000)
	JN	AirLink Communications, Inc.	Proven Wireless Solutions, Intelligent Transportation System (ITS) Applications, 1 page (February, 2001)
	JO	AirLink Communications, Inc.	Proven Wireless Solutions, Telemetry Applications, 1 page (February, 2001)
	JP	AirLink Communications, Inc.	Press Release: "AirLink Announces New Raven II CDPD Modem," 1 page (April, 2001)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Wesby-van Swaay	Attorney Docket:	3781/1016
Serial No:	14/169,603	Art Group Unit:	2682
Date Filed:	January 31, 2014	Examiner Name:	Nguyen, Nam V
		Conf. No.:	7068
Invention:	Programmable Communicator		
Date:	July 23, 2014		

**LIST OF PATENTS AND PUBLICATIONS FOR
APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	JQ	AirLink Communications, Inc.	Press Release: "AirLink Communications & Novatel Wireless Enforce Better Communications for the Tampa Police Department," 2 pages (May, 2001)
	JR	AirLink Communications, Inc.	ACE Release Notes: "7/26/02 - ACE version 1.80.15," 5 pages (October, 2002)
	JS	AirLink Communications, Inc.	AirLink CDPD Modem AT Commands, Quick Reference, 24 pages (October, 2002)
	JT	AirLink Communications, Inc.	Raven Firmware Release Notes: "January 25, 2002 Raven II Release 200201D," 2 pages (October, 2002)
	JU	AirLink Communications, Inc.	Wireless ACE, User's Manual, 48 pages (December, 2002)
	JV	Auerbach	Handbook of Local Area Networks 1999, 67 pages (1996)
	JW	BioPhone	BIOPHONE 3502u, Instruction & Troubleshooting Manual, 149 Pages (May, 1978)
	JX	BioPhone	Photos of BIOPHONE, Model 3502, 5 pages
	JY	Blasch et al.	"Georgia Tech Aerial Robotics System Competition Entry," <i>Georgia Institute of Technology School of Aerospace</i> , 10 pages (March, 1994)
	JZ	CDPD Forum, Inc.	"Circuit Switched - Cellular Digital Packet Data," Part 1024, Release 1.5, 90 pages (June, 1995)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	KA	CDPD Forum, Inc.	"CS CDPD Modem Bank Management Protocol (MBMP)," Part 1025, Release 1.5, 48 pages (June, 1995)
	KB	CDPD Forum, Inc.	"CS CDPD Accounting Service and Protocol," Part 1026, Release 1.5, 20 pages (June, 1995)
	KC	Eagle Cross	"For Cellular Data Transmission, It's Either THE OUTBACK or This," 4 pages
	KD	Davies	"A Brief History of Cryptography," <i>Information Security Technical Report</i> , Vol. 2, No. 2, pp. 14-17 (1997)
	KE	DeRose	"The Wireless Data Handbook," 4 th Edition, 399 pages (1999)
	KF	Doelz et al.	"Binary Data Transmission Techniques for Linear Systems*," <i>Proceedings of the IRE</i> , pp. 656-661 (May, 1957)
	KG	Electronic Compliance Laboratories, Inc.	EMI Test Report on Symphony ISA Card; Prepared for Proxim, Test Report No. A806003, 42 pages (June, 1998)
	KH	European Telecommunications Standards Institute (ETSI)	<i>Release Note: Recommendation GSM 02.16, International MS Equipment Identities, European digital cellular telecommunication system (phase 1); GSM Technical Specification, Version 3.0.1, 9 pages (February, 1992)</i>

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	KI	European Telecommunications Standards Institute (ETSI)	<i>GSM Technical Specification: Digital cellular telecommunications system (Phase 2+); Physical Layer on the radio path; General description (GSM 05.01, version 5.0.0), 20 pages (May, 1996) Reference: TS/SMG-020501Q</i>
	KJ	European Telecommunications Standards Institute (ETSI)	<i>Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Service description Stage 2 (GSM 03.60, version 6.3.2, Release 1997), 107 pages (July, 1997) EN 301 344</i>
	KK	European Telecommunications Standards Institute (ETSI)	<i>GSM Technical Specification – Digital cellular telecommunications system (Phase 2+); Use of Data Terminal Equipment - Data Circuit terminating; Equipment (DTE - DCE) interface for Short Message Service (SMS) and Cell Broadcast Service (CBS) (GSM 07.05, version 5.5.0, Release 1998), 69 pages (January, 1998) Reference: GTS/SMG-040705QR</i>
	KL	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+); Specification of the SIM Application Toolkit for the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface (GSM 11.14, version 7.3.0, Release 1998) 101 pages, (July, 1999) TS 101 267</i>

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	KM	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+); Mobile Stations (MS) features (GSM 02.07, version 6.1.0, Release 97), 22 pages (July, 1998) TS 100 906</i>
	KN	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+); Security Mechanisms for the SIM application toolkit; Stage 2 (GSM 03.48, version 6.1.0, Release 97), 20 pages (July, 1998) TS 101 181</i>
	KO	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+); Specification of the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface (GSM 11.11, version 6.1.0, Release 1997), 125 pages (July, 1998) TS 100 977</i>
	KP	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+); Specification of the SIM Application Toolkit for the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface (GSM 11.14, version 7.1.0, Release 1998), 98 pages (November, 1998)</i>

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	KQ	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+); Security Mechanisms for the SIM application toolkit; Stage 2 (GSM 03.48, version 7.0.1, Release 1998), 21 pages (July, 1999) ETSI TS 101 181</i>
	KR	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Mobile Station (MS) supporting GPRS (GSM 07.60, version 7.0.0, Release 1998), 47 pages (July, 1999) ETSI TS 101 356</i>
	KS	European Telecommunications Standards Institute (ETSI)	<i>Technical specification: Digital cellular telecommunications system (Phase 2+); AT command set for GSM Mobile Equipment (ME) (GSM 07.07, version 7.3.0, Release 1998), 125 pages (July, 1999) ETSI TS 100 916</i>
	KT	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+); GSM Release 1999 Specifications (GSM 01.01, version 0.4.0, Release 1999), 22 pages (October, 1999)</i>
	KU	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+); GSM Release 1999 Specifications (GSM 01.01, version 1.0.0, Release 1999), 23 pages (November, 1999)</i>

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	KV	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+); Subscriber Identity Module Application Programming Interface (SIM API); SIM API for Java Card™; Stage 2 (GSM 03.19, version 7.0.0, Release 1998), 22 pages (November, 1999) ETSI TS 101 476</i>
	KW	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+); AT command set for GSM Mobile Equipment (ME) (GSM 07.07, version 6.4.0, Release 1997), 116 pages (November, 1999) ETSI TS 100 916</i>
	KX	European Telecommunications Standards Institute (ETSI)	<i>Technical specification: Digital cellular telecommunications system (Phase 2+); AT command set for GSM Mobile Equipment (ME) (GSM 07.07, version 7.5.0, Release 1998), 127 pages (December, 1999) ETSI TS 100 916</i>
	KY	European Telecommunications Standards Institute (ETSI)	<i>Digital cellular telecommunications system (Phase 2+); AT command set for GSM Mobile Equipment (ME) (GSM 07.07, version 5.9.1, Release 1996), 98 pages (December, 1999) ETS 300 916</i>

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	KZ	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Use of Data Terminal Equipment – Data Circuit terminating; Equipment (DTE-DCE) interface for Cell Broadcast Service (CBS) (3G TS 27.005, version 3.1.0, Release 1999), 70 pages (January, 2000) ETSI TS 127 005</i>
	LA	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); AT command set for 3GPP User Equipment (UE) (3G TS 27.007, version 3.3.0, Release 1999), 147 pages (January, 2000) ETSI TS 127 007</i>
	LB	European Telecommunications Standards Institute (ETSI)	<i>Technical Specification: Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); AT command set for 3GPP User Equipment (UE) (3G TS 27.007, version 3.4.0, Release 1999), 156 pages (March, 2000) ETSI TS 127 007</i>
	LC	European Telecommunications Standards Institute (ETSI)	<i>GSM Technical Specification: Digital cellular telecommunications system (Phase 2+); International Mobile station Equipment Identities (IMEI) (GSM 02.16, version 5.2.0, Release 1996), 12 pages (August, 2000) Reference: RGTS/SMG-010216QR2</i>

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Wesby-van Swaay	Attorney Docket:	3781/1016
Serial No:	14/169,603	Art Group Unit:	2682
Date Filed:	January 31, 2014	Examiner Name:	Nguyen, Nam V
		Conf. No.:	7068
Invention:	Programmable Communicator		
Date:	July 23, 2014		

**LIST OF PATENTS AND PUBLICATIONS FOR
APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	LD	Falcom GmbH	TANGO Hardware Description, Version 1.04, 50 pages
	LE	Falcom GmbH	FALCOM A2D Evaluation Kit, Short Form, Version 1.00, 2 pages
	LF	Falcom GmbH	FALCOM A2D-3, A2D-3JP3, A3D & A3D-JP3, User's Manual, Version 1.08, 69 pages
	LG	Falcom GmbH	FALCOM A2D (Including A2D-A/B/C and A2D-1), Version 1.12, 94 pages
	LH	Falcom GmbH	FALCOM A2D-3, A2D-3JP3, A3D & A3DJP3 (Programming Manual), Version 1.17, 56 pages
	LI	Falcom	Alternative A2D3-GPS firmware, with more features and stability, Firmware revision 208, User Manual Revision DR0.11z, 25 pages (2001)
	LJ	Falcom	GSM Modul, GSM Modem und GSM Telefon für Daten, Fax, SMS und Sprache mit RS232, Falcom A2 GSM 900, 6 pages (January, 2014)
	LK	Falcom	GSM modul, GSM Modem and GSM phone for data, Fax, SMS and voice with RS232, Falcom A2 GSM 900, 6 pages (January, 2014) [English Translation]

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	LL	Falcon	Falcon® 330 & 335; Portable Data Terminals, "Setting a New Standard for Industrial Portable Data Collection Terminals," 2 pages
	LM	Federal Communications Commission	Wavecom Inc. - Grant of Equipment Authorization, 1 page, dated February 16, 2000
	LN	Finkel et al.	VIC 20 Programmer's Reference Guide, <i>Commodore Business Machines, Inc.</i> , First Edition, 307 pages (1982)
	LO	Fluke	Wireless Logger, User's Manual, PN 936562, Rev. 2, 212 pages (June, 1993)
	LP	Foxboro®	I/A Series® Hardware Mobile Workstation Indoor Unit, PSS 21-4W2 B4, 8 pages
	LQ	Funkanlagen Leipoldt OHG	Falcom A23- Programming Manual, Version 1.02, 32 pages (September, 1999)
	LR	Funkanlagen Leipoldt OHG	Falcom A2 (Including A2-A, A2-B, A2-1 and Evaluation Board), User Manual / Command List, 99 pages (October, 1999)
	LS	George	"HC05 MCU Software-Driven Asynchronous Serial Communication Techniques Using the MC68HC705J1A," <i>Freescale Semiconductor</i> , AN1240 (22 pages)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	LT	GPS Navstar	Global Positioning System, Standard Positioning Service Signal Specification, Second Edition, 51 pages (June, 1995)
	LU	GRAFIK Eye®	GRX-RS232 Interface Control, GRX-PRG Programming Interface, Class 2/PELV Devices, Installation and Operation Instructions, 4 pages (1999)
	LV	Harris Corp.	Photos of the RF-5000, 3 pages
	LW	Harris Corp. RF Communications Group	RF-5020 RT Maintenance Manual, 270 pages (October, 1991)
	LX	Hearst Electronics Products	"Wireless LAN adapter brings 1.6-Gbit/s connectivity to handheld PCs" Proxim, 1 page (May, 1997)
	LY	HomeRF	HomeRF: Bringing Wireless Connectivity Home, 27 pages (March, 1999)
	LZ	HomeRF	Interference Immunity of 2.4 Ghz Wireless LANs, 10 pages (2001)
	MA	HomeRF	A Comparison of Security in HomeRF versus IEEE802.11b, 7 pages (2001)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	MB	Hong Kong Awards	2013 Hong Kong Awards for Industry awarded Sierra the "Technological Achievement Certificate of Merit" for the AirPrime® WS6318 Embedded Wireless Module as the "world's smallest cellular module", 4 pages (http://www.sierrawireless.com/Newsroom/Awards/product_awards.aspx)
	MC	Hunkins	"Emergence of Consumer Solutions in Vehicle Telematics," <i>Telcontar</i> , 13 pages (December, 2003)
	MD	Intel	8251A Programmable Communication Interface, Order No. 205222-002, 25 pages (November, 1996)
	ME	Intermec Technologies Corporation	"5055 Data Collection PC, Technical Reference," Revision C, P/N 978-054-002, 194 pages (May, 2001)
	MF	International Telecommunication Union	<i>ITU-T: Telecommunication Standardization Sector of ITU, Data Communication over the Telephone Network, Serial Asynchronous Automatic Dialling and Control (V.25 ter)</i> , 74 pages (August, 1995)
	MG	Kinetic	PC/Piranha™, Driving the Network Economy, <i>Wireless Solutions for Mobile Operations</i> , 2 pages
	MH	Korba	"Security System for Wireless Local Area Networks," <i>National Research Council of Canada</i> , pp. 1550-1554 (1998)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Wesby-van Swaay	Attorney Docket:	3781/1016
Serial No:	14/169,603	Art Group Unit:	2682
Date Filed:	January 31, 2014	Examiner Name:	Nguyen, Nam V
		Conf. No.:	7068
Invention:	Programmable Communicator		
Date:	July 23, 2014		

**LIST OF PATENTS AND PUBLICATIONS FOR
APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	MI	Kramer	"Cellular Combos Differ in Heft, Abilities - <i>Eagle Cross Device Is Fast but Heavy; PowerTek and Vital Offer Cheaper, Lighter Products</i> ," <i>PC Week</i> , Vol. 8, No. 42, pp. 160-164 (October, 1991)
	MJ	Kyocera – North America	"Kyocera Wireless Corp. Announces New CDMA Module Product Line," 2 pages (March, 2001)
	MK	Lexis Nexis	"Sierra Wireless Expands Data Product Line with New 3-Watt Telemetry Modem," 2 pages (October, 1997)
	ML	Luhowy	"Advances In HF Parallel Tone Modem Technology," Harris Corporation, RF Communications Group, 5 pages (1988)
	MM	Lutron®	"RF-Modem Installation for HomeWorks™," Application Note #37, 6 pages (1997)
	MN	Lynch et al.	"Piezoelectric Structural Excitation using a Wireless Active Sensing Unit," 9 pages
	MO	Lynch et al.	"The Design of a Wireless Sensing Unit for Structural Health Monitoring," <i>Proc. of the 3rd Int. Workshop on Structural Health Monitoring, Stanford, CA</i> , 10 pages (September, 2001)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	MP	Medical Device & Diagnostic Industry Magazine	"Wireless Technologies Fine Niche in Patient Care," <i>Medical Device & Diagnostic Industry Magazine</i> , 11 pages (August, 1998)
	MQ	Mobile Merit Award	Mobile Merit Award for the "Mobile Health" category was awarded to Vgo for using the Novatel E362 (http://investor.novatelwireless.com/releasedetail.cfm?ReleaseID=668463) (2012)
	MR	Mobile Merit Award	Mobile Merit Award for the "Connected Life Category" was awarded to Novatel Wireless for its "SA 2100 M2M Device," 2 pages (2013) (http://investor.novatelwireless.com/releasedetail.cfm?ReleaseID=790042)
	MS	Myles et al.	"A Mobile Host Protocol Supporting Route Optimization and Authentication," <i>IEEE J. Sel. Area Comm.</i> , Vol. 13, No. 5, pp. 839-849 (June, 1995)
	MT	National Semiconductor	PC165550D Universal Asynchronous Receiver/Transmitter with FIFOs, 22 pages (June, 1995)
	MU	National Semiconductor	PC16450C/NS16450, PC8250A/INS8250A Universal Asynchronous Receiver/Transmitter, 18 pages (July, 1990)
	MV	Negus et al.	"HomeRF™: Wireless Networking for the Connected Home," 10 pages

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	MW	Negus et al.	“History of Wireless Local Area Networks (WLANs) In the Unlicensed Bands,” <i>George Mason University Law School Conference, Information Economy Project, Arlington, VA</i> , pp. 1-13 (April, 2008)
	MX	Nokia	NOKIA PremiCell, Operator’s Guide, 58 pages (December, 1997)
	MY	Nokia	Nokia Card Phone 1.0, 3 pages (June, 1997)
	MZ	Nokia	User’s Guide, 22 pages (1998)
	NA	Nokia	Nokia Card Phone 2.0, 1 page (June, 1999)
	NB	Nokia	Nokia Card Phone; Quick guide for a Windows terminal window with the Nokia Card Phone 2.0, 6 pages (April, 2000)
	NC	Nokia	Nokia Card Phone; Support Guide for Using the Nokia Cardphone 2.0 in a Windows CE Device, Version 1.0, 9 pages (March, 2001)
	ND	Nokia	Nokia Premicell 18i, 2 pages (April, 2014)
	NE	Nomadic Corp.	“Mercury User’s Guide,” Version 2.3, 96 pages (1996)
	NF	Professional PC Companion	NEC MobilePro™ 780, 2 pages (April, 2000)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	NG	Proxim	Harmony™, Harmony OpenAir™ PC Card Datasheet, Rev. B, 2 pages (July, 2001)
	NH	Proxim	Harmony™, Harmony Access Point Controller Datasheet, Rev. B, 2 pages (June, 2002)
	NI	Proxim	Proxim Antennas and Accessories, Product Guide, Rev. B, 4 pages (January, 2000)
	NJ	Proxim	Symphony™; Create a Wireless Network for Your Home, Rev. A, 4 pages (September, 2001)
	NK	Proxim	Symphony-HRF Cordless Gateway; <i>Simple Reliable Home and Small Office Computer Networking Without Wires</i> , 2 pages (June, 2000)
	NL	Proxim	“Pediatric Software and ReangeLAN2™ Keep Pediatricians On The Move, <i>A Wireless LAN Case Study</i> ,” 2 pages (September, 1999)
	NM	Proxim	RangeLAN2: Extension Point Technical Guide; Configuring and using Extension Points in wireless LAN installations, <i>White Paper</i> , 16 pages (January, 1998)
	NN	Proxim	RangeLAN2™ Ethernet and Token Ring Access Points; <i>Wireless Mobile Access to Wired LAN Services</i> , Data Sheet, 2 pages (March, 1998)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	NO	Proxim, Inc.	RangeLAN2 7420 Series PC Card Wireless LAN Adaptor Product Information, 101 pages (2000)
	NP	Proxim	RangeLAN2/ISA, <i>Wireless LAN Adapter for ISA Bus Computers</i> , User's Guide, 65 pages (1993)
	NQ	Proxim	RangeLAN2 Model 7500, User's Guide, 72 pages (1993)
	NR	Proxim	"What is a Wireless LAN?", <i>White Paper</i> , 5 pages (March, 1998)
	NS	Proxim	RangeLAN2 Access Point Models 7510 and 752x, User's Guide, 103 pages (1999)
	NT	Proxim	RangeLAN2 Extension Point Models 7540 and 7541, User's Guide, 84 pages (1999)
	NU	Proxim	RangeLAN2 TM 7910 Series Serial Adapter, <i>Enabling the Portability of RS-232 Devices</i> , Data Sheet, 2 pages (June 1999)
	NV	Proxim	RangeLAN2 TM 7410 CE PC Card, <i>Mobilizing the Workforce with Handheld PCs</i> , Data Sheet, 2 pages (November, 1999)
	NW	Proxim	RangeLAN2 TM 7110 PCI Card, Data Sheet, 2 pages (December, 1999)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Wesby-van Swaay	Attorney Docket:	3781/1016
Serial No:	14/169,603	Art Group Unit:	2682
Date Filed:	January 31, 2014	Examiner Name:	Nguyen, Nam V
		Conf. No.:	7068
Invention:	Programmable Communicator		
Date:	July 23, 2014		

**LIST OF PATENTS AND PUBLICATIONS FOR
APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	NX	Proxim	RangeLAN2™ 7420 Series PC Card, <i>Networking Laptops and Handhelds Without Wires</i> , Data Sheet, 2 pages (April, 2000)
	NY	Proxim	Case Study, Wlan Healthcare, Kadlec Medical Center, 1 page (2002)
	NZ	Proxim	Harmony Access Point Controller, User's Guide, 123 pages (2002)
	OA	Reiter et al.	"Data on The Go: Three Cellular Modems," <i>PC Magazine</i> , pp. 365-382 (December, 1990)
	OB	Savolainen	Solukkoverkon maksupuhelin, 64 pages (February, 2014)
	OC	Savolainen	Cellular Payphone, 64 pages (February, 2014) [English Translation]
	OD	Security Escort Training	"A Guide to assist you in estimating, installing, operating and maintaining Security Escort Systems," 142 pages
	OE	Sierra Wireless	"Sierra Wireless Combines Cellular Data, GPS; MP 200-GPS Modem Provides Both in a Single Package," <i>The Free Library</i> , 3 pages (January, 1997)
	OF	Sierra Wireless	MP215 Modem; Installation Configuration and User's Guide," Rev. 1.0, Part No. 2110036, 38 pages (June, 1998)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	OG	Sierra Wireless	SB300 OEM Modem, Product Specification, Rev. C, Part No. 2110049, Preliminary, 22 pages (July, 1998)
	OH	Sierra Wireless	MP200 Product Manual, Welcome to the MP200 Radio Modem, 2110026, Rev. 2.0, 84 pages (March, 2000)
	OI	Sierra Wireless	AirPrime SL9090 as the "Best Industrial M2M Wireless Module" 2012 Annual Best of Electric Design Awards, 1 page (2012) (http://www.sierrawireless.com/Newsroom/Awards.aspx)
	OJ	Sierra Wireless	Photos of Pocketplus210, 3 pages
	OK	Sierra Wireless	Enlarged Photo of DART 200 CDPD Modem, FCC ID: LL9CMIM01, 1 page
	OL	Sierra Wireless	Photo of DART 200 CDPD Modem, 1 page
	OM	Sierra Wireless	Photo of DART 200 CDPD Modem, FCC ID: LL9CMIM01, 1 page
	ON	Sierra Wireless	Photo of PocketPlus 211
	OO	Sierra Wireless	PocketPlus from Sierra Wireless, Previewing the Full-Featured Wireless Modem for the Mobile Computer User, 2 pages (1993)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Wesby-van Swaay	Attorney Docket:	3781/1016
Serial No:	14/169,603	Art Group Unit:	2682
Date Filed:	January 31, 2014	Examiner Name:	Nguyen, Nam V
		Conf. No.:	7068
Invention:	Programmable Communicator		
Date:	July 23, 2014		

**LIST OF PATENTS AND PUBLICATIONS FOR
APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	OP	Siemens	S25 User Guide, 64 pages (August, 1999)
	OQ	Siemens	Photos of Siemens M20 Terminal / Nokia PremiCell / Sensaphone 2000 / Novatel Wireless Technologies Ltd. Modem / Sierra Wireless SB300, 13 pages
	OR	SOMA Technology, Inc.	Philips® PageWriter Touch ECG, 5 pages (April, 2008)
	OS	Trimble, The GPS Solution	SVeeSix-CM3™, GPS Model for Embedded OEM, 2 pages (March, 1995)
	OT	Trimble Navigation	SV eeSix-CM3™, Embedded GPS Core Module, System Designer, Reference Manual, 246 pages (July, 1997)
	OU	Trimble Navigation Limited	<i>Lassen™ LP GPS – System Designer Reference Manual</i> , Part Number: 39264-00, Firmware: 7.82, 210 pages (August, 1999)
	OV	WaveCom	WM02 G900 / G1800 / G1900, GSM Modem, Version 1.0, 96 pages (May, 1999)
	OW	WaveLan	Company Overview, WaveLAN Competitive Bulletin, WaveLAN versus Proxim Range LAN, 6 pages
	OX	Verizon Wireless News Center	“Philadelphia Police Department Goes On-Line With Mobile Data Terminals in Vehicles, National Law Enforcement Week Marks Debut of New Weapon Ensuring Officer Safety, Efficiency,” 5 pages (May, 1997)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	OY	Connolly Bove Lodge & Hutz LLP and K&L Gates, LLP, <i>Counsel for Enfora, Inc.</i>	<i>Defendants Enfora, Inc. and Sierra Wireless America, Inc.'s Fourth Supplemental Invalidity Contentions</i> , M2M Solutions LLC v. Sierra Wireless America, Inc. and Sierra Wireless, Inc. et al. – U.S. District Court for the District of Delaware, Civil Action No. 12-030-RGA and 12-032-RGA, dated May 5, 2014 (22 pages)
	OZ	Connolly Bove Lodge & Hutz LLP and K&L Gates, LLP, <i>Counsel for Enfora, Inc.</i>	<i>Appendix MM - Defendants Enfora, Inc. and Sierra Wireless America, Inc.'s Fourth Supplemental Invalidity Contentions</i> , M2M Solutions LLC v. Sierra Wireless America, Inc. and Sierra Wireless, Inc. et al. – U.S. District Court for the District of Delaware, Civil Action No. 12-030-RGA and 12-032-RGA, dated May 5, 2014 (140 pages)
	PA	Connolly Bove Lodge & Hutz LLP and K&L Gates, LLP, <i>Counsel for Enfora, Inc.</i>	<i>Appendix NN - Defendants Enfora, Inc. and Sierra Wireless America, Inc.'s Fourth Supplemental Invalidity Contentions</i> , M2M Solutions LLC v. Sierra Wireless America, Inc. and Sierra Wireless, Inc. et al. – U.S. District Court for the District of Delaware, Civil Action No. 12-030-RGA and 12-032-RGA, dated May 5, 2014 (143 pages)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Wesby-van Swaay Attorney Docket: 3781/1016
 Serial No: 14/169,603 Art Group Unit: 2682
 Date Filed: January 31, 2014 Examiner Name: Nguyen, Nam V
 Conf. No.: 7068
 Invention: Programmable Communicator
 Date: July 23, 2014

**LIST OF PATENTS AND PUBLICATIONS FOR
 APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

OTHER DOCUMENTS			
Examiner Initials	Reference Number	Author	Title of Article, Title of Journal, Volume Number, Page Numbers, Date
	PB	Connolly Bove Lodge & Hutz LLP and K&L Gates, LLP, <i>Counsel for Enfora, Inc.</i>	<i>Appendix OO - Defendants Enfora, Inc. and Sierra Wireless America, Inc.'s Fourth Supplemental Invalidity Contentions</i> , M2M Solutions LLC v. Sierra Wireless America, Inc. and Sierra Wireless, Inc. et al. – U.S. District Court for the District of Delaware, Civil Action No. 12-030-RGA and 12-032-RGA, dated May 5, 2014 (148 pages)
	PC	Connolly Bove Lodge & Hutz LLP and K&L Gates, LLP, <i>Counsel for Enfora, Inc.</i>	<i>Appendix PP - Defendants Enfora, Inc. and Sierra Wireless America, Inc.'s Fourth Supplemental Invalidity Contentions</i> , M2M Solutions LLC v. Sierra Wireless America, Inc. and Sierra Wireless, Inc. et al. – U.S. District Court for the District of Delaware, Civil Action No. 12-030-RGA and 12-032-RGA, dated May 5, 2014 (156 pages)
	PD	Connolly Bove Lodge & Hutz LLP and K&L Gates, LLP, <i>Counsel for Enfora, Inc.</i>	<i>Appendix QQ - Defendants Enfora, Inc. and Sierra Wireless America, Inc.'s Fourth Supplemental Invalidity Contentions</i> , M2M Solutions LLC v. Sierra Wireless America, Inc. and Sierra Wireless, Inc. et al. – U.S. District Court for the District of Delaware, Civil Action No. 12-030-RGA and 12-032-RGA, dated May 5, 2014 (82 pages)

Section 2. Forms PTO/SB/08A and 08B (formerly Form PTO-1449)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Wesby-van Swaay	Attorney Docket:	3781/1016
Serial No:	14/169,603	Art Group Unit:	2682
Date Filed:	January 31, 2014	Examiner Name:	Nguyen, Nam V
		Conf. No.:	7068
Invention:	Programmable Communicator		
Date:	July 23, 2014		

**LIST OF PATENTS AND PUBLICATIONS FOR
APPLICANT'S SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

Examiner Signature: _____

Date Considered: _____

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation *if not* in conformance and not considered. Include copy of this form with next communication to applicant.

Section 6. Copies of Listed Information Items Accompanying This Statement

Legible copies of all items listed in Forms PTO/SB/08A and 08B (substitute for Form PTO-1449) accompany this information statement.

Exception(s) to above:

U.S. patent citations are not included pursuant to the United States Patent and Trademark Office's September 21, 2004 waiver of the copy requirement in 37 CFR 1.98 for cited pending U.S. patent citations when the patent citations are available in the USPTO's IFW system.

Items in prior application, from which an earlier filing date is claimed for this application, as identified in Section 4.

Cumulative patents or publications identified in Section 5.

Section 8. Translation(s) of Non-English Language Documents

Submitted herewith is an English translation of the following foreign language patents, publications or information or of those portions of those patents, publications or information considered to be material:

Reference **II** is the counterpart that is in the English language of Reference **IW**;

Reference **IL** is an abstract that is in the English language of Reference **IK**;

Reference **IY** is an abstract that is in the English language of Reference **IX**;

Reference **JA** is believed to be a translation that is in the English language Reference **IZ**;

Reference **LK** is believed to be a translation that is in the English language Reference **LJ**; and

Reference **OC** is believed to be a translation that is in the English language Reference **OB**.

Section 10. Identification of Person Making This Supplemental Information Disclosure Statement

The person making this certification is the practitioner of record.

Dated: July 23, 2014

/Jonathan C. Lovely, #60,821/

SIGNATURE OF PRACTITIONER

Reg. No.: 60,821

Jonathan C. Lovely

(type or print name of practitioner)

Tel. No.: (617) 443-9292

Sunstein Kann Murphy & Timbers LLP

125 Summer Street, 11th Floor

Firm/Address

Customer No.: 002101

Boston, MA 02110-1618

Address

03781/01016 2140245.1



Europäisches Patentamt
European Patent Office
Office européen des brevets



① Numéro de publication: **0 459 344 A1**

⑫ **DEMANDE DE BREVET EUROPEEN**

⑳ Numéro de dépôt: **91108566.0**

⑤① Int. Cl.⁵: **H04Q 7/04**

㉑ Date de dépôt: **27.05.91**

㉒ Priorité: **30.05.90 FR 9006710**

⑦① Demandeur: **ALCATEL CIT**
12 Rue de la Baume
F-75008 Paris(FR)

④③ Date de publication de la demande:
04.12.91 Bulletin 91/49

⑦② Inventeur: **Ballard, Michel**
64, avenue Marguerite Renaudin
F-92140 Clamart(FR)
Inventeur: **Issenmann, Edouard**
13, rue Welvert
F-78150 Le Chesnay(FR)

④④ Etats contractants désignés:
AT BE CH DE DK ES FR GB IT LI NL SE

⑦④ Mandataire: **Weinmiller, Jürgen et al**
Lennéstrasse 9 Postfach 24
W-8133 Feldafing(DE)

⑤④ **Dispositif de téléchargement de logiciel pour un terminal de télécommunication.**

⑤⑦ L'invention concerne un dispositif pour télécharger un terminal de télécommunication, par exemple un radiotéléphone (9), afin de changer son logiciel de fonctionnement, sans que l'utilisateur de ce radiotéléphone doive l'apporter à une agence commerciale de l'opérateur du réseau de radiotéléphonie. Dans un exemple de réalisation, chaque radiotéléphone comporte :

- une pluralité de mémoires vives (1, 2) pour stocker différents logiciels de fonctionnement;
- une mémoire morte (3) stockant un logiciel de téléchargement;
- un microprocesseur (4) exécutant soit le logiciel de téléchargement, soit l'un des programmes de fonctionnement;
- une interface radio classique (5), utilisée, d'une part, comme interface de téléchargement, et d'autre part, pour les liaisons radiotéléphoniques classiques.

Application à tous les terminaux de télécommunication, comportant un microprocesseur, notamment les terminaux répandus en très grand nombre dans le public.

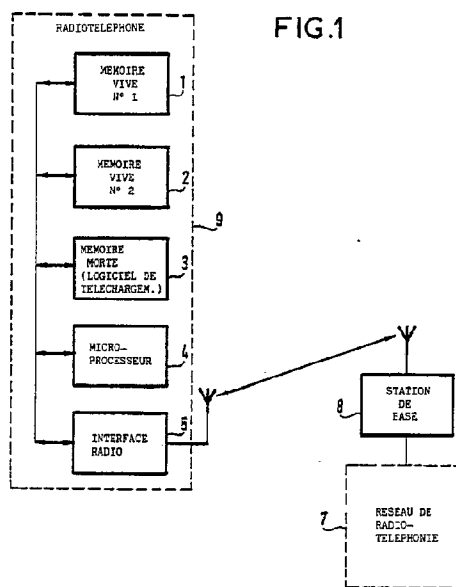


FIG.1

EP 0 459 344 A1

L'invention concerne un dispositif de téléchargement de logiciel pour un terminal de télécommunication, tel qu'un radiotéléphone mobile pour réseau cellulaire, ou un téléphone sans fil, ou un terminal fixe de réseau numérique à intégration de services. Ces terminaux ont des caractéristiques communes :

- ils exécutent un logiciel, car ils comportent un microprocesseur réalisant l'essentiel des opérations constituant leur fonctionnement;
- ils sont diffusés en très grand nombre dans le grand public.

Le logiciel exécuté par chacun des terminaux doit pouvoir évoluer au cours du temps, pour : corriger des anomalies de ce logiciel; ou améliorer le fonctionnement du terminal; ou offrir de nouveaux services aux abonnés; ou suivre l'évolution des spécifications techniques des réseaux de télécommunication; ou s'adapter à différents réseaux nécessitant l'exécution de logiciels différents, par exemple si un terminal est déplacé d'un pays à un autre.

Changer le logiciel exécuté par un terminal présente des difficultés importantes. Le logiciel est classiquement stocké dans une mémoire morte. Changer un logiciel nécessite de rapporter les terminaux à une agence commerciale et de remplacer des composants dans ces terminaux. Chaque terminal est donc indisponible à l'utilisateur pendant un certain temps. Ces opérations sont donc coûteuses pour l'opérateur du réseau.

L'article "Portable Telecommunication" dans "Proceedings of the national communications forum" vol 42 n° 2, 30 septembre 1988, page 1708, mentionne que des protocoles de réseau, des services et des possibilités d'accès peuvent être téléchargés dans un terminal portable de télécommunication. Cependant cette solution n'est pas bien adaptée au cas d'un terminal mobile qui franchit fréquemment une frontière entre deux territoires sur lesquels les protocoles de communications sont différents. En effet, il faut un certain délai pour chaque téléchargement de logiciel de fonctionnement.

Le délai de téléchargement peut être gênant pour l'abonné.

Un premier but de l'invention est de proposer un dispositif qui permettent non seulement de télécharger le logiciel de fonctionnement d'un terminal mais qui permette en outre des changements fréquents d'un logiciel de fonctionnement à un autre sans délais gênant par l'utilisateur.

Selon l'invention, un dispositif de téléchargement de logiciel pour un terminal de télécommunication raccordé à un réseau de télécommunication par une interface classique appelée interface de raccordement au réseau, ledit terminal comportant un microprocesseur commandant le fonctionne-

ment dudit terminal en exécutant un logiciel dit de fonctionnement, est caractérisé en ce qu'il comporte en outre :

- une pluralité de mémoires vive pour mémoriser plusieurs logiciels de fonctionnement;
- au moins une interface de téléchargement pour recevoir, et inscrire dans une mémoire vive, un logiciel de fonctionnement;
- une mémoire morte stockant un logiciel de téléchargement.
- des moyens pour sélectionner l'une de ces mémoires vives en écriture, pour télécharger un logiciel différent dans chacune de ces mémoires vives; et pour sélectionner l'un de ces mémoires vives en lecture, pour exécuter l'un de ces logiciels dans le microprocesseur.

Le dispositif ainsi caractérisé permet de changer le logiciel de fonctionnement sans avoir à le télécharger à chaque fois. Il simplifie donc l'adaptation d'un radiotéléphone ou d'un téléphone sans fil, à un changement de réseau. L'adaptation consiste seulement à sélectionner l'une des mémoires, si le logiciel correspondant à la zone où est situé le terminal, a déjà été téléchargé antérieurement.

Que le terminal comporte une seule mémoire ou plusieurs mémoires vives pour stocker un ou plusieurs logiciels de fonctionnement, il est nécessaire de relier ce terminal à un centre fournissant les logiciels à télécharger. Un moyen connu consiste à utiliser l'interface classique de raccordement du terminal au réseau de télécommunication, le logiciel à télécharger étant acheminé par ledit réseau via l'interface classique. Le dispositif ainsi caractérisé a pour avantage d'être particulièrement simple puisqu'il ne nécessite pas de rajouter une interface supplémentaire. Mais il a pour inconvénient de soumettre le téléchargement aux limitations du canal de transmission habituelle du terminal. Par exemple, le débit du téléchargement d'un radio-téléphone est limité par le débit de son canal vocal ou de son canal de signalisation.

Un second but de l'invention est de proposer un dispositif de téléchargement qui n'ai pas cet inconvénient. Un second objet de l'invention est un dispositif de téléchargement pour un radiotéléphone, ledit radiotéléphone comportant :

- un microprocesseur commandant le fonctionnement dudit radiotéléphone en exécutant un logiciel dit de fonctionnement;
- au moins une mémoire vive pour mémoriser au moins un logiciel de fonctionnement;
- au moins une interface de téléchargement pour recevoir, et inscrire dans une mémoire vive, un logiciel de fonctionnement;
- une mémoire morte stockant un logiciel de téléchargement;

caractérisé en ce que l'interface de téléchargement

est une interface spécifique pour le téléchargement constituée d'une interface permettant de raccorder ledit radiotéléphone à un accès normalisé d'un réseau numérique à intégration de service, le logiciel à télécharger étant acheminé par ledit réseau, jusqu'à cet accès normalisé.

Le dispositif ainsi caractérisé présente l'avantage de permettre le téléchargement d'un radiotéléphone tout à fait indépendamment du réseau de radiotéléphonie auquel le terminal est relié habituellement, ce qui permet d'éviter toute contrainte imposée par ce dernier, telle qu'une limitation du débit des informations transmises pour le téléchargement, ou telle que l'occupation d'un canal de transmission, pendant toute la durée nécessaire au téléchargement du logiciel.

L'invention sera mieux comprise et d'autres détails apparaîtront à l'aide de la description ci-dessous, et des figures l'accompagnant :

- les figures 1 à 3 représentent respectivement les schémas synoptiques de trois exemples de radiotéléphone comportant respectivement trois exemples de réalisation du dispositif selon l'invention;
- les figures 4 et 5 représentent respectivement les schémas synoptiques de deux exemples de terminaux fixes de réseau numérique à intégration de services, comportant respectivement deux exemples de réalisation du dispositif selon l'invention.

Le radiotéléphone 9 représenté sur la figure 1 comporte : une première mémoire vive 1; une seconde mémoire vive 2; une mémoire morte 3 stockant un logiciel de téléchargement; un microprocesseur 4; et une interface radio 5. Tous ces moyens sont reliés entre eux par un bus. Le radiotéléphone 9 est en relation radio avec une station de base, 8, reliée à un réseau de radiotéléphonie 7. L'interface radio 5 est une interface classique permettant au radiotéléphone de communiquer avec la station de base 8, mais elle est en outre utilisée pour télécharger un logiciel de fonctionnement, dans l'une des deux mémoires vives, 1 et 2. Les opérations de téléchargement sont réalisées par le microprocesseur 4 en exécutant le logiciel de téléchargement stocké dans la mémoire morte 3.

La présence de deux mémoires vives, 1 et 2, permet de stocker deux logiciels différents correspondant par exemple au logiciel en cours de validité et à un autre logiciel qui remplacera le précédent à une date prédéterminée. Ou bien, ces deux logiciels correspondent à deux types de réseau différents, exploités dans des pays différents. Naturellement, cet exemple n'est pas limitatif et il est possible de prévoir un plus grand nombre de mémoires vives, si la diversité des réseaux conduit à utiliser plus de deux logiciels différents.

Le radiotéléphone 9 comportant une pluralité

de mémoires vives, 1 et 2, il est prévu des moyens pour sélectionner l'une de ces mémoires vives en écriture, en vue de télécharger un logiciel différent dans chacune de ces mémoires vives; et des moyens pour sélectionner l'une de ces mémoires vives en lecture, pour exécuter seulement l'un de ces logiciels.

Les moyens pour sélectionner l'une des deux mémoires vives, en écriture, sont constitués essentiellement par le microprocesseur 4, commandé par : le logiciel de téléchargement contenu dans la mémoire morte 3, ou par un module prévu dans chaque logiciel de fonctionnement.

Lorsqu' aucun logiciel de fonctionnement n'est présent dans les mémoires vives, la sélection en écriture est commandée par le microprocesseur 4 en fonction des instructions du logiciel de téléchargement. Le logiciel de téléchargement fournit en outre des instructions pour permettre au radiotéléphone d'établir une liaison radio, puis télécharger un logiciel par cette liaison.

L'exécution du logiciel de téléchargement est lancée : soit par un message fourni par le réseau 7, soit par un ordre de l'utilisateur, au moyen d'un clavier incorporé au radiotéléphone 9 et non représenté.

La sélection du logiciel à exécuter pour le fonctionnement habituel, c'est-à-dire la sélection de l'une des deux mémoires vives en lecture est commandée soit par un message envoyé par le réseau 7, soit par un ordre donné par l'utilisateur.

Chaque logiciel de fonctionnement comporte un module pour prendre en compte : un message du réseau 7; ou un ordre de l'utilisateur; et l'identité des logiciels éventuellement stockés dans les deux mémoires vives, 2 et 3; et pour en déduire quelle mémoire vive doit être sélectionnée, en écriture ou en lecture.

L'interface radio définie par le Groupe Spécial Mobile de la Conférence Européenne des Télécommunications, prévoit des canaux de transmission de données entre le réseau et les radiotéléphones mobiles, pour une transmission de point à point ou une diffusion générale. Ces canaux autorisent un débit pouvant atteindre 9,6 kbits par seconde.

La diffusion générale est utilisable pour mettre à jour simultanément les logiciels des radiotéléphones de tout un parc. Au contraire, la transmission de point à point est utilisable pour télécharger un radiotéléphone particulier qui entre dans une zone géographique desservie par un réseau nécessitant l'exécution d'un logiciel de fonctionnement, qui n'est pas déjà stocké dans l'une des mémoires vives du radiotéléphone.

Le téléchargement est lancé à l'initiative du réseau, après analyse d'un paramètre appelé "Classmark Update" contenu dans un message

appelé "Loc Upd Request" envoyé par le radiotéléphone mobile pour initialiser une procédure dite de localisation, lorsqu'il entre dans la nouvelle zone. Ce paramètre indique la version du radiotéléphone. Il indique si ce radiotéléphone est téléchargeable et quel type de téléchargement il est susceptible d'accepter : partiel, pour certaines fonctions; ou total, pour toutes les fonctions sauf la localisation et le téléchargement. Le réseau 7 lance le téléchargement en envoyant au radiotéléphone 9, par radio, un message qui est interprété par le microprocesseur 4 en exécutant un module adéquat du logiciel de fonctionnement, qui est en cours d'exécution à l'instant considéré. Une fois l'opération de téléchargement terminée, la procédure de localisation est terminée. Le radiotéléphone dispose alors de toutes les informations nécessaires pour fonctionner dans la nouvelle zone.

La réalisation du logiciel de téléchargement est à la portée de l'Homme de l'Art. La partie assurant le chargement des mémoires vives est analogue au logiciel d'amorçage (bootstrap en anglais) utilisé pour charger un logiciel d'une disquette vers la mémoire centrale d'un ordinateur. La partie assurant l'établissement d'une liaison radio est une version simplifiée d'un logiciel classique commandant le fonctionnement d'un radiotéléphone.

Cette première variante du dispositif selon l'invention a pour avantage d'être simple et peu coûteuse, puisqu'il suffit de munir le radiotéléphone d'au moins une mémoire vive, et d'une mémoire morte contenant un logiciel de téléchargement, sans interface supplémentaire par rapport à un radiotéléphone classique. Les téléchargements de plusieurs terminaux peuvent être réalisés simultanément, ce qui permet une mise à niveau d'une partie ou de l'ensemble des terminaux d'un réseau de radiotéléphonie, en une seule opération. La diffusion de corrections d'un logiciel, ou le remplacement complet d'un logiciel est donc facile.

La figure 2 représente le schéma synoptique d'un radiotéléphone 10 comportant un second exemple de réalisation du dispositif selon l'invention. Le radiotéléphone 10 comporte : deux mémoires vives 11 et 12; une mémoire morte 13 contenant le logiciel de téléchargement; un microprocesseur 14; une interface radio classique 15; une interface de lecteur de carte à puce, 16; et un lecteur de carte à puce, 17. Les moyens 11 à 16 sont reliés entre eux par un bus.

L'interface de téléchargement est une interface spécifique, indépendante de l'interface radio 15, et constituée de l'interface de lecteur de carte à puce, 16. Cette variante de réalisation permet de télécharger un logiciel indépendamment du réseau de radiotéléphonie, ce qui présente l'avantage d'éviter les contraintes de celui-ci. D'autre part un logiciel de téléchargement par carte est plus simple qu'un

logiciel de téléchargement par relation radio, celle-ci nécessitant une procédure complexe pour son établissement. Le téléchargement est commandé par l'utilisateur au moyen d'un clavier incorporé au radiotéléphone 10, après que l'utilisateur ait introduit une carte à puce 18 dans le lecteur de carte à puce 17. La sélection de l'une des deux mémoires vives, 11 ou 12, en écriture est commandée par l'utilisateur au moyen de son clavier. La sélection de l'une des deux mémoires vives en lecture est commandée soit par l'utilisateur, soit par un module du logiciel de fonctionnement, en cours d'exécution, de la façon décrite précédemment pour le radiotéléphone 9, par exemple lors d'un changement de zone géographique.

Il est possible de réaliser un logiciel de téléchargement permettant un téléchargement alternativement par l'interface radio 15, comme décrit pour le radiotéléphone 9, ou par le lecteur de carte 17, comme décrit ci-dessus pour le radiotéléphone 10.

La carte à puce 18 est distribuée aux usagers par l'opérateur du réseau, soit directement par courrier, soit par l'intermédiaire d'un circuit de distribution telles que des agences commerciales, ou des commerces classiques. Il est à remarquer que le lecteur de carte à puce peut être remplacé par un lecteur de carte magnétique.

La figure 3 représente le schéma synoptique d'un radiotéléphone 20 comportant un troisième exemple de réalisation du dispositif selon l'invention. Il comporte : deux mémoires vives, 21 et 22; une mémoire 23 stockant un logiciel de téléchargement; un microprocesseur 24; une interface radio classique 25; et une interface 26 de raccordement à un accès normalisé d'un réseau numérique à intégration de services, 57. Le radiotéléphone 20 établit une liaison radiotéléphonique avec une station de base 59, reliée à un réseau de radiotéléphonie 58. Ce dernier est relié au réseau numérique à intégration de services, 57. Les moyens 21 à 26 sont reliés entre eux par un bus. L'interface radio 25 peut établir une relation radio avec la station de base 59 pour la transmission de signaux téléphoniques, par contre le téléchargement de logiciel est effectué au moyen d'un câble reliant temporairement l'interface 26 à un accès normalisé du réseau 57. Ce câble est muni d'un connecteur mâle normalisé 27 pouvant inséré dans un connecteur femelle normalisé 28 relié au réseau 57.

Quand l'utilisateur décide de télécharger un logiciel dans son radiotéléphone 20, il sélectionne en écriture l'une des deux mémoires vives, 21 ou 22, au moyen d'un clavier, après avoir connecté le câble reliant l'interface 26 au réseau 57. La sélection en lecture de l'une des deux mémoires vives, 21 ou 22, est réalisée de manière analogue à celle décrite pour le radio téléphone 9.

Cette variante a pour avantage d'utiliser un moyen de transmission du logiciel qui est plus facilement disponible qu'une carte à puce, dans la mesure où le nombre d'accès au réseau 57 est très élevé.

La figure 4 représente le schéma synoptique d'un terminal fixe 30 pour réseau numérique à intégration de services, ce terminal 30 comportant un quatrième exemple de réalisation du dispositif selon l'invention. Le terminal 30 comporte deux mémoires vives, 31 et 32, pour stocker respectivement deux logiciels de fonctionnement, différents, inscrits par téléchargement; une mémoire morte 33 stockant en permanence un logiciel de téléchargement; un microprocesseur 34; et une interface 35, de raccordement à un réseau numérique à intégration de services, constituant aussi une interface de téléchargement des logiciels de fonctionnement.

L'interface 35 est reliée en permanence à un accès normalisé d'un réseau numérique à intégration de services, 38, par un câble muni d'un connecteur mâle normalisé 36 enfiché dans un connecteur femelle normalisé 37 raccordé au réseau 38. Cette variante de réalisation, a pour avantage que les logiciels de fonctionnement sont téléchargés par l'intermédiaire d'une interface classique 35, ce qui évite de rajouter une interface spécifique.

Chaque accès normalisé 37 comporte un canal dit de signalisation d'utilisateur à usager, et plusieurs canaux pour la transmission proprement dite, acheminant des signaux vocaux, par exemple. Le téléchargement d'un logiciel peut être réalisé par l'intermédiaire de l'un de ces deux types de canaux, ou bien en combinant les deux; les canaux de transmission étant utilisés pour transmettre le logiciel à télécharger, et le canal de signalisation étant utilisé pour initialiser et pour conclure le téléchargement.

Le téléchargement de l'une des mémoires vives, 31 ou 32, est lancé par l'utilisateur, au moyen d'un clavier, ou par le logiciel de fonctionnement en cours d'exécution, lorsqu'il reçoit un ordre de téléchargement envoyé par le réseau 38. Chaque logiciel de fonctionnement comporte un module pour prendre en compte : un ordre de l'utilisateur, ou un ordre du réseau 38. La sélection de l'une des deux mémoires vives en écriture ou en lecture est commandée par le microprocesseur 34, en fonction des instructions du logiciel de téléchargement et en fonction des ordres donnés par l'utilisateur ou par le réseau.

Le téléchargement d'un nouveau logiciel de fonctionnement et le basculement d'un logiciel ancien au logiciel nouveau peuvent être entièrement télécommandés par l'opérateur du réseau 38, sans intervention de l'utilisateur.

La figure 5 représente le schéma synoptique

d'un autre exemple de terminal fixe, 40, pour réseau numérique à intégration de services, 51, ce terminal comportant un dispositif de téléchargement selon la seconde variante. Ce terminal 40 comporte : deux mémoires vives, 41 et 42, pour stocker respectivement deux logiciels de fonctionnement, différents, qui sont téléchargés; une mémoire morte 43 stockant en permanence un logiciel de téléchargement; un microprocesseur 44; une interface 45 de raccordement à un réseau numérique à intégration de services; une interface 46 pour lecteur de carte à puce; et un lecteur de carte à puce 47. Les moyens 41 à 46 sont reliés entre eux par un bus.

L'interface 45 est une interface classique reliée en permanence à un réseau numérique à intégration de services, 51, au moyen d'un câble muni d'un connecteur mâle normalisé, 49, enfiché dans un connecteur femelle normalisé, 50, relié au réseau 51. Le lecteur 47 de carte à puce est relié à une entrée de l'interface 46. Pour télécharger un logiciel de fonctionnement, l'utilisateur sélectionne l'une des deux mémoires vives, 41 ou 42, au moyen d'un clavier non représenté, puis introduit une carte à puce 48 dans le lecteur 47. La sélection de l'une des deux mémoires vives en lecture est réalisée de manière analogue à celle décrite précédemment, pour le terminal 30.

Il est possible de prévoir un logiciel de téléchargement permettant de télécharger alternativement par le réseau 51 ou par une carte 48, en fonction des circonstances. Le lecteur 47 peut être remplacé par un lecteur de carte magnétique.

La portée de l'invention n'est pas limitée aux exemples décrits ci-dessus. Elle est applicable à tout autre terminal de télécommunication comportant un microprocesseur, si la complexité de son logiciel et son évolution dans le temps justifient de changer occasionnellement ce logiciel.

Revendications

1. Dispositif de téléchargement de logiciel pour un terminal de télécommunication (9) raccordé à un réseau de télécommunication (7) par une interface classique (5) appelée interface de raccordement au réseau, ledit terminal comportant un microprocesseur (4) commandant le fonctionnement dudit terminal (9) en exécutant un logiciel dit de fonctionnement; caractérisé en ce qu'il comporte en outre :
 - une pluralité de mémoires vive (1, 2) pour mémoriser plusieurs logiciels de fonctionnement;
 - au moins une interface de téléchargement (5) pour recevoir, et inscrire dans une mémoire vive (1, 2), un logiciel de fonctionnement;

- une mémoire morte (3) stockant un logiciel de téléchargement.
 - des moyens (4) pour sélectionner l'une de ces mémoires vives en écriture, pour télécharger un logiciel différent dans chacune de ces mémoires vives; et pour sélectionner l'une de ces mémoires vives en lecture, pour exécuter l'un de ces logiciels dans le microprocesseur (4).
2. Dispositif selon la revendication 1, caractérisé en ce que les moyens pour sélectionner (4) sont commandés par un message du réseau, acheminé par l'interface (5) de raccordement au réseau de télécommunication (7).
3. Dispositif selon la revendication 2, caractérisé en ce que les moyens pour sélectionner (4) sont commandés au moyen d'un clavier manipulé par l'utilisateur du terminal (9).
4. Dispositif pour télécharger un logiciel dans un radiotéléphone (20), caractérisé en ce qu'il comporte une interface spécifique pour le téléchargement constituée d'une interface (26) permettant de raccorder ledit radiotéléphone (20) à un accès normalisé (28) d'un réseau numérique à intégration de service (57), le logiciel à télécharger étant acheminé par ledit réseau, jusqu'à cet accès normalisé (28).

5

10

15

20

25

30

35

40

45

50

55

6

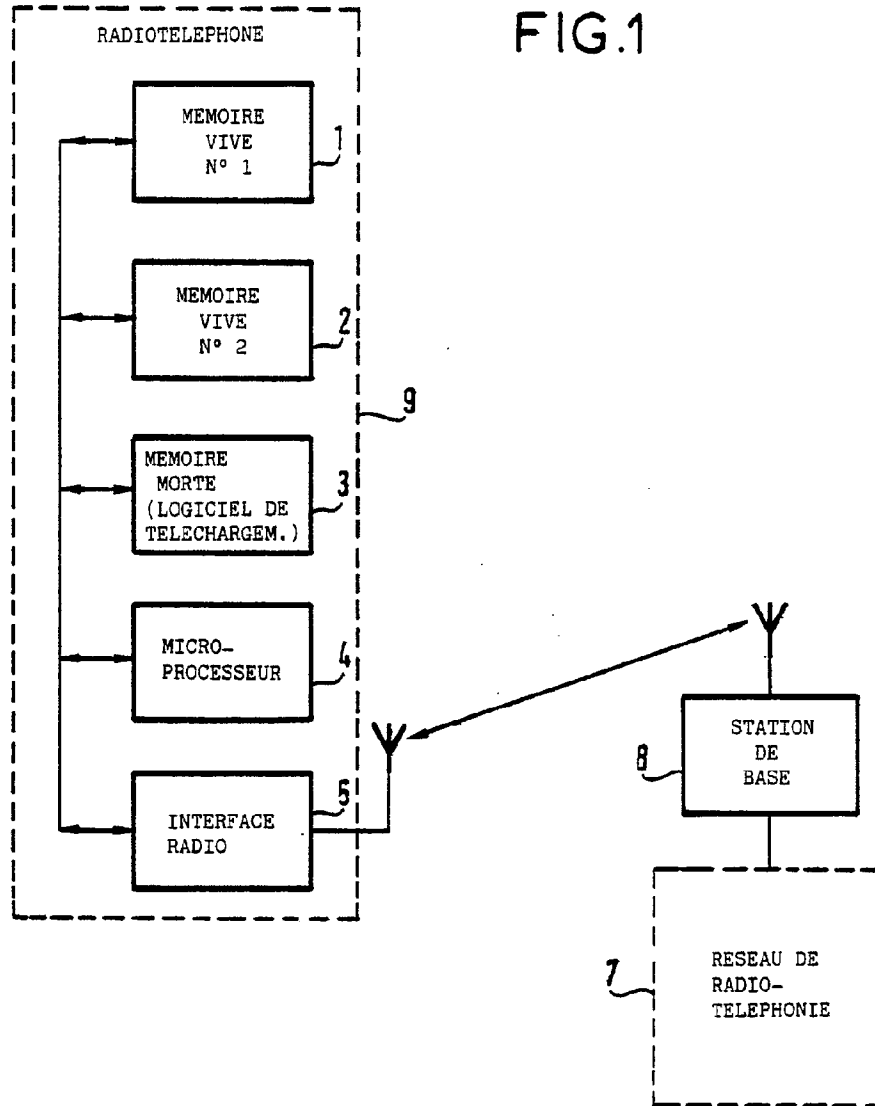


FIG. 2

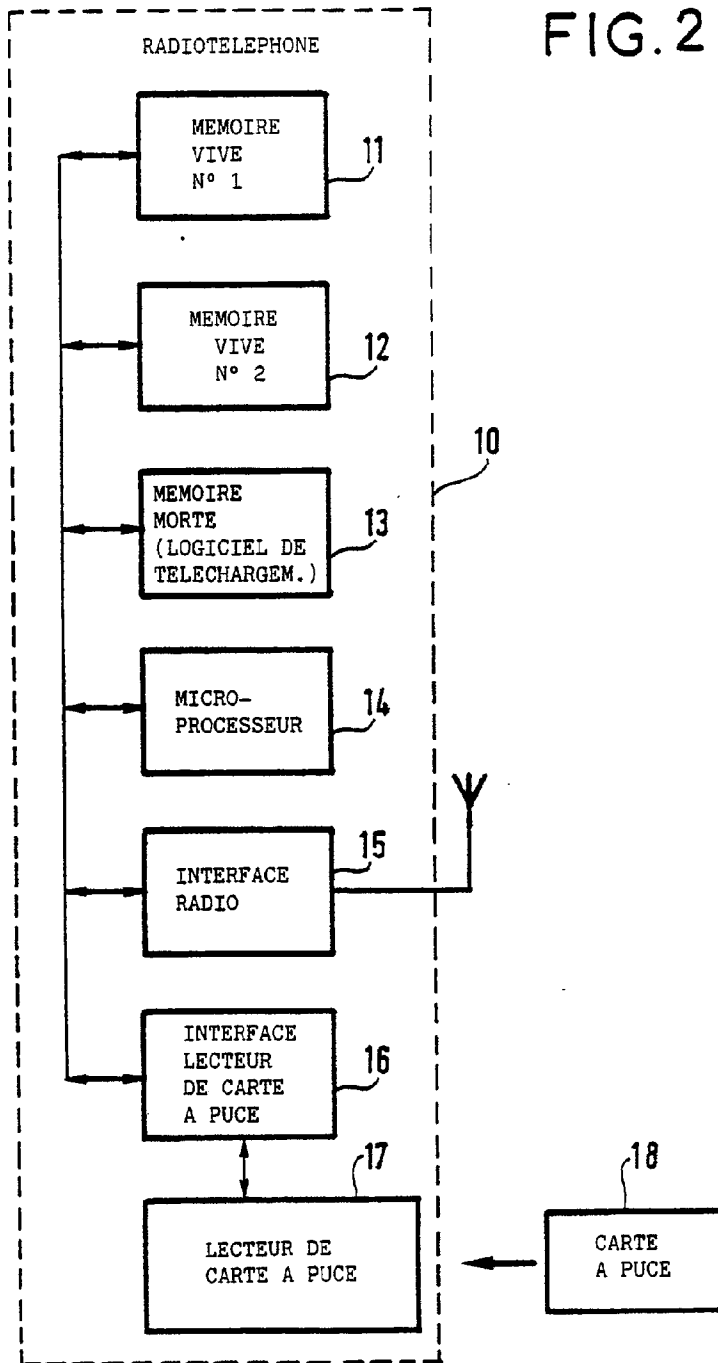


FIG.3

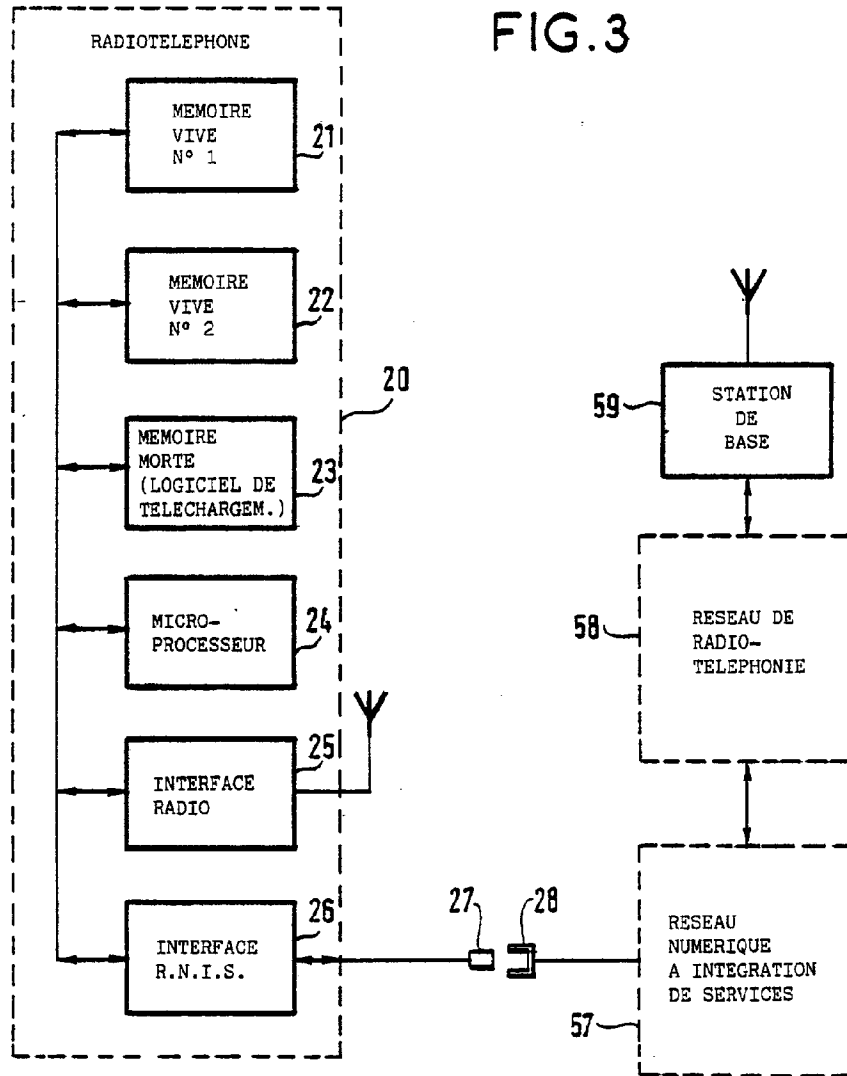


FIG. 4

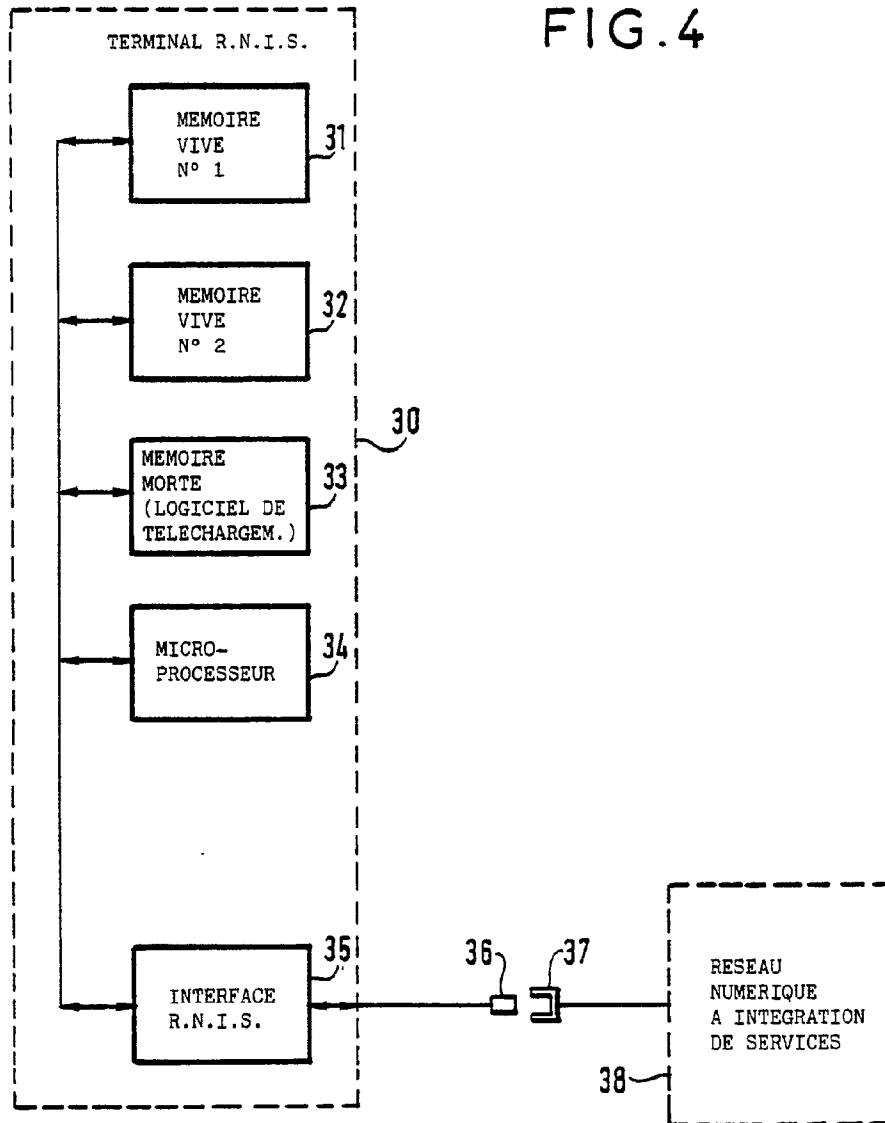
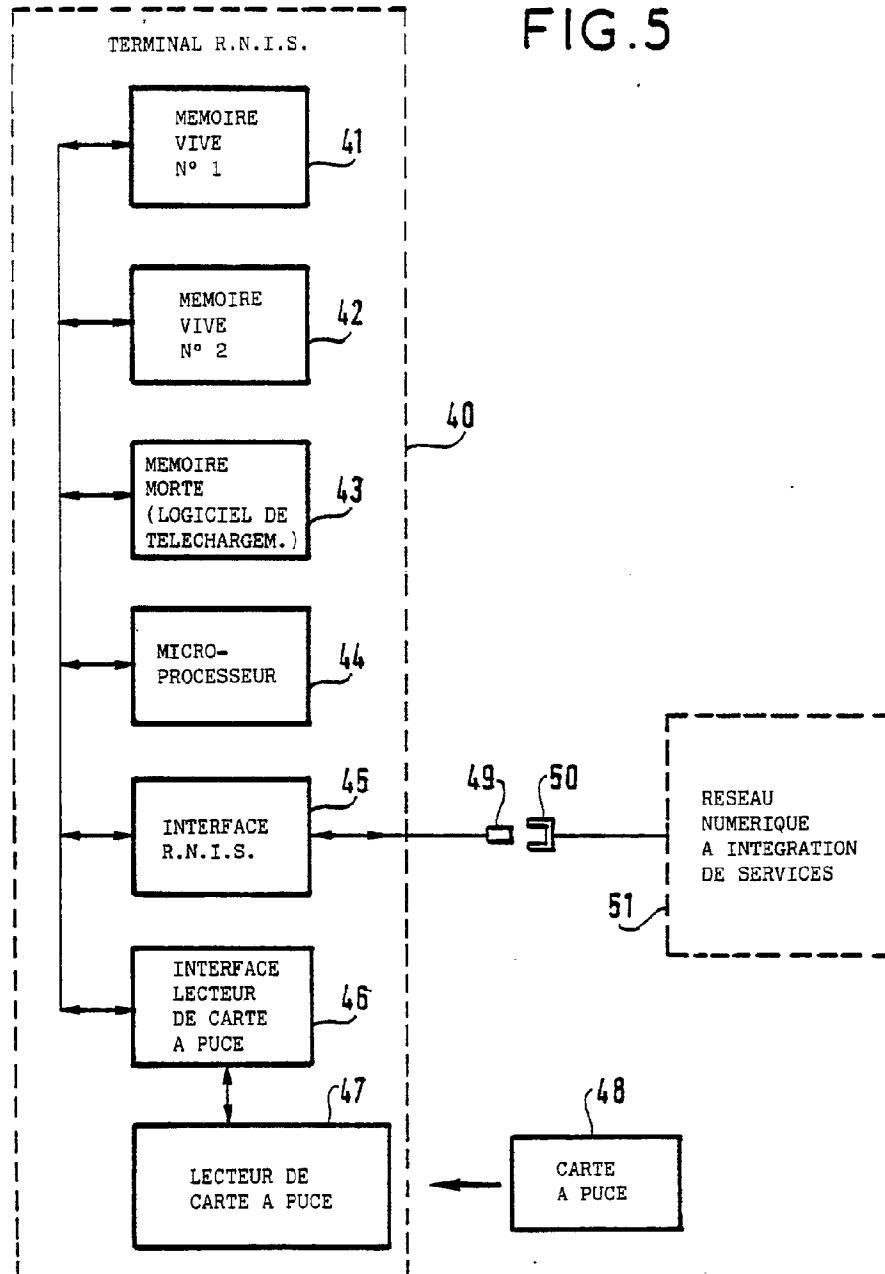


FIG.5





DOCUMENTS CONSIDERES COMME PERTINENTS			
Catégorie	Citation du document avec indication, en cas de besoin, des parties pertinentes	Revendication concernée	CLASSEMENT DE LA DEMANDE (Int. Cl.5)
Y	PROCEEDINGS OF THE NATIONAL COMMUNICATIONS FORUM, vol. 42, no. 2, 30 septembre 1988, pages 1706-1713; P.E. JACKSON et al.: "Portable communication" * Page 1708, colonne de droite, lignes 29-34; page 1709, colonne de gauche, lignes 44-54; figure 1 *	1	H 04 Q 7/04
A	IDEM - - - -	2-4	
Y	EP-A-0 297 616 (S.E.L.) * Résumé, colonne 3, lignes 23-32; figure 1 *	1	
A	- - - -	2-3	
A	EP-A-0 369 110 (BOSCH) * Page 2, colonne 2, lignes 17-20,42-46; colonne 3, lignes 18-25; fig.* - - - -	1	
A	US-A-4 736 409 (HASEGAWA) * Colonne 1, ligne 60 - colonne 2, ligne 2; colonne 5, lignes 29-37 * - - - -	1	
A	PHILIPS TDS REVIEW, vol. 45, no. 2, juin 1987, pages 10-26, Eindhoven, NL; J.F. BRIEND et al.: "French PTT MINITEL and LECAM programme" * Page 18, ligne 35- page 21; ligne 20 * - - - -	1	DOMAINES TECHNIQUES RECHERCHES (Int. Cl.5) H 04 Q H 04 M
A	DE-A-3 815 071 (LOEWE OPTA) * Colonne 4, lignes 6-24 * - - - - -	1-4	
Le présent rapport de recherche a été établi pour toutes les revendications			
Lieu de la recherche		Date d'achèvement de la recherche	Examineur
La Haye		12 août 91	DE LA FUENTE DEL AGU
<p>CATEGORIE DES DOCUMENTS CITES</p> <p>X : particulièrement pertinent à lui seul Y : particulièrement pertinent en combinaison avec un autre document de la même catégorie A : arrière-plan technologique O : divulgation non-écrite P : document intercalaire T : théorie ou principe à la base de l'invention</p> <p>E : document de brevet antérieur, mais publié à la date de dépôt ou après cette date D : cité dans la demande L : cité pour d'autres raisons & : membre de la même famille, document correspondant</p>			



Espacenet

Bibliographic data: EP0459344 (A1) — 1991-12-04

Software download device for a communication terminal.

Inventor(s): BALLARD MICHEL [FR]; ISSENMANN EDOUARD [FR] ±
(BALLARD, MICHEL, ; ISSENMANN, EDOUARD)

Applicant(s): CIT ALCATEL [FR] ± (ALCATEL CIT)

Classification: - **international:** H04M1/725; H04W8/24; H04W88/06; (IPC1-7): H04Q7/04
- **cooperative:** H04M1/72525; H04W8/245; H04W88/06

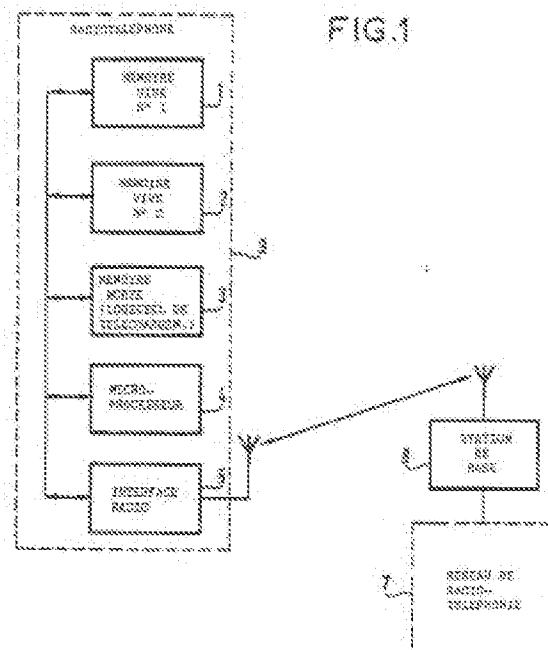
Application number: EP19910108566 19910527

Priority number (s): FR19900006710 19900530

Also published as: FR2662891 (A1) AU7739591 (A) AU643526 (B2)

Abstract of EP0459344 (A1)

The invention relates to a device for downloading a telecommunication terminal, for example a radio telephone (9), so as to change its operating software, without the user of this radio telephone having to take it to a commercial agency of the operator of the radio telephone network. In an embodiment, each radio telephone includes: - a plurality of random-access memories (1, 2) for storing various items of operating software; - a read-only memory (3) storing an item of downloading software; - a microprocessor (4) executing either the downloading software, or one of the operating programs; - a conventional radio interface (5) used, on the one hand, as



downloading interface, and on the other hand, for the conventional radio telephone links. Application to all telecommunication terminals containing a microprocessor, in particular the terminals distributed in great numbers among the public.



Consommation
et Corporations Canada

Consumer and
Corporate Affairs Canada

Bureau des brevets

Patent Office

Ottawa, Canada
K1A 0C9

(11)	(C)	1,296,068
(21)		514,800
(22)		1986/07/28
(45)		1992/02/18
(52)		326-12.2
C.L.	CR.	340-71
		354-22

(51) INTL.CL.⁵ A61B-5/00

(19) (CA) **CANADIAN PATENT** (12)

(54) Physiological Monitoring System

(72) Friesen, Edward J. , Canada

(73) Same as inventor

(57) 4 Claims

Canada

CCA 3254 (10-89) 41

ABSTRACT OF THE DISCLOSURE

Physiological monitoring systems for measuring variables such as, for example the temperature or pulse rate in animals usually include a sensor for attachment to the animal, and a telemetry unit for receiving a signal from the sensor indicative of the value being measured. It is necessary to be close to the subject being monitored, and values are obtained on an intermittent basis. By providing a transmitter/receiver, a microcomputer, a source of power and at least one sensor in a remote telemetry unit, and a transmitter/receiver, a source of power and a computer in a master telemetry unit the subject can be continuously monitored, the data being stored in the microcomputer and periodically transmitted to the computer of the master telemetry unit either automatically or in response to a command for such data.

1296068

This invention relates to a physiological monitoring system.

Physiological monitoring systems are not new. Examples of such systems are found in Canadian Patents Nos. 738,747, issued to R.J. Preston on July 19, 1966; 801,875, issued to F.R. Anderholm et al on December 17, 1968; 886,724, issued to N. Murata on November 23, 1971; 940,433, issued to C.H. Fuller on December 23, 1975; 1,027,181, issued to R.A. Lewis on February 28, 1978; 1,043,425, issued to D.G. Noiles on November 28, 1978; 1,105,562, issued to P. Schmidt-Andersen on July 21, 1981; 1,128,138, issued to M. Toshimitsu et al on July 20, 1982, and U.S. Patents Nos. 3,212,495, issued to R.J. Preston on October 19, 1965; 4,237,900, issued to J.H. Schulman et al on December 9, 1980; 4,249,538, issued to T. Musha et al on February 10, 1981; 4,321,933, issued to L.R. Baessler on March 30, 1982; 4,456,825, issued to G.J. Veith on November 2, 1982; 4,387,724, issued to D.L. Zartman on June 14, 1983; 4,399,821, issued to D.L. Bowers on August 23, 1983 and 4,531,526, issued to L.J. Genest on July 30, 1985.

In general, physiological monitoring systems have been used for some time to provide management information for animal operations. The principle objective has been to identify the individual animals, and to provide some means for monitoring temperature and heart rate. The systems employ a variety of probes which may be subdermally implanted, located close to the tympanic membrane, or mounted in the vagina for detecting temperature.



Some probes are not internally powered, so that they must be actuated using an external source of power located close to the probe. Such passive probes transmit data only when interrogated. Even in cases where the probe constantly monitors a condition,
5 e.g. using battery operated probes, information is obtained only upon actuating a transmitter/receiver. Thus, information not gathered at the moment of transmission is lost. A problem common to all such devices is that continuous remote monitoring is in general not possible.

10 The object of the present invention is to overcome the drawbacks of existing apparatuses by providing a relatively simple physiological monitoring system, which is capable of measuring physiological functions such as pulse rate and temperature in a living creature, storing the data, and transmitting the data
15 complete with an identification code via a radio telemetry link.

Accordingly, the present invention relates to a physiological monitoring system comprising remote telemetry means for attachment to the subject to be monitored including sensor means for detecting a condition of the subject, first microcomputer
20 means connected to said sensor means for storing data concerning the sensed condition, and first transmitter/receiver means for transmitting a signal representative of the condition and for receiving command signals; and master telemetry means for communicating with said remote telemetry system including second
25 computer means for storing data and for generating a command

signal, and second transmitter/receiver means for transmitting command signals to said remote telemetry unit, and for receiving data from said first microcomputer.

5 The invention will now be described in greater detail with reference to the accompanying drawings which illustrate preferred embodiments of the invention, and wherein:

Figure 1 is a schematic block diagram of a remote telemetry unit for use in the system of the present invention;

10 Figure 2 is a schematic block diagram of a master telemetry unit for use in the system of the present invention; and

Figure 3 is a schematic block diagram of another form of remote telemetry unit for use in the system of the present invention.

15 With reference to Figs. 1 and 2, the basic elements of the present invention include a remote telemetry unit (Fig. 1) and a master telemetry unit (Fig. 2). The remote telemetry unit is externally or internally attached to the animal to be monitored. The master telemetry unit functions as a base station for collecting and processing data received from one or more remote telemetry units
20 during operation of the latter.

The remote telemetry unit includes a microcomputer 1 for collecting data from one or more sensors 2. The sensors 2 are connected directly to the microcomputer 1. Alternatively,
25 the sensors can be connected to an analog to digital converter 3,

or to a multiplexer 5 which is connected directly to the micro-
computer 1 or through an analog to digital converter 6 to the
microcomputer 1. The microcomputer 1 is operated by a power
supply 7. A transmitter/receiver 8 carrying an antenna 9 is
5 connected to the microcomputer. The transmitter/receiver 8
receives command signals via the antenna 9 from the master
telemetry unit, and transmits data from the microcomputer 1 to
the master telemetry unit.

Examples of the microcomputer 1 include CPU, RAM's,
10 ROM's and EPROM's, which collect data from the sensors 2, stores
the data, performs monitoring routines, and controls transmission
of the data to the master telemetry unit. The sensors 2, which
are forms of transducers, measure the appropriate physiological
function such as pulse rate, temperature and respiration rate,
15 and transmit data to the microcomputer. The power supply 7 is
a compact power supply, e.g. a battery, so that the entire remote
telemetry unit can be attached internally, subcutaneously or
externally to the subject being monitored.

The entire remote telemetry unit is contained in a
20 single package. Very large scale integration (VLSI) is used
to make the remote telemetry unit as small as possible, and to
keep manufacturing costs as low as possible. The manner of
attaching the remote telemetry unit to the subject depends on the
use or application. Mounting of the remote telemetry unit
25 subcutaneously possesses the advantage of utilizing the skin

for mechanical protection of the remote telemetry unit. Alternatively, the remote telemetry unit can be injected into the digestive tract of the subject when the physiological functions to be determined require such form of sensing. In cases where
5 relatively short term sensing, or when there is no need for mechanical protection, the remote telemetry unit can be attached to the surface of the skin using an adhesive. For internal or subcutaneous use, the remote telemetry unit can be in the form of a small cylinder (one inch by one-quarter inch). For surface
10 mounting on the skin, the remote telemetry unit can be a thin disc with an adhesive backing. The antenna 9 can be integral with or external to the remote telemetry unit, and in the case of subcutaneous use can extend through the skin of the subject.

With reference to Fig. 2, the master telemetry unit
15 includes a computer 10 connected to a transmitter/receiver 12 on which is mounted an antenna 13. The transmitter/receiver 12 sends command signals to the transmitter/receiver 8 of the remote telemetry unit, and receives stored data from the micro-computer 1 via the transmitter/receiver 8. The usual auxillary
20 equipment, including an LED (light emitting diode) readout device 14, a monitor 15, a printer 16 and a disc storage device 17 are attached to the computer 10.

Referring to Fig. 3, an alternative form of remote
telemetry unit includes a computer 40 connected to sensors 42
25 and 43 (one of each shown). The digital sensors 42 are connected

1296068

directly to the computer, while the analog sensors are connected through an analog/digital converter 44 to the computer 40. The microcomputer 40 is connected through a grounded interface 46, a quad line receiver 47, operational
5 amplifiers 48 and 49, a voltage/frequency converter 50, operational amplifier 52, relay 53 and an isolating transformer 54 to the transmit circuit of a communications unit 56. Lines 58 and 59 bypass the amplifiers 48 and 49, the converter 50 and the amplifier 52, connecting the quad
10 line receiver 47 directly to a universal asynchronous receiver/transmitter (UART) 60 and a read only memory (ROM) 61, and connecting the latter to the relay 53. A rate generator 64 is connected to the UART 60.

The computer 40 is also connected through the
15 interface 46, a quad line driver 65, a Schmidt trigger 66, an operational amplifier 68, a frequency voltage converter 69, a Schmidt trigger 70, an operational amplifier 72, a relay 73 and an isolating transformer 74 to the receive circuit of the communications unit 56. As in other
20 embodiments, an antenna 57 is provided on the communications unit 51. A line 77 connects the ROM 61 to the relay 73.

While not illustrated, the master telemetry unit can be identical to the unit shown in Fig. 3, except that the
25 computer 40, sensors 42 and 43, and the analog/digital converter 44 are replaced by a computer with peripheral devices, including a

monitor, printer and data storage.

The quad line receiver 47 is a monolithic quad line receiver designed to interface data terminal equipment with data communications equipment in conformance with the specifications of EIA Standard No. RS-232C (see Motorola Semiconductors Data Sheet). The quad line driver 52 is a monolithic quad line driver also designed to interface data terminal equipment with data communications equipment in conformance with the specifications of EIA Standard No. RS-232C. The voltage/frequency converter 48 accepts a variable analog input signal and generates an output pulse train, the frequency of which is linearly proportional to the input voltage. The same device can be used as a frequency to voltage converter 54, which accepts virtually any input frequency wave form and provides a linearly proportional voltage output (see Teledyne Semiconductor Data Sheet). The inverting Schmidt triggers 66 and 70 are circuits having a high voltage output when the input voltage is low. The output voltage remains high while the input voltage increases until the input voltage exceeds set point. The output voltage then switches to its minimum value and holds that value until the input voltage has decreased below set point.

In operation, the computer of the master telemetry unit identifies a remote telemetry unit to be interrogated, either through its software or by operator request. A digital coded signal is sent via the interface 46 to the quad line receiver

1296068

47. The receiver 47 conditions the digital signal to a voltage level acceptable to the digital input voltage signal. The output pulse train is then input to the communications unit 56 via the amplifiers 48 and 49, the voltage/frequency converter 50, the
5 amplifier 52, the relay 53 and the isolating transformer 54. The operational amplifiers 48, 49 and 52, and the voltage/frequency converter 50 are used to condition the signal from the receiver 47 to the transformer 54. The isolating transformer 54 is used to electrically isolate the communications unit from the remainder
10 of the circuit.

The signal from the output of the quad line receiver 47 also goes to the UART 60. The UART 60 receives the serial signal and converts it to a parallel signal which is sent to the ROM 61. The ROM 61 interprets the signal on its address bus (not shown)
15 and if the signal is a command from the computer 40 to transmit, it operates the transmit relay 53 which puts the telemetry unit into the transmit mode of operation. If the transmit signal is not received by the ROM 61, then the ROM operates the receive relay 73 to maintain the master telemetry unit in the receive
20 mode of operation.

The communications unit 56 of the master telemetry unit is normally operated in the receive mode. When the communications unit 56 senses an input to its transmission circuitry, the unit automatically switches to transmit mode and transmits the input
25 data via the antenna 76. When the input data stops, the

communication unit 56 switches back to the receive mode. A suitable communications unit is a Citizen Band transmit/receiver, Julian International Model JWT 603. The unit has voice activated input, and operates at 49.876 megahertz.

5 When a signal is received by a communications unit of the master telemetry unit via the antenna 76, the signal is directed to the receive port through the isolating transformer 74 to the converter 69. The converter 69 converts the input pulse train to a digital voltage output for the quad line driver 65. The driver 65 converts the digital signal to a voltage level in accordance with the standard of the interface 46. The Schmidt triggers 66 and 70, and the amplifiers 68 and 72 are used to condition the signals from the driver 65 to the transformer 74. The signal is then passed to the computer for processing.

10 As mentioned above, the portion of the remote telemetry unit which sends a signal to the communications unit 56 or receives a signal is the same as the master telemetry unit. The data acquisition portion of the remote telemetry unit functions when the analog sensor 43 sends a signal to the analog-to-digital converter 44. The signal is proportional to the phenomena being sensed, e.g. temperature, pressure, voltage, etc. The analog-to-digital converter 44 changes the input analog signal to a digital signal, which is input to the computer 40 for processing. The digital sensor 42 produces a digital signal, which is sent directly to the computer 40 for processing, and can be used with

the analog sensor 43 to act as a switch indicating that an event has occurred.

It will be appreciated that the master telemetry unit is required to communicate with the remote telemetry unit.

5 Consequently the design of the master telemetry unit depends upon whether the unit is portable or stationary, the range required between the two units, the number of remote telemetry units in the system and the type of display required. The transmitter/receiver operates on the same frequency as the remote telemetry
10 unit. The master telemetry unit antenna would be designed to make up for deficiencies in the remote telemetry unit antenna, e.g. a parabolic antenna could be used to receive a weak signal from a remote telemetry unit and to transmit a strong, omnidirectional signal towards the remote telemetry unit.

15 The computers are referred to in the generic sense as any of a multitude of commercially available computers having a suitable interface. Communications between the computers and the transmitter/receiver are via the interface. One of the more important features of the invention is the use of a micro-
20 computer as part of the remote telemetry unit for attachment to the subject to be monitored. The microcomputer controls measurement of physiological variables, stores the measurements, identified transmissions from the master telemetry unit, and controls radio transmission of stored data to the master telemetry,
25 unit. There are various advantages to using a microcomputer in

the remote telemetry unit. Data transmission does not have to be continuous, since the data can be collected and stored in the microcomputer for transmission when instructions are received, at predetermined time intervals or if preset values of specific data are exceeded. Because transmission is controlled, power drain on the battery used as the power supply is minimized or conversely, a smaller battery can be used, and one standard frequency can be used when more than one remote telemetry unit is in operation for the same installation. For example, each remote telemetry unit could transmit for approximately two seconds every twenty-four hours and the master telemetry unit would provide continuous twenty-four hour surveillance. There is no danger of losing data, since the microcomputer can have sufficient storage capacity. A microprocessor complete with the components listed hereinbefore can be sufficiently small for subcutaneous implantation in the subject to be monitored. Using very large scale integration technology, it is likely that the battery used for the power supply would constitute the largest component.

Using the communications link between the remote and master telemetry units, it is possible to calibrate the remote telemetry unit for the specific variables being monitored. For example, in order to calibrate the temperature monitoring system, the remote telemetry unit is immersed in a medium such as water prior to attachment to the subject. The water temperature is measured using a thermometer, the temperature is input manually

into the master telemetry unit, which in turn transmits the temperature to the remote telemetry unit. The microprocessor of the remote telemetry unit is programmed to receive the data, compare it to the measurement taken using the temperature transducer(s),
5 and make the necessary changes to the temperature algorithm used in the microcomputer. Following attachment of the remote telemetry unit to the subject, the temperature, pulse rate, etc. of the subject can be measured using traditional methods, and the data transmitted to the remote telemetry unit. The microprocessor
10 would have the capability of confirming or correcting the algorithm.

When using a microcomputer, each remote telemetry unit can be given a unique digital name or code, which is used when the remote telemetry unit is interrogated, for requesting data transmission from the particular remote telemetry unit or to
15 identify data transmission from a remote telemetry unit.

The system described hereinbefore can be used, inter alia for artificial insemination, live stock performance monitoring, health monitoring and wild animal monitoring. In the livestock industry, data can be collected to determine the
20 estrous cycle in order to increase the probability of successful impregnation. Livestock in test stations and feed lots can be monitored to determine the health, location, feeding habits and weight gain. The monitoring of feeding habits and weight gain would require sensors at feed bunks and load cells to identify
25 the animal. The calving period in commercial cattle operations is

notoriously labour intensive. The system can be used to monitor
the cattle, and provide an alarm when physiological changes
occur to indicate that the cow is in labour or about to give birth.
Branding could be eliminated since each remote telemetry unit has
5 its own unique code used to identify each individual animal.

When used in health monitoring, heart attack or stroke
patients can be monitored in intensive care units and/or during
recovery. The system allows a doctor to monitor a patient
in an environment away from the hospital. If necessary, a pocket
10 carried, rechargeable repeater station can be used to strengthen
transmission of the remote telemetry unit signal. By implanting
a remote telemetry unit in a bird or wild animal, the need
for banding or tagging is eliminated.

15

20

25

THE EMBODIMENTS OF AN INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A physiological monitoring system comprising remote telemetry means for attachment to the subject to be monitored including sensor means for detecting a condition of the subject, first microcomputer means connected to said sensor means for storing data concerning the sensed condition, and first transmitter/receiver means for transmitting a signal representative of the condition and for receiving command signals; and master telemetry means for communicating with said remote telemetry system including second computer means for storing data and for generating a command signal, and second transmitter/receiver means for transmitting command signals to said remote telemetry unit, and for receiving data from said first microcomputer.

2. A monitoring system according to claim 1, wherein said first microcomputer means includes analog/digital converter means, and said sensor means is an analog sensor.

3. A monitoring system according to claim 1, wherein each said remote telemetry means and master telemetry means includes a communications unit containing a transmit circuit and a receive circuit; antenna means connected to said communications unit for transmitting and receiving signals; quad line receiver and voltage/frequency converter means connecting said transmit circuit of the communications unit to said first or second computer means; and frequency/voltage converter means, Schmidt trigger means and quad line driver means connecting said receive circuit to said first or second computer means.

1296068

4. A method of calibrating a remote telemetry unit in a physiological monitoring system of the type including remote telemetry means for attachment to the subject to be monitored including sensor means for detecting a condition of the subject, first microcomputer means connected to said sensor means for storing data concerning the sensed condition, and first transmitter/receiver means for transmitting a signal representative of the condition and for receiving command signals; and master telemetry means for communicating with said remote telemetry system including second computer means for storing data and for generating a command signal, and second transmitter/receiver means for transmitting command signals to said remote telemetry unit, and for receiving data from said first microcomputer, said method comprising the steps of accurately determining a value of the condition to be monitored; manually inputting the value into the master telemetry unit so that the value is transmitted to the remote telemetry unit; and programming the remote telemetry unit to receive the value and to compare such value with the values obtained using said sensor means, and to make the changes to the value algorithm in the first microcomputer means necessary to ensure accurate indication of the value by said system.



15

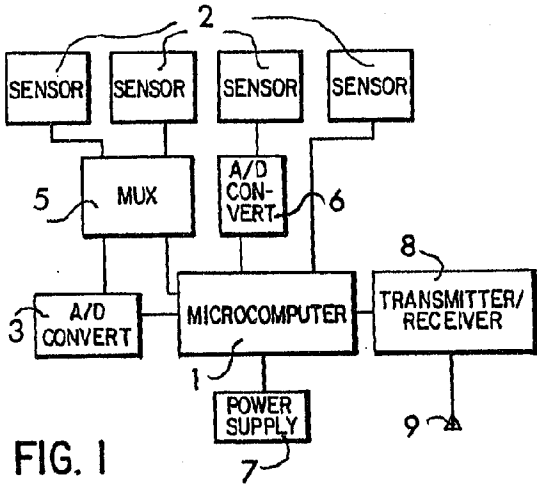


FIG. 1

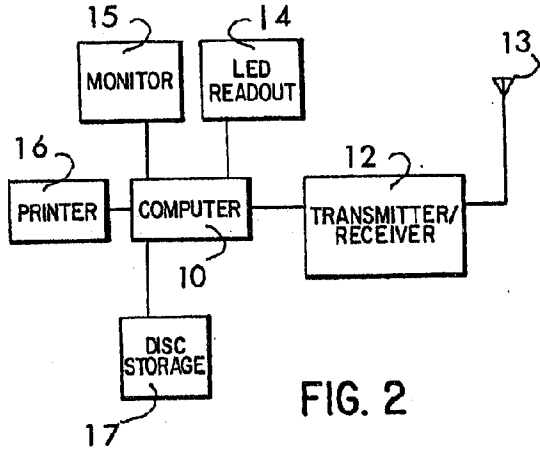


FIG. 2

James W. Paul, Jr.

1296068

2-2

Handwritten signature and scribbles

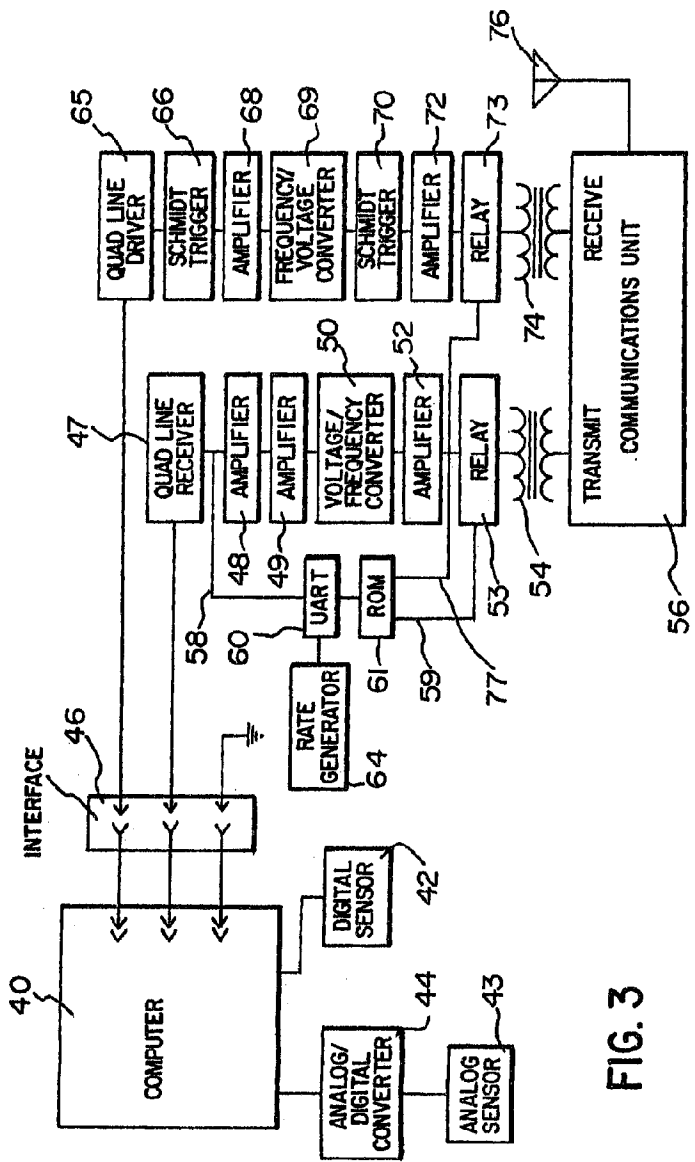


FIG. 3



EUROPEAN PATENT APPLICATION

Application number : **94304741.5**

Int. Cl.⁶ : **H04L 29/06**

Date of filing : **29.06.94**

Priority : **02.07.93 US 87164**

Date of publication of application :
04.01.95 Bulletin 95/01

Designated Contracting States :
**AT BE CH DE DK ES FR GB GR IE IT LI LU MC
NL PT SE**

Applicant : **Multi-Tech Systems Inc**
2205 Woodale Drive
Mounds View, Minnesota 55112 (US)

Inventor : **Johnson, Greg**
1505 Ferndale Avenue
Fridley, Minnesota 55432 (US)
Inventor : **Weinzierl, David A.**
7661 Greenfield Avenue N.E.
Apt 306, Mounds View, Minnesota 55112 (US)
Inventor : **Johnson, Richard D.**
1695 East County Road D, No 310
Maplewood, Minnesota 55109 (US)

Representative : **Belcher, Simon James et al**
Urquhart-Dykes & Lord
Tower House
Merrion Way
Leeds LS2 8PA (GB)

Modem with firmware upgrade feature.

Updated operating code and parameters can be reprogrammed into a modem system with no disassembly of the modem hardware. The modem system includes an in-circuit reprogrammable memory chip (3,17) in which operating code and parameters are stored. Two control programs control the reprogramming of updated operating code. One of the control programs is designed for manufacturing and testing purposes. The other control program allows remote reprogramming of updated operating code or parameters from a remote location such as a customer site. The modem system is portable, obtaining power from a standard 9 volt battery. Therefor, various power saving features are also incorporated into the modem system.

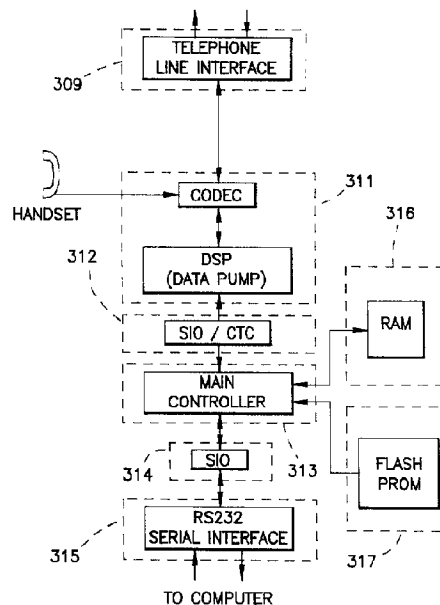


FIG. 2

EP 0 632 629 A1

Field of the Invention

The present invention relates to communications systems and in particular to a modem in which the firmware which controls the operation of the modem can be changed or upgraded remotely.

5

Background

Presently, there are several mechanisms through which software upgrades, bug fixes and the like are distributed to users. In systems employing firmware storage of operating programs, such as Electrically Programmable Read Only Memory (EPROM) and the like, bug fixes or enhancements to system firmware require programming a new EPROM with the updated code and shipping the new EPROM to the customer. A technician then travels to the site, disassembles the hardware, and replaces the old EPROM with the new one.

Unfortunately, these methods are very inconvenient. First, a considerable time delay is encountered while waiting for the manufacturer to program and ship the replacement parts. Second, the hardware may not be operable if the user is waiting for a bug fix. Especially true in cases of bug fixes where the hardware might not be operable without the updated operating code. Also, the replacement of the old with the new EPROM requires a technician to travel to the site and use special tools to disassemble the hardware and replace the outdated on faulty part or parts. This results in an increased expense for repairs or upgrades because technician time and special tools are required. Current update methods are thus time consuming, expensive and inefficient.

There is a need in the art, therefore, for a modem which allows remote changes and/or upgrades to be made to the firmware stored operating code, without requiring disassembly and replacement of parts, technician time, or special tools, thus resulting in the more efficient and cost effective means of updating firmware.

Summary

25

To overcome the shortcomings in the art described above, and to provide other advantages which will become apparent upon reading and understanding the present specification, the present system is a modem system which includes hardware and software components. The system allows the user to connect to remote locations equipped with a similar system or with modems or facsimile machines over a single analog telephone line. The incorporation of various power saving features allow practical implementation of a small, lightweight and easily transportable modem system powered from a standard 9 volt battery. The present modem system also incorporates storage of operating code and parameters in an in-circuit reprogrammable memory chip. A user can thus remotely upgrade system firmware with updates, bug fixes, enhancements or other new releases of system operating code by downloading the update over a phone line and reprogramming the memory chip in-circuit over the serial port.

35

Brief Description of the Drawings

In the drawings, where like numerals refer to like components throughout the several views,
 Figure 1 shows the telecommunications environment within which the present system may operate;
 Figure 2 is a block diagram of the hardware components of the present system;
 Figure 3 is a key for viewing the detailed electrical schematic diagrams of Figures 4A-7C to facilitate understanding of the interconnections between the drawings;
 Figures 4A-4E, 5A-5C and 6A-6C are detailed electrical schematic diagrams of the circuitry of the hardware components of the present system;
 Figure 7 shows a flow diagram of the process for downloading the HEX files containing the updated operating code from a bulletin board to the host PC;
 Figures 8A-8C show a flow diagram of the upgrade control program from the perspective of the host PC; and
 Figures 9A-9D show a flow diagram of the upgrade control program from the perspective of the modem.

45

Detailed Description of the Preferred Embodiments

In the following detailed description of the preferred embodiment, reference is made to the accompanying drawings which form a part hereof, and in which is shown by way of illustration specific embodiments in which the inventions may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the invention, and it is to be understood that other embodiments may be utilized and that structural changes may be made without departing from the spirit and scope of the present inventions. The

55

following detailed description is, therefore, not to be taken in a limiting sense, and the scope of the present inventions is defined by the appended claims.

Figure 1 shows a typical arrangement for the use of the present modem system. Hardware components 20 contain the present modem system and are connected to laptop computer 10. Hardware components 20 communicate over a standard telephone line 30 to one of a variety of remote sites. For example, one of the remote sites may be equipped with the present modem system including hardware components 20a and laptop computer 10a. The present modem system can also connect over phone lines 30 to fax machine 60, to a personal computer and associated modem 40, or to a network of personal computers 90. Those skilled in the art will readily recognize the wide variety of communication interconnections possible with the present system by reading and understanding the following detailed description.

Hardware Components

Figure 2 is a block diagram of the hardware components of the present system corresponding to reference number 20 of Figure 1. These components form the link between the user, the laptop or personal computer (PC) and the telephone line interface.

The preferred embodiment of the present system preferably includes a data pump circuit 211, which includes a digital telephone coder-decoder (CODEC) and a digital signal processor (DSP) for communicating over the telephone line interface 209. The data pump DSP of circuit 211 performs functions such as modulation, demodulation and echo cancellation to communicate over the telephone line interface 209 using a plurality of telecommunications standards including FAX and modem protocols. The main controller circuit 213 directly controls the DSP data pump circuit 211.

As described more fully below, the main controller circuit 213 includes, in the preferred embodiment, a microprocessor which controls the functions and operation of all of the hardware components shown in Figure 2. The main controller is connected to RAM circuit 216 and a programmable and electrically erasable read only memory or Flash PROM circuit 217. The Flash PROM circuit 217 includes non-volatile memory in which the executable control programs for the main controller circuits 213 are stored.

The RS232 serial interface 215 communicates to the serial port of the personal computer which is running the software components of the present system. The RS232 serial interface circuit 215 is connected to a serial input/output circuit 214 with main controller circuit 213.

Data is received from the telephone line over telephone line interface circuit 209 and forwarded by the data pump circuit 211 and the main controller circuit 213 over the serial line interface circuit 215 to the personal computer.

Detailed Electrical Schematic Diagrams

The detailed electrical schematic diagrams comprise Figures 4A-E, 5A-C, 6A-C and 7A-C. Figure 3 shows a key for how the schematic diagrams may be conveniently arranged to view the passing of signals on the electrical lines between the diagrams. The electrical connections between the electrical schematic diagrams are through the designators listed next to each wire. For example, on the right side of Figure 4A, address lines A0-A19 are attached to an address bus for which the individual electrical lines may appear on other pages as A0-A19 or may collectively be connected to other schematic diagrams through the designator "A" in the circle connected to the collective bus. In a like fashion, other electrical lines designated with symbols such as RNGL on the lower left-hand side of Figure 4A may connect to other schematic diagrams using the same signal designator RNGL.

Beginning with the electrical schematic diagram of Figures 4D and 4E, the DAA circuitry (telephone line interface) is shown. The telephone line connection in the preferred embodiment is through connector J201 which is a standard six-pin modular RJ-11 jack. In the schematic diagram of Figure 4E, only the tip and ring connections of the first telephone circuit of the RJ-11 modular connector are used. Ferrite beads FB201 and FB202 are placed on the tip and ring wires of the telephone line connections to reduce high frequency or RF noise that may radiate from telephone line. The incoming telephone line is also overvoltage protected through SIDACTOR R205. The incoming telephone line is full wave rectified by the full wave bridge comprised of diodes CR230, CR226, CR227 and CR228 of Figure 4D.

Also connected across the incoming telephone line is a ring detect circuit. Optical isolator U220 (part model number CNY17) senses the ring voltage threshold when it exceeds the breakdown voltages on zener diodes CR201 and CR202.

The DAA circuitry is physically isolated from the rest of the system by transformer T1, optocoupler U220 and two solid state relays X215 and X202 which are optically coupled. Connector J203 is a four pin header

used for automatic testing during manufacturing and for diagnostics.

Relay X215 shown in Figure 4D is used to accomplish pulse dialing by opening and shorting the tip and ring wires. Transistor Q203 along with the associated discrete resistors comprise a holding circuit to provide a current path or current loop on the telephone line to grab the line. The DAA circuitry shown in Figures 4D and 4E can be customized to interface to the varying telephone standards used in the United States and in many different European countries.

Connector J202 shown in Figure 4D connects the telephone line interface circuitry described above to connector J102 shown in Figure 6A and thusly to the rest of the circuit. Incoming RXA signals are buffered by the two operational amplifiers U104 as shown in Figure 6B. The first stage of buffering is used to drive the transmit carrier signal to the telephone line. The second stage of the input buffering is configured for a moderate amount of gain before driving the signal into CODEC U101. This stage is also used to reduce the amount of transmit signal that is fed back into the receiver. The signal from amplifiers U104 is also fed to speaker driver U105, which drives speaker X101.

Data and address buses A and B shown in Figures 4A and 4B connect the Z80180 microprocessor in microcontroller U5 with the Z80 KIO circuit U4 and a gate array circuit U3, and to other portions of the electrical schematic diagrams. Gate array U3, also shown in Figures 4A and 4B, includes the "glue logic" used to support various functions in the hardware components of the present invention. Gate array U3 includes miscellaneous latch and buffer circuits for the present system which normally would be found in discrete SSI or MSI integrated circuits. By combining a wide variety of miscellaneous support circuits into a single gate array, a much reduced design complexity and manufacturing cost is achieved.

CODEC chip U101 shown in Figure 6B, interface chip U1 shown in Figure 5A and digital signal processor (DSP) chip U2 shown in Figure 5A comprise a data pump chip set manufactured and sold by AT&T Microelectronics. A detailed description of the operation of these three chips in direct connection and cooperation with one another is described in the publication entitled "AT&T V.32bis/V.32/FAX High-Speed Data Pump Chip Set Data Book" published by AT&T Microelectronics, December 1991, which is incorporated herein by reference. This AT&T data pump chip set comprises the core of an integrated, two-wire full duplex modem which is capable of operation over standard telephone lines or leased lines. The data pump chip set conforms to the telecommunications specifications in CCITT recommendations V.32bis, V.32, V.22bis, V.22, V.23, V.21 and is compatible with the Bell 212A and 103 modems. Speeds of 14,400, 9600, 4800, 2400, 1200, 12,000 and 300 bits per second are supported. This data pump chip set consists of a ROM-coded DSP16A digital signal processor U2, and interface chip U1 and an AT&T T7525 linear CODEC U101. The AT&T data pump chip set is available from AT&T Microelectronics.

The chip set U1, U101 and U2 on Figures 5A and 6B perform all A/D, D/A, modulation, demodulation and echo cancellation of all signals placed on or taken from the telephone line, and performs DTMF tone generation and detection, signal analysis of call progress tones, etc. The transmission of information on the telephone line from CODEC U101 is through buffers U104, and through line buffer U105 as described above.

The main controller of controller circuit 213 and the support circuits 212, 214, 215, 216 and 217 are shown in Figures 4A-4C and 5A. In the preferred embodiment of the present system, the main controller U5 shown in Figures 4A and 4B is a Z80180 eight-bit microcontroller chip. In the preferred implementation, microcontroller chip U5 is a Z80180 microprocessor, by Zilog, Inc. of Campbell, California. The Zilog Z80180 eight-bit microprocessor operates at a 12.288 MHz internal clock speed by means of an external crystal XTAL, which in the preferred embodiment, is a 24.576 MHz crystal. The crystal circuit includes capacitors C1 and C2 which are 20 pf capacitors and resistor R15 which is a 33 ohm resistor. The crystal and support circuitry is connected according to manufacturer's specifications found in the Zilog Intelligent Peripheral Controllers Data Book published by Zilog, Inc. The product description for the Z80180 Z180 MPU from the Z80 CPU Product Specification pages 351-392 of the Zilog 1991 Intelligent Peripheral Controllers databook is incorporated herein by reference.

The Z80180 microprocessor in microcontroller chip U5 is intimately connected to a serial/parallel I/O counter timer chip U4 which is, in the preferred embodiment, a Zilog 84C90 CMOS Z80 KIO serial/parallel/counter/timer integrated circuit available from Zilog, Inc. This multi-function I/O chip U4 combines the functions of a parallel input/output port, a serial input/output port, bus control circuitry, and a clock timer circuit in one chip. The Zilog 84C90 product specification describes the detailed internal operations of this circuit in the Zilog Intelligent Peripheral Controllers 1991 Handbook available from Zilog, Inc. Z84C90 CMOS Z80KIO Product specification pgs. 205-224 of the Zilog 1991 Intelligent Peripheral Controllers databook is incorporated herein by reference.

The memory chips which operate in conjunction with the Z180 microprocessor in microcontroller chip U5 are shown in Figure 4C. The connections A, B correspond to the connections to the address and data buses, respectively, found on Figure 4A. Memory chip U7 is a read-only memory (ROM) chip which is electrically re-

programmable in circuit. This programmable ROM, typically referred to as a flash PROM, holds the operating code and operating parameters for the present system in a non-volatile memory. Upon power-up, microcontroller chip U5 executes the program code that is stored in the flash PROM U7. In the preferred embodiment, RAM chip U6 is a pseudostatic RAM which is a dynamic RAM with a built-in refresh. Those skilled in the art will readily recognize that a wide variety of memory chips may be used and substituted for pseudo-static RAM U6 and flash PROM U7 without departing from the scope of the present invention.

The interface between the main controller circuit 213 and the personal computer is through SIO circuit 214 and RS232 serial interface 215. RS232 connection J103 is shown on Figure 6A with the associated RS232 driver circuit U102 and interface and ring detect circuitry used to generate and receive the appropriate RS232 standard signals for a serial communications interface with a personal computer.

Figure 6C is a detailed electrical schematic diagram showing the generation of various voltages for powering the hardware components of the electrical schematic diagrams described herein. The power for the present hardware components described herein is received from either a standard 9 volt battery or through AC adaptor J104 which is a standard 3 Pin Power Jack. When the AC adaptor is plugged in, the battery is disconnected. Power is controlled by power switch S101. The preferred modem system is designed to run off of a standard 9 Volt battery, thus resulting in a small, lightweight and easily transportable package. However, it shall be understood that the modem could also be run from any other power source using standard interfaces and conversion circuitry known well in the art. 5 volt regulator U107 is a linear regulator with a low drop out voltage of about 5.3. Q102 is a MOSFET which controls on/off as directed by power switch S101. Power switch S101 turns on MOSFET Q102, and has three positions, on, off, or auto. In auto position, power switch S101 senses the Data Terminal Ready Signal from the computer, and if that is not present, then the power to the modem is turned off completely. Thus, if no communications software is loaded, the modem is automatically off such that no power is wasted. From the circuitry of Figure 6C, the +9 volts DC is regulated down to 5 volts, and is also inverted via U106 to get a negative voltage. The negative voltage is used to drive the RS232 driver U102 shown in Figure 6A. As a result, five volts are derived for operating the various memory, logic and controller chips and support circuitry of the present system.

Figure 5B shows connector J1 which interfaces with connector J101 shown in Figure 6A. Figure 5C shows the interconnection of the status LED's found on the front display of the modem of the present invention.

30 Power Saving Features

Referring again to Figure 5A, the interface chip U1, discussed in detail above is shown. Also shown in the upper left portion of Figure 5A is power saving circuitry which is incorporated into the present modem system to enable the practical implementation of a small, lightweight and easily portable modem suitable for use with a laptop computer, for example. The power saving features of the present modem system allow the design to be powered from a standard 9 volt battery as discussed above with respect to Figure 6C.

In order to conserve power, various power saving features are provided which allow the present modem system to be put in a low power, or "sleep" mode. In sleep mode the power to the modem is greatly reduced. There are three main power saving features in the sleep mode. First, additional circuitry has been added in the preferred embodiment to allow additional power savings to be realized. Second, the AT&T data pump chip set has a built in low power mode. Third, the Z180 MPU U5 also has a built in low power mode.

The AT&T data pump chip set U1, U2 and U101 described in detail above has the ability to be put into a low power mode. When in low power mode, the CODEC bit clock TCODEC generated by interface chip U1 shown on Figure 5A is slowed to 115kHz to provide a required clock signal to DSP chip U2 and CODEC U101. The data pump chip set enters sleep mode automatically after a reset, a disconnect or by user command. The chip set automatically wakes up when a ring signal or host command is received. The built-in sleep mode of the AT&T data pump chip set is described in more detail in the aforementioned publication entitled "AT&T V.32 bits/V.32/FAX High-Speed Data Pump Chip Set Data Book" published by AT&T Microelectronics, December 1991.

In addition to the power saving sleep mode provided by the AT&T data pump chip set U1, U2 and U101, the present invention provides additional power saving features. These features include providing an external clock oscillator XTL1. Circuitry is provided such that external clock oscillator XTL1 can also be put in sleep mode (disabled). This results in a significant power savings as the oscillator would consume power unnecessarily when the modem is not in use. When XTL1 is disabled, the clock to CODEC U101 is switched to a low frequency, approximately 100 kHz signal generated from K10 U4 of Figure 4A via NAND gate U10 of Figure 5B.

Crystal XTL2 is a 20.275 MHZ crystal which is used in conjunction with an internal oscillator provided on interface chip U1. The internal oscillator is described in the above listed documentation for interface chip U1.

The present modem system can be assembled with either the crystal XTL2/C17/C18 combination or the external clock oscillator XTL1/C19 combination. With either combination, the power saving feature built into the AT&T data pump chip set U1, U2 and U101 can be used. However, with the XTL1/C19 combination the AT&T data pump chip set power saving feature and also the additional feature of disabling external oscillator XTAL1 can be used for even greater power savings. External clock oscillator XTL1 is part number CO2810 available from Raltron Corporation of Miami, Florida. External clock oscillator XTL1 has a frequency of 40.5504 MHz and is described in more detail in the publication entitled "CLOCK OSC, Model CO2810 Series (SMD Type OSC)", published by Raltron Corporation, which is incorporated herein by reference. In the preferred embodiment, external clock oscillator XTL1 is used as the main clock for the AT&T data pump chip set U1, U2 and U101 and runs at 40.5504 MHz to drive the interface chip U1.

When the present modem system is off-hook and the Z180 MPU U5 is not processing, the Z180 MPU U5 can be put into a low power or SLEEP mode. The Z180 MPU SLEEP mode places the CPU into a state in which the internal CPU clock stops, thereby consuming less current. The Z180 MPU U5 wakes up when one of the interrupts INT0, INT1 or INT2 shown in Figures 4A and 4B is asserted.

INT0 wakes up the Z180 MPU U5 in response to interrupts generated by K10 U4. INT1 wakes up the Z180 MPU U5 in response to a RNGL or watchdog timer (WDOUT-) signal. The watchdog is a slow timer (in the seconds) which allows the processor to keep track of time. For example, the processor must keep track of the time for which the modem cannot call a blacklist of forbidden phone numbers. INT2 wakes up the Z180 MPU U5 in response to a DTE data signal (TD shown in Figure 5B).

The built in SLEEP mode of the Zilog Z180 MPU U5 is described in more detail in the aforementioned publication Zilog Intelligent Peripheral Controllers 1991 Handbook.

Functional Description of Upgrade Control Programs

The preferred modem system includes two control programs which control the remote in-circuit reprogramming of system firmware, a flash control program and a boot control program. The flash control program runs in the host PC and receives updated operating code downloaded from a bulletin board. The updated code is downloaded to the host PC in the form of Intel HEX files. The flash control program processes the HEX files and creates the packets containing the updated code which are actually sent to the modem. Each packet contains a field containing the packet length, the address at which to store the updated code, the actual program data and a checksum. The boot control program running in the modem checks that the packet was correctly transmitted and programs the updated operating code at the address specified in the address field of the packet.

In summary, the flash control programs control the host PC side of the process of in-circuit reprogramming of flash PROM U7. The boot control program controls the modem side. As described above, flash PROM U7 is an in-circuit programmable and electrically erasable read only memory. As is well known to those of skill in the art, these memory chips allow in-circuit reprogramming of the operating code and parameters which are stored in the flash PROM chip U7. Although the present modem system is described with respect to a particular flash PROM U7, it shall be understood that any in-circuit reprogrammable memory configuration could be used without departing from the scope of the present invention.

Before flash PROM U7 is assembled in the modem circuit, the boot control program is burned, or programmed into flash PROM U7 using conventional PROM programmers and programming techniques.

When a bug fix, enhancement or other new release of system operating code becomes available, the flash control program is used to control the remote loading and processing of operating code downloaded over telephone line from a central bulletin board. The boot control program receives the updated code from the host PC over the serial port and controls in-circuit reprogramming of the new operating code into flash PROM U7.

The field programmable feature of the modem system of the present invention has several advantages. Because a user can remotely load new operating code over a remote telephone connection, code updates can be obtained immediately as soon as they are available instead of waiting for new parts to be shipped. In addition, no physical removal or replacement of parts is required thus significantly reducing the chance of breakages. Further, no special tools are required to remove and replace parts, and no special PROM programming equipment is required to reprogram the memory chips. Finally, the need for a technician to travel to the remote site to perform the upgrade is avoided thus significantly reducing costs associated with the upgrade.

Detailed descriptions of the flash control program and boot control program will now be given. The illustrative embodiments of the flash control program and boot control program described and shown herein is with special reference to a PC-based DOS operating system. It shall be understood, however, that the present invention is in no way limited to a DOS operating system. The preferred modem system can also be used with a UNIX-based operating system, MacIntosh operating system, or any of a number of operating system plat-

forms simply by customizing the user interface to run on the desired operating system.

Detailed Description of Flash Control Program

5 The flash control program is used to control the reprogramming of updated operating code and parameters into the flash part of the modem.

The updated operating code is distributed to the user according to the procedure shown in Figure 7. To get the update, HEX files containing the updated operating code are downloaded over a phone line from a computer bulletin board to the host PC. The HEX files are preferably in the Intel MCS-86 HEX format. This is an industry standard for HEX files.

10 The HEX files contain entirely ASCII characters and include three record types: Data Record, End Record and Extended Address Record. The formats of the three record types are described in detailed at page 27 of the User Manual for the Gtek EPROM programmer model 9000, dated 01-11-88, which is incorporated herein by reference, and are as follows:

Data Record

Byte number	Contents
1	Colon(:)
2-3	Number of binary data bytes
4-5	Load address, high byte
6-7	Load address, low byte
8-9	Record type, must be "00"
10-x	Data bytes, 2 ASCII-HEX characters
x+1 - x+2	Checksum, two ASCII-HEX characters
x+3 - x+4	carriage return (CR), line feed (LF)

End Record

Byte number	Contents
1	Colon(:)
2-3	Record length, must be "00"
4-7	Execution address
8-9	Record type, must be "01"
10-11	Checksum
12-13	CR,LF

Extended Address Record

Byte number	Contents
1	Colon(:)
2-3	Record length, should be "02"
4-7	Load address field, should be "0000"
8-9	Record type, must be "02"
10-13	USBA-this number multiplied by 16 is the new load offset address For our use only the first digit is used as the 64K bank offset value
14-15	Checksum
16-17	CR,LF

Figures 8A shows a detailed flow diagram of the flash control program 800. The beginning of the flash control program 800 is shown. First, the internal environment and variables are initialized. The preferred flash control program 800 accepts either command line parameters or can be run in a menu driven mode. The present state of the user interface screen is saved and cleared while the field upgrade control program is running. The screen is saved for later restoration after the reprogramming is completed.

Flash control program 800 continues at control block 802, which starts the help system. The help system reports onscreen status messages to the user during various stages of reprogramming. At times information may be requested from the user. Also, error messages and possible courses of action are displayed when appropriate.

Next, flash control program 800 reads the setup file to determine which serial port the modem is connected through, the appropriate baud rate and other necessary setup information. The serial port is then initialized according to the setup information obtained.

Control block 804 allocates a 128 kbyte memory buffer in the host PC. This memory buffer is used to store processed HEX files containing the updated operating code to be programmed into the flash PROM in the modem. Processing of the HEX files is described in detail below with respect to Figure 8B.

If "AUTOMATIC MODE" is set at query 806, flash control program 800 automatically runs the user through the reprogramming procedure. However for certain manufacturing and R&D purposes, it is desirable for the user to have more control over the reprogramming procedure. Thus, automatic mode can be disabled. When automatic mode is disabled, the flash control program checks whether the name of the HEX file to be programmed is present on the command line. If not, a user "PROCESS MENU" will appear on the screen at control block 807 with the choices "PORT SETUP," "READ FILE," "PROGRAM," or "EXIT." The user can then select the functions to be performed. If the HEX file name was on the command line, the flash control program continues with READ AND PROCESS FILE routine 810 described in detail below.

Otherwise, in AUTOMATIC MODE, flash control program 800 continues at the top right portion of Figure 8A with control block 808. Here all HEX files present in the host PC are found and their names displayed onscreen. The user chooses the name of the file to be programmed into the modem. If the desired file is not listed, the user can press the ESC key to exit the program.

Although the bytes of each record in the HEX files downloaded from the bulletin board are sequential, the HEX records themselves are in no particular order within the file. The file must therefore be processed and sorted into a format which can be programmed into the modem. READ AND PROCESS FILE routine 810 reads the standard Intel HEX files stored in the host PC and performs the necessary HEX file processing.

Figure 8B shows a detailed flow diagram of the READ AND PROCESS FILE routine 810. The purpose of READ AND PROCESS FILE routine 810 is to convert the ASCII HEX characters contained in the HEX records to a binary format appropriate for programming into flash PROM U7. Routine 810 begins with an update of the onscreen help display. Next, the memory buffer is "zapped", i.e., set to all FF hex (all 1 binary). This corresponds to the erased state of flash PROM U7.

Next the HEX file is opened for read access and the first HEX record is read. The record is then parsed to check syntax and to determine the record type indicated by the record type field of each HEX record as described above.

If the record is type 0 the record is a data record. The record is processed as a data to be loaded in the

memory buffer at the current memory pointer, where the pointer is the current 64k page plus the address supplied in the record. After the data is converted from a ASCII text to binary and stored to the memory buffer, the pointer is incremented to the next available space in the buffer.

Record type 02 indicates an extended address record. The information in these records is converted from ASCII text to binary and processed as a 64k page number to be added as an offset to all of the following records until a new record type 02 is reached.

Record type 01 indicates an End of File (EOF) record. If address 0000, 0001 or 0002 were programmed, these addresses are forced to 0c3h, 00 and 01, respectively. This is the code for a jump to boot control area, rather than the normal modem code. This step ensures that the boot control area of the flash part is not corrupted.

READ AND PROCESS FILE routine 810 reads through the records in the HEX file until all records have been read, processed and stored into the memory buffer in the host PC. After the last record has been processed, the READ AND PROCESS FILE routine 810 is completed.

Referring again to Figure 8A, after READ AND PROCESS FILE routine 810 is completed, flash control program 800 queries the user ensure that the correct file to be programmed into the modem has been identified. If not, the program exits. Otherwise, flash control program 800 continues with PROGRAM FILE INTO PRODUCT routine 820.

Figure 8C shows a detailed flow diagram of PROGRAM FILE INTO PRODUCT routine 820. The present modem system uses the well-known and widely used AT command set. As is well-known in the art, the AT command set allows a user to control a modem by entering commands through a computer keyboard. The AT command set can be used to direct the modem to perform functions such as accessing a telephone line, taking the receiver off-hook, dialing and hanging up. The AT command set can also be used for more intelligent functions such as downloading or uploading files. Many of these more intelligent functions of the AT command set are used in the present modem system, as described in more detail below. The AT command set is used in the PROGRAM FILE INTO PRODUCT ROUTINE 820.

A general overview of the PROGRAM FILE INTO PRODUCT routine 820 will now be described with reference to Table 1 and Table 2. The handshaking procedure which negotiates the transfer baud rate between the host PC and modem, which was discussed above is shown in Table 1. The AT command set shown and described in Table 2 is used to control the modem. All data sent is 8 bits, no parity and 1 stop bit.

Table 1

Host	Modem
5	Power up or AT*FS triggers execution of the boot code.
10	Responds with `U` at 19200 baud if `M`s received within 30 ms of power up or AT*FS command. Otherwise jumps to main code on time out.
15	If `D` received within 300 ms of when `U` sent, then modem responds with `J`: can receive at 19200 baud `K`: can receive at 19.2k or 38.4k baud `M`: can receive at 9.6k, 19.2k, 38.4k, 57.6k or 115.2k baud. Otherwise jumps to main code on time out.
20	
25	
30	
If `J` then 19200 baud Otherwise may send `I`: 9600 baud `J`: 19200 baud `K`: 38.4k baud `L`: 57.6k baud `M`: 115.2k baud	
35	Configure for negotiated speed.

40 Referring now to Figure 8C, the serial port is initialized to 19200 baud, and is set for packets of 8 bits, no parity and 1 stop bit. AT*FS is a special command which tells the modem to jump to address zero, which is equivalent to powering on the modem. At that point, the host PC and modem engage in a handshaking procedure to negotiate the transfer baud rate, shown in tabular form in Table 1 above. Pursuant to this handshaking procedure, the host PC starts sending capital 'M's to the modem at an initial baud rate of 19200. The host PC sends 'M's until it receives a 'U' response from the modem. Timeout is controlled by the modem side as described below with respect to Figure 9A. The host PC continues to send 'M' at 19200 baud until a 'U' is received.

45 In the normal case, the modem will respond with a 'U' within 30 milliseconds. At that point, the PC will send back a 'D' and the modem responds within 300 ms with either 'J', 'K' or 'M', depending on the modem version and the corresponding baud rate at which it can run. If the modem responds with a 'J', the computer assumes a baud rate of 19200.

50 If the modem responds with a 'K', the computer can choose 38400 or 19200 baud. A response of 'M' means that the modem can be run at 9600, 19200, 38400, 57600 or 115.2k baud. The PC sends I, J, K or M to set the speed. The host PC and modem then each initialize the negotiated baud rate and configure accordingly.

The modem is now prepared to receive the AT command set as shown in Table 2:

55

Table 2

Command	Description
ATIx, where x=0, 1, 2, or 3	special codes
ATFLEND	exit program and jump to main code
ATFLP	program a packet

5

10

Next, the host PC sends an AT11 command. The AT11 command contains the boot control program version number. The version number determines the packet size, which can range from 128 bytes to 4k byte packet size depending on the version number received. The host PC then sets the max packet size according to the version number received.

15

Next, as shown in control box 880 in the top right of Figure 8C, the host PC initializes pointers to the top of the RAM buffer which was allocated in control box 804 shown on Figure 8A, and in which the processed and sorted updated operating code to be programmed into the flash PROM in the modem is stored.

20

Once the pointers are initialized to the top of the RAM buffer in the host PC, control block 882 commands the PC to check a software protect switch which when enabled prevents overwriting of the program area of the flash PROM in which the boot control program is stored, or which when disabled allows portions of the boot control program to be updated. For normal use the software protect switch is enabled to prevent erroneous overwriting of the boot control program area. However, for R&D or manufacturing purposes it may be necessary to update or reprogram the boot control area. The software protect switch thus provides a software "back door" which allows access to the area of the flash PROM where the boot control program is stored.

25

Referring again to Figure 8C, the host PC begins to build a packet which will be sent to the modem over the serial port. In the control blocks 884 and 886 the host PC builds a packet by searching through the HEX files in the RAM buffer, searching for contiguous non-blank pages. A HEX file blank page is defined as a page programmed to all FF. Whenever a non-blank page is found the packet length is incremented. Variable length packets may be sent in sizes up to the specified max packet length determined by version number as described above. Once a blank page is found or the max packet length is reached, the packet is complete and ready to be transferred to the modem over the RS232 serial port.

30

35

The packet built by the process shown in control blocks 884 and 886 includes a header portion and a data portion. The header portion includes a length field created by the host PC as it builds of the packet. The header portion also includes an address field which contains the physical starting address of where the data is to be placed in the flash PROM. The data portion includes the updated program data bytes and an XOR'd checksum. The packet format is shown in Table 3:

Table 3

Packet Field	Field Length
Length High	1 byte
Length Low	1 byte
Address High	1 byte (only lowest order 4 bits used, upper 4 bits set to 0)
Address Middle	1 byte
Address Low	1 byte
Program Data	x bytes
XOR'd checksum	1 byte

40

45

50

After the packet is built, the host PC sends the command ATFLP to the modem, the command for program a packet. Upon receipt of the ATFLP command, the modem responds with a 'G'. The host PC then transmits the data packet pointed to by the RAM buffer pointer.

55

After the packet is received by the modem, the modem generates its own checksum based on the data received and compares it to the checksum sent by the host PC. If they are equivalent, the modem responds with 'OK', and the received code is programmed into the flash PROM address pointed to by the Address High,

Middle, and Low bytes. Otherwise the modem responds with an error.

The host PC will run through the programming loop, searching through the RAM buffer, creating packets and sending packets to the modem until the programming is complete or until 5 consecutive errors occur.

After the host PC has sent all the packets, as determined by the DONE PROGRAMMING query, the host PC sends an ATFLEND command to signal that programming is completed. After the file has been programmed, an exit routine, shown in Figure 8A is run in which timers are shut down and the state of the screen is restored. The user is informed that the program is completed or was terminated due to error. The program then jumps to the normal modem code.

10 **Detailed Description of the Boot Control Program**

Figures 9A and 9B show a flow diagram of the boot control program. Figures 9A and 9B show the same programming procedure as described above with respect to Figures 8A-8C, except that Figures 8A-8C were described from the perspective of the host PC and Figure 9A and 9B are described from the perspective of the modem. The program begins with power up or AT*FS. The serial port between modem and host PC is initialized for 19200 baud. At this point the modem also copies the program code into RAM. The boot control program is run out of RAM while the flash PROM is reprogrammed. This is because certain bits in flash PROM U7 are toggled during reprogramming and therefore the boot control program must be copied to RAM to avoid corruption of the boot control code.

Next, the handshaking protocol described above with respect to Figure 8C is performed. The modem initializes a counter for 30 milliseconds. If the modem receives an 'M' from the host PC, the modem responds with a 'U'. If no 'M' is received, the counter is decremented. The loop will timeout after 30ms if no 'M' is received. The number of times through the loop is dependent on the crystal speed of the modem, but is equivalent to 30 milliseconds.

When the 'M' is received and the 'U' response is sent, another counter is initialized to 300 milliseconds. If a 'D' is received from the host PC within the 300ms timeout, the modem responds with a 'K' or an 'M', depending on the baud rate at which the modem can run.

The host PC then sends either 'I', 'J', 'K', 'L' or M, and both the host PC and the modem configure their baud rates according to the negotiated speed.

The AT commands ATFLP, ATFLEND or ATIx can now be received by the modem. Flow diagrams showing the programming procedures on receipt of these commands are shown in Figures 9B-9D.

Figure 9B shows the control flow upon receipt of the ATFLP command. The modem first responds with a 'G' to indicate that the ATFLP command was received. Next, the packet length bytes and programming address bytes are received from the host PC. A counter is initialized to the length of a packet, and the checksum is initialized to 0.

The modem next runs through a loop, getting each data byte and calculating a new checksum by XOR'ing the checksum from the previous iteration through the loop with the data received. The modem continues through the loop, decrementing the counter each iteration until the count equals 0, indicating that the entire packet was received.

Next, the modem receives the checksum data byte which was generated by the host PC. If the checksum data byte generated by the host PC is equal to the checksum generated by the modem, the data bytes are programmed into the programming address sent with the packet into the flash PROM and an 'OK' response is sent to the host PC. If the checksums are not equal, an error message is sent to the host PC.

Figure 9C shows the flow diagram for the ATFLEND command. As discussed above, the ATFLEND command occurs when programming of the flash PROM is completed. If the command ATFLEND is received, the serial port is disabled and a jump to the normal modem code is performed.

Figure 9D shows other commands ATIx, where x=0, 1, 2 or 3. ATi0 commands the modem to respond with a product identification code. ATi1 commands the modem to respond with a boot version number, which is the version of the boot control program installed in the modem. The boot version number is important because different versions may require different packet lengths.

ATi2 is for identification of a basic modem or hardware platform. MT1432xx indicates a derivative of the basic MT1432 platform, for example. These could become more specific to facilitate a more intelligent host interface. ATi3 can be used to indicate country types, special defaults, or for future expansion of making a smarter PC host interface.

55

Claims

1. A reprogrammable modem system, comprising:
 - a communications module, the module comprising:
 - communications interface means connected for communicating with a first device for transferring data between the first device and the communications module;
 - telephone line interface means for connection to a telephone line;
 - control means for executing operating code to control said communications module;
 - memory means for storing the operating code; and
 - programming means for programming said operating code into said memory means;
 - the control means executing software to communicate with the second device through the telephone line and operable for initiating a telephone call to a second device in response to the commands by a local user of the first device and for controlling downloading of the updated operating code from the second device to the first device;
 - the control means further executing software to communicate with the first device through the communications interface and to control transfer of said updated operating code from the first device to the communications module over the communications interface.
2. The system of claim 1 wherein the memory means comprises an Electrically Erasable Programmable Read Only Memory.
3. The system of claim 1 further including:
 - power saving means in the communications module for conserving power when the communications module is not in use, the power saving means comprising:
 - external oscillator means for providing an external clock signal to the communications module during use of the communications module;
 - low frequency oscillator means for providing a low power, low frequency clock signal to the communications module when the communications module is not in use;
 - the first control means further for operating in a low power mode when the communications module is not in use;
 - the communications module further for operating in a low power mode when the communications module is not in use.
4. The system according to claim 1 wherein the control means is further operable for programming the updated operating code into the communications module by performing the steps of:
 - (a) reading a first portion of the updated operating code transferred from the first device;
 - (b) processing the read portion from a first format to a second, binary format;
 - (c) storing the processed updated operating code in a memory buffer;
 - (d) reading a next portion of the updated operating code transferred from the first device; and
 - (e) repeating steps (b)-(d) until all of the updated operating code is stored in the memory buffer.
5. The system according to claim 1 wherein the control means is further operable for programming the updated operating code into the communications module by performing the steps of:
 - (a) negotiating a baud rate between the first device and the communications module;
 - (b) creating a packet having a packet identifier, a length indicator, a programming address and a variable amount of the processed updated operating code;
 - (c) transmitting the packet to the communications module;
 - (d) programming the processed updated operating code in the packet into the memory means at the programming address; and
 - (e) repeating steps (b) - (d) until all processed updated operating code is programmed into the memory means.
6. The system according to claim 1 further including:
 - an external oscillator adapted to output an external clock signal;
 - the communication module further including a data pump circuit, the data pump circuit requiring a clock signal when not in use;
 - low frequency oscillator adapted to output a low frequency clock signal and adapted to operate using low power; and

sleep means for disabling the external oscillator when the communications module is not in use, and further for enabling the low frequency oscillator to provide the required clock signal to the data pump means.

- 5 7. The system of claim 1 wherein the first device comprises a central computer.
8. The system of claim 1 wherein the second device comprises a personal computer.
9. The system of claim 1 wherein the communications interface comprises a serial port.
- 10 10. In a communications module which handles communication between a first device connected to the communications module over a telephone line, and a second device connected to the communications module over a communications interface, the communications module under control of operating code to which periodic updates are made, a system for in-circuit reprogramming of the operating code, comprising:
- 15 storage means in the communications module for storing the operating code, and for receiving and storing updated operating code;
- receive means in the second device for receiving the updated operating code from the first device over the telephone line;
- control means for programming the updated operating code into the storage means, said control means including:
- 20 protocol means for transferring the updated operating code from the second device to the communications module over the communications interface according to a predetermined communications protocol; and
- check means for verifying that the updated operating code was accurately transferred.
- 25 11. A method of upgrading the operating code which controls a modem system, comprising the step of:
- (a) storing in a first device updated operating code;
- (b) transferring the updated operating code in a first format from the first device to a second device;
- (c) storing the updated operating code in a first memory buffer;
- 30 (d) reading a first portion of the updated operating code;
- (e) creating a packet having a packet identifier, a length indicator, a programming address and the read portion of the updated operating code;
- (f) transmitting the packet to the modem system;
- (g) programming the portion of the updated operating code into the modem system at the address specified in the programming address;
- 35 (h) reading a next portion of the updated operating code;
- (i) repeating steps (e) - (h) until all of the updated operating code is programmed into the modem system.
- 40 12. A reprogrammable modem system, comprising:
- a communications module, the module comprising:
- communications interface means connected for communicating with a first device for transferring data between the first device and the communications module;
- telephone line interface means for connection to a telephone line;
- control means for executing operating code to control said communications module;
- 45 memory means for storing the operating code; and
- programming means for programming said operating code into said memory means;
- the control means executing software to communicate with the second device through the telephone line and operable for initiating a telephone call to a second device in response to the commands by a local user of the first device and for controlling downloading of the updated operating code from the second device to the first device;
- 50 the control means further executing software to communicate with the first device through the communications interface and to control transfer of said updated operating code from the first device to the communications module over the communications interface;
- an external oscillator adapted to output an external clock signal;
- 55 the communication module further including a data pump circuit, the data pump circuit requiring a clock signal when not in use;
- low frequency oscillator adapted to output a low frequency clock signal and adapted to operate using low power; and

EP 0 632 629 A1

sleep means for disabling the external oscillator when the communications module is not in use, and further for enabling the low frequency oscillator to provide the required clock signal to the data pump means.

5

10

15

20

25

30

35

40

45

50

55

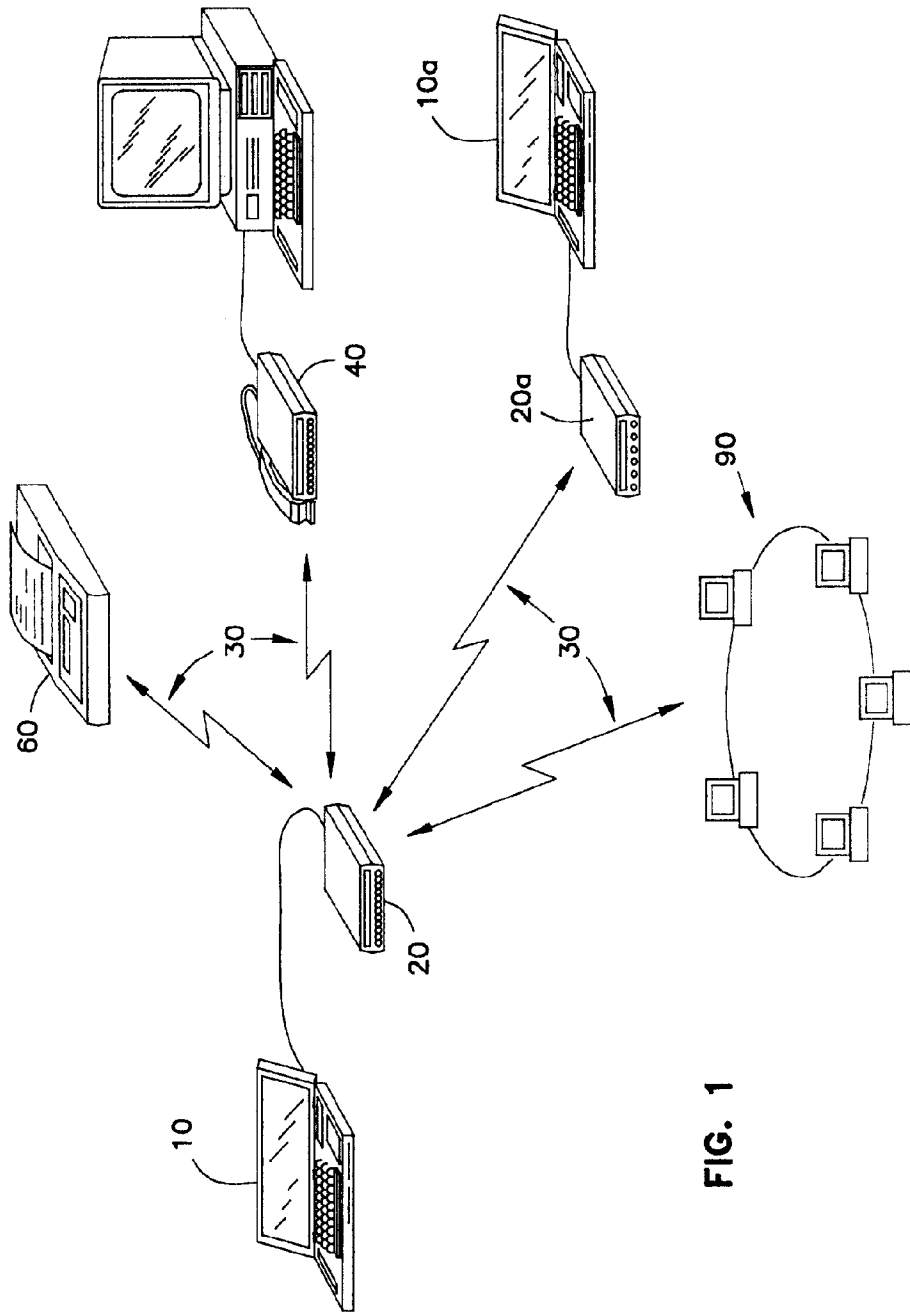


FIG. 1

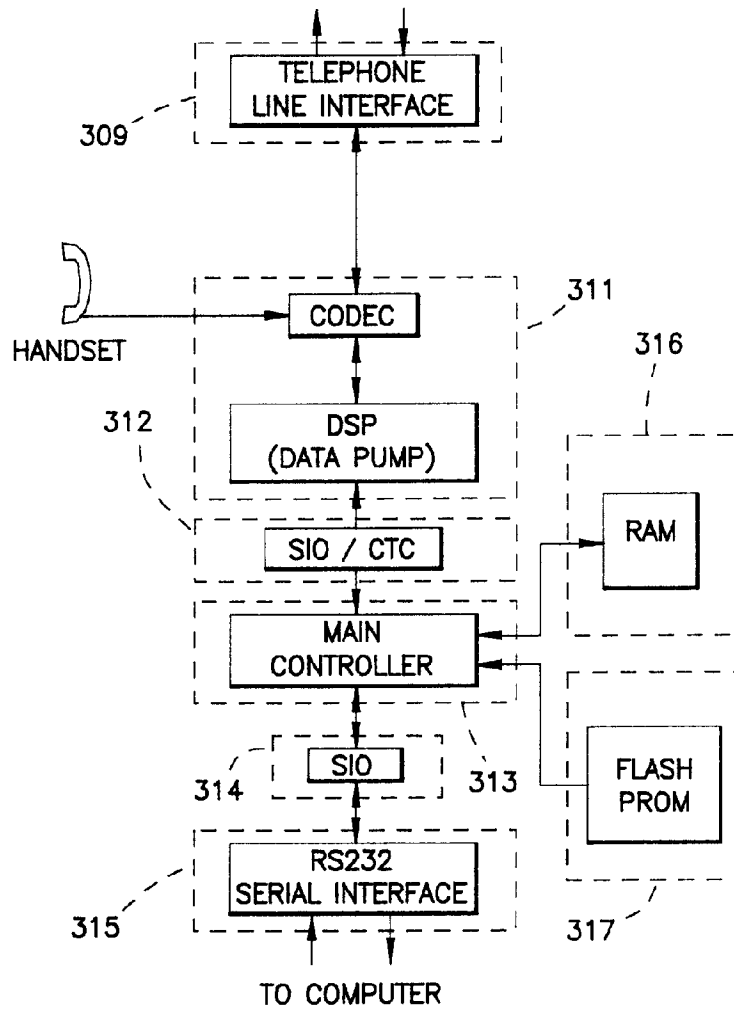


FIG. 2

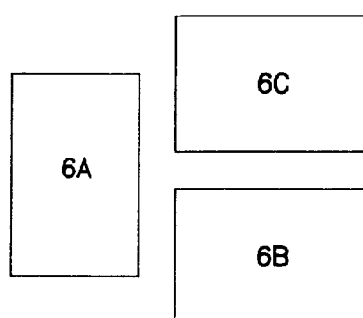
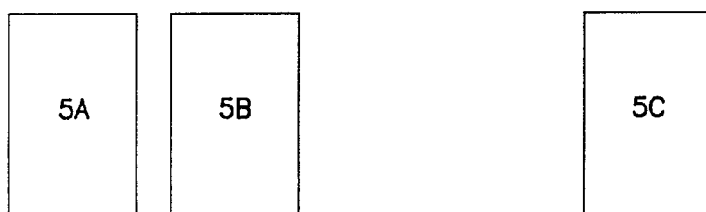
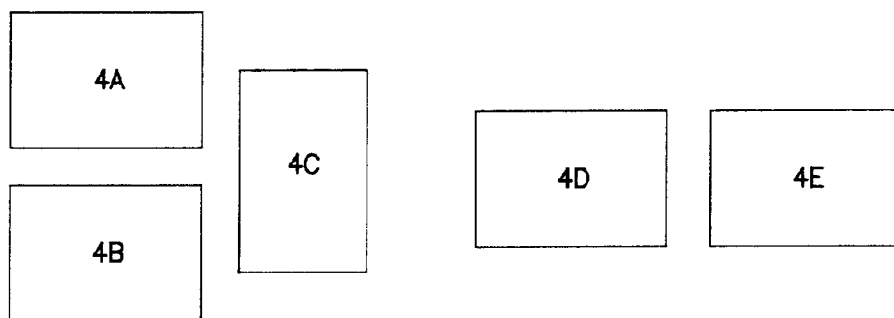


FIG. 3

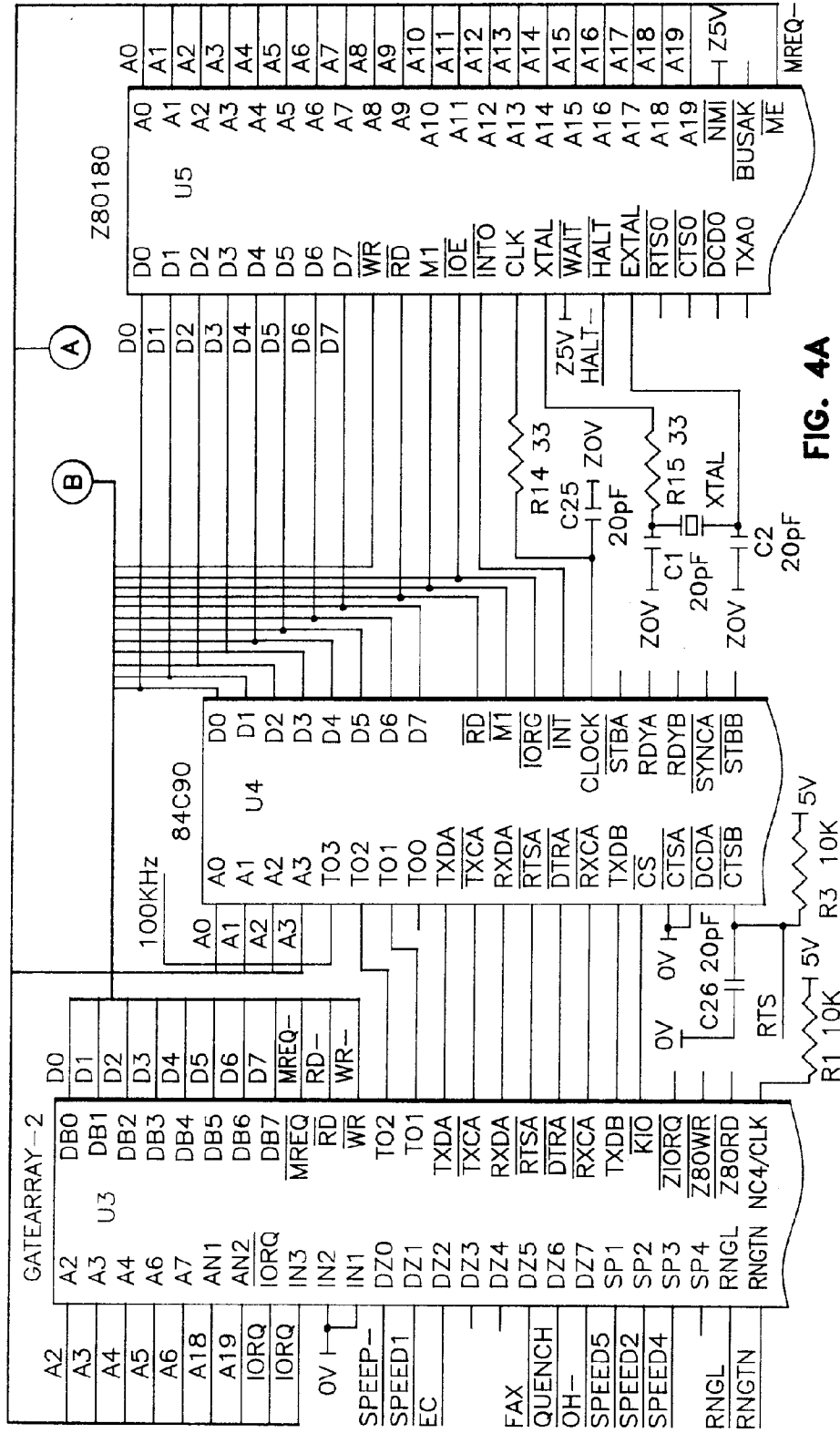


FIG. 4A

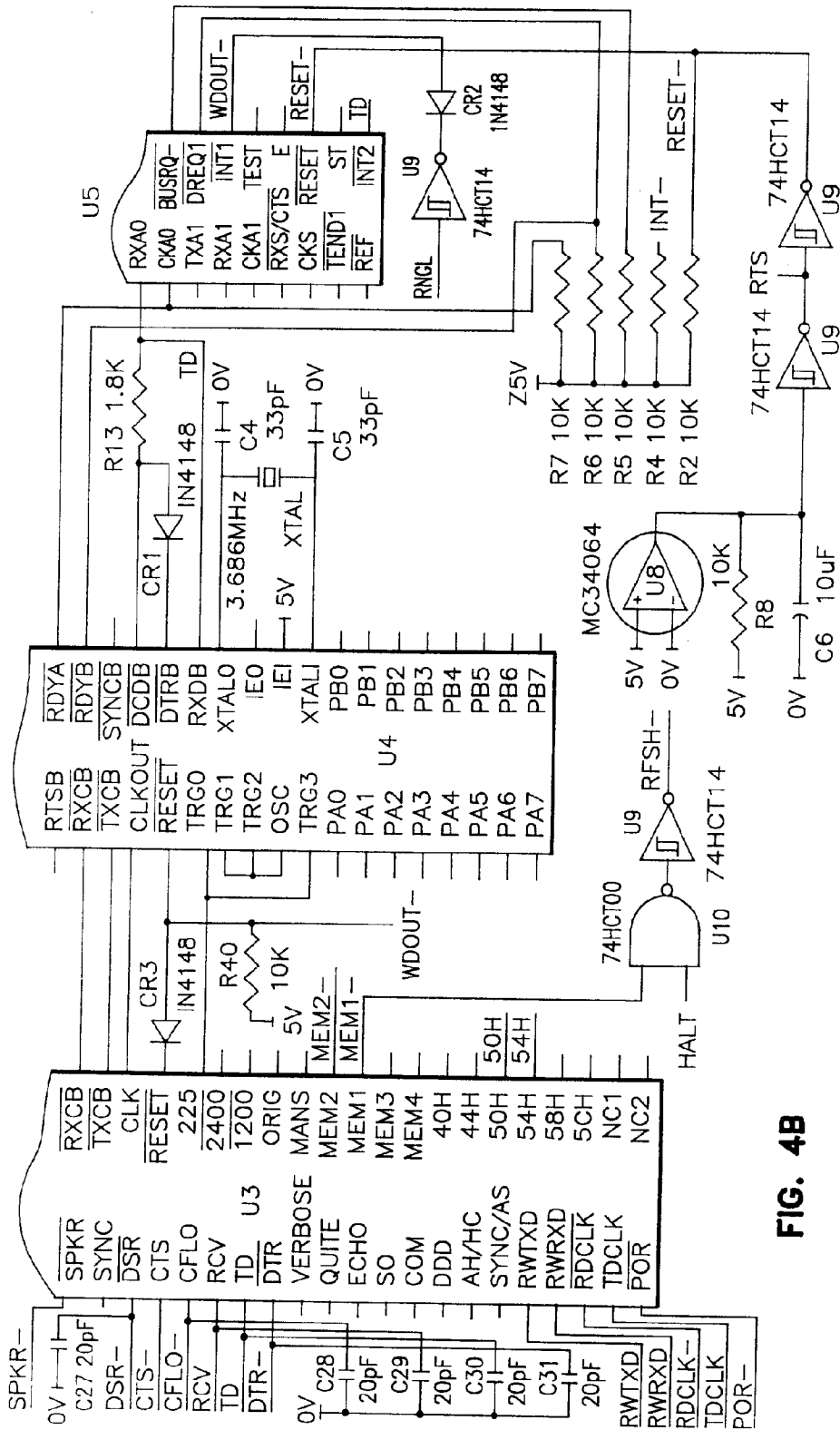


FIG. 4B

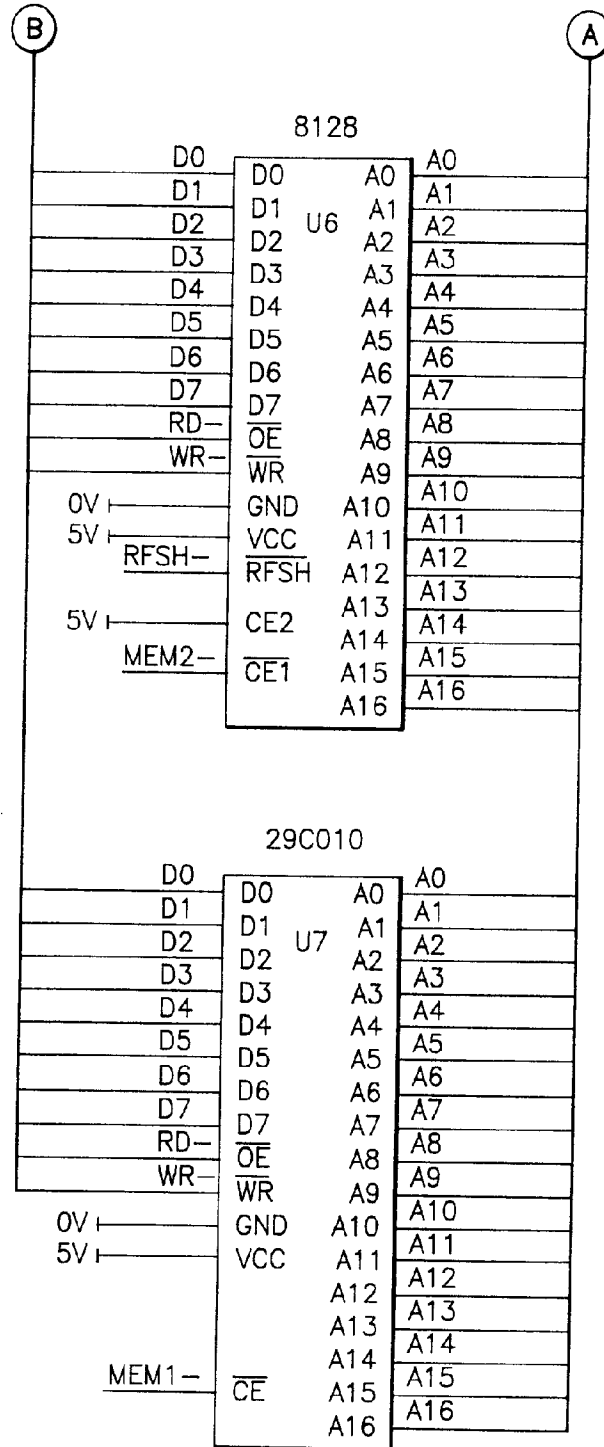
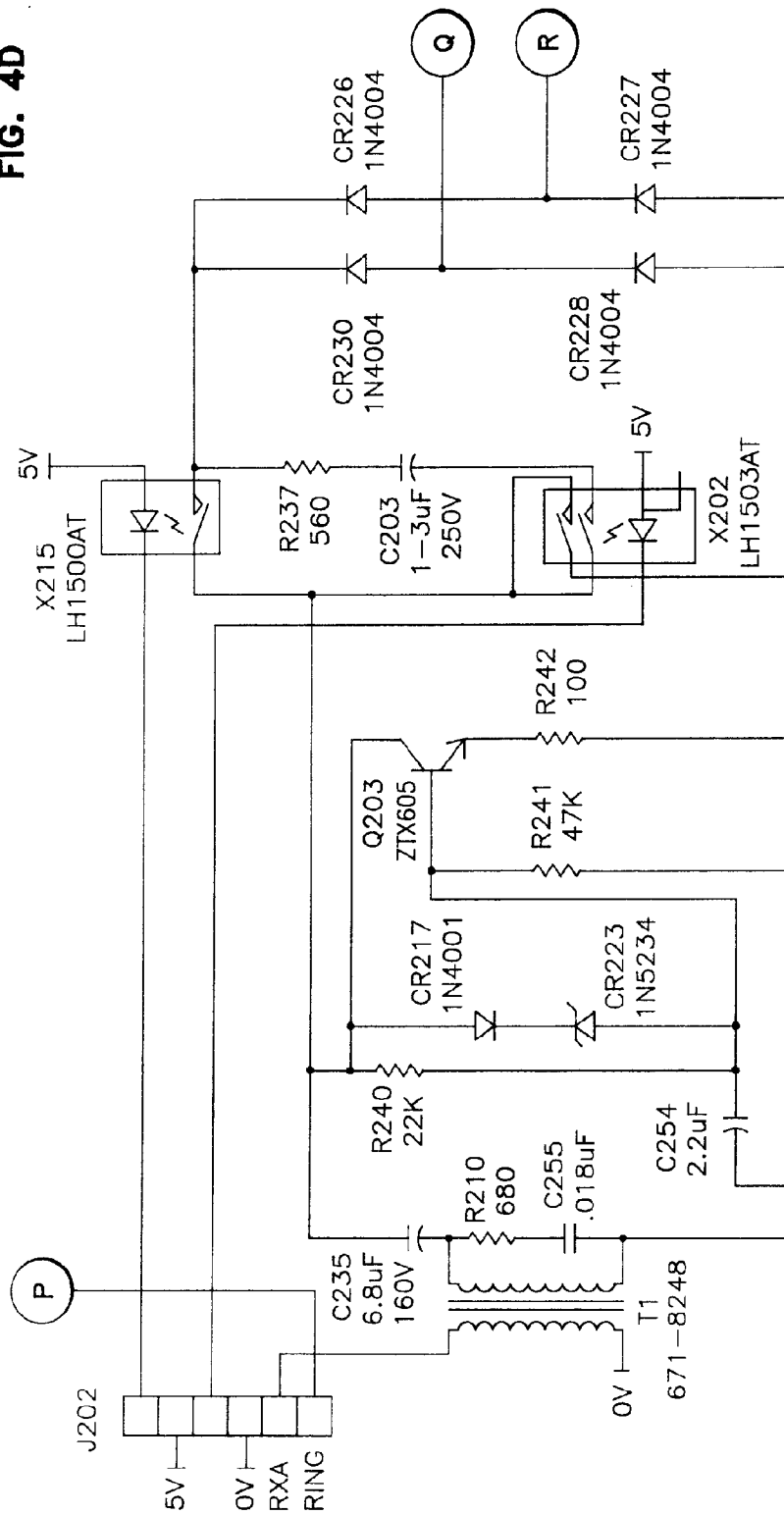


FIG. 4C

FIG. 4D



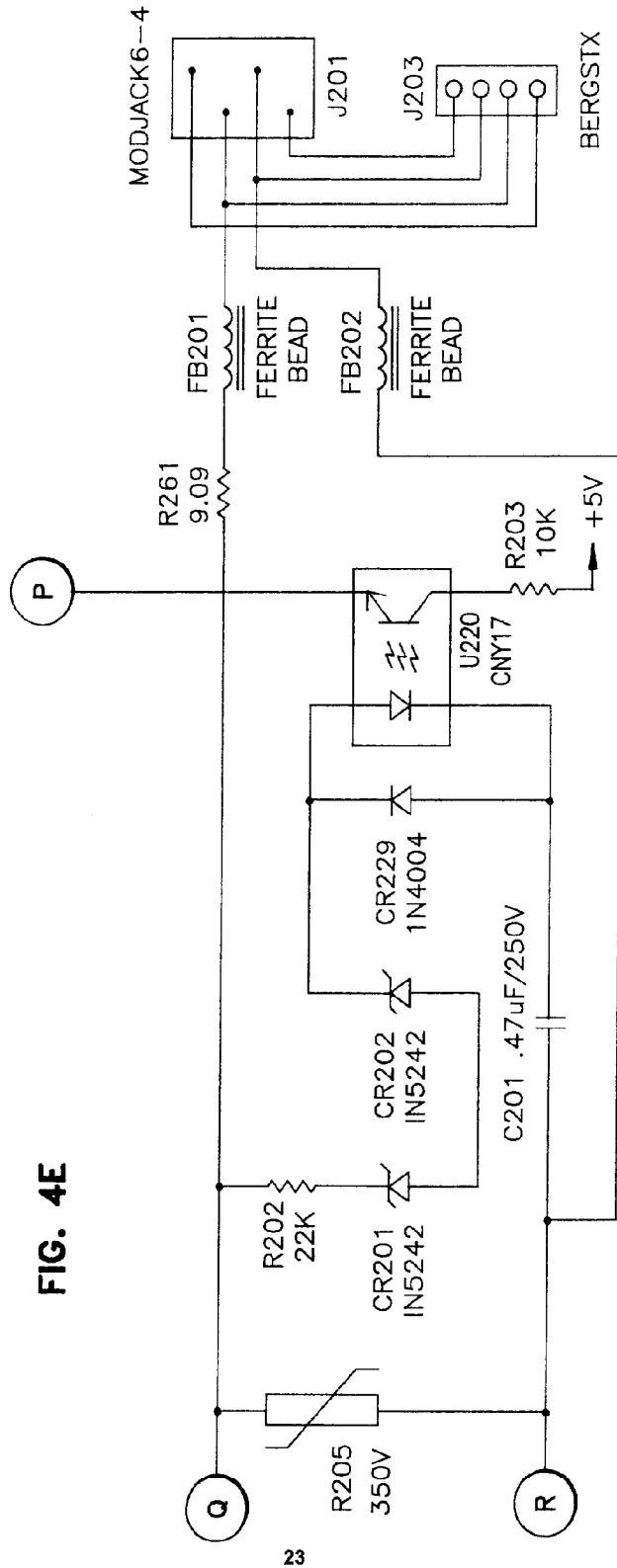


FIG. 4E

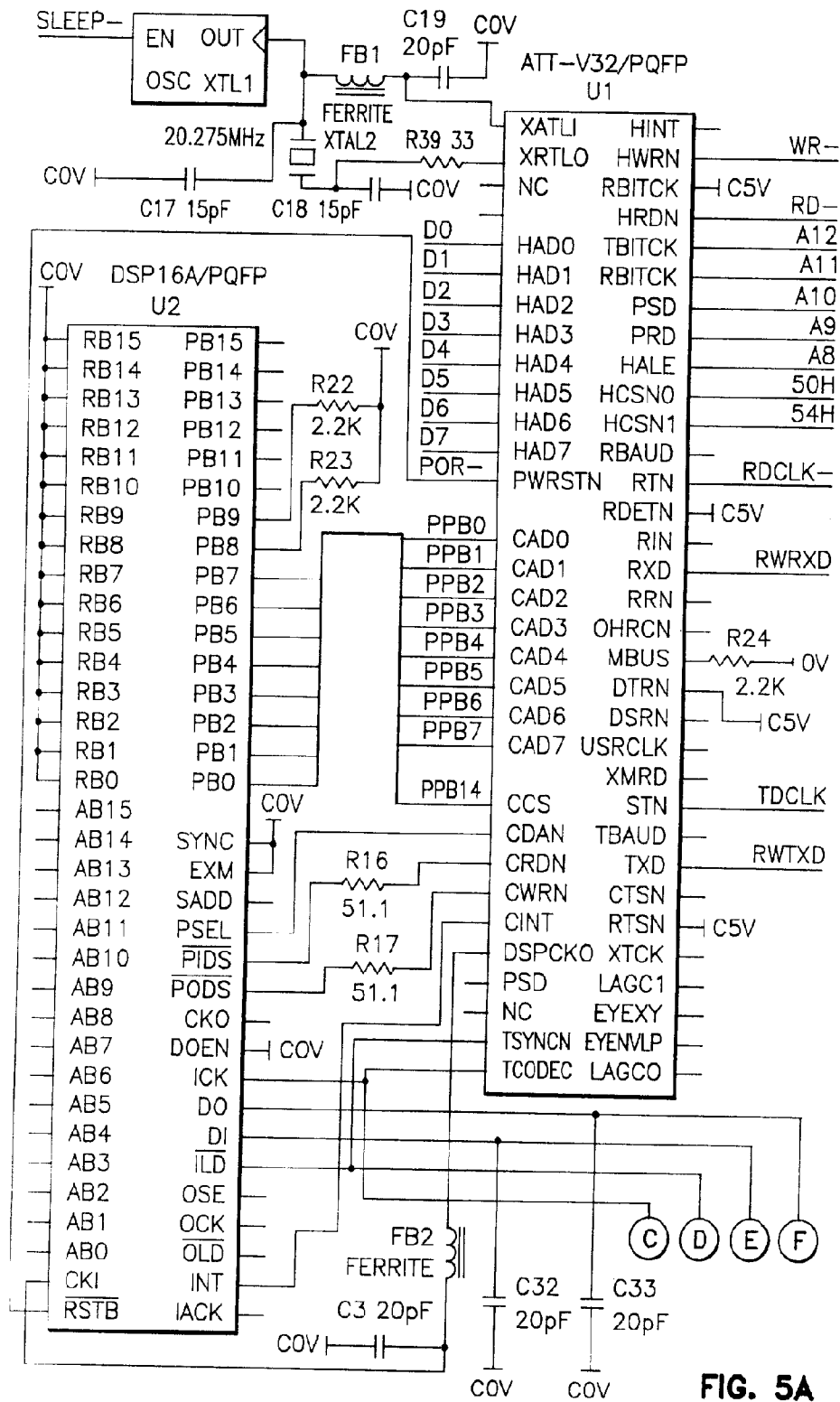


FIG. 5A

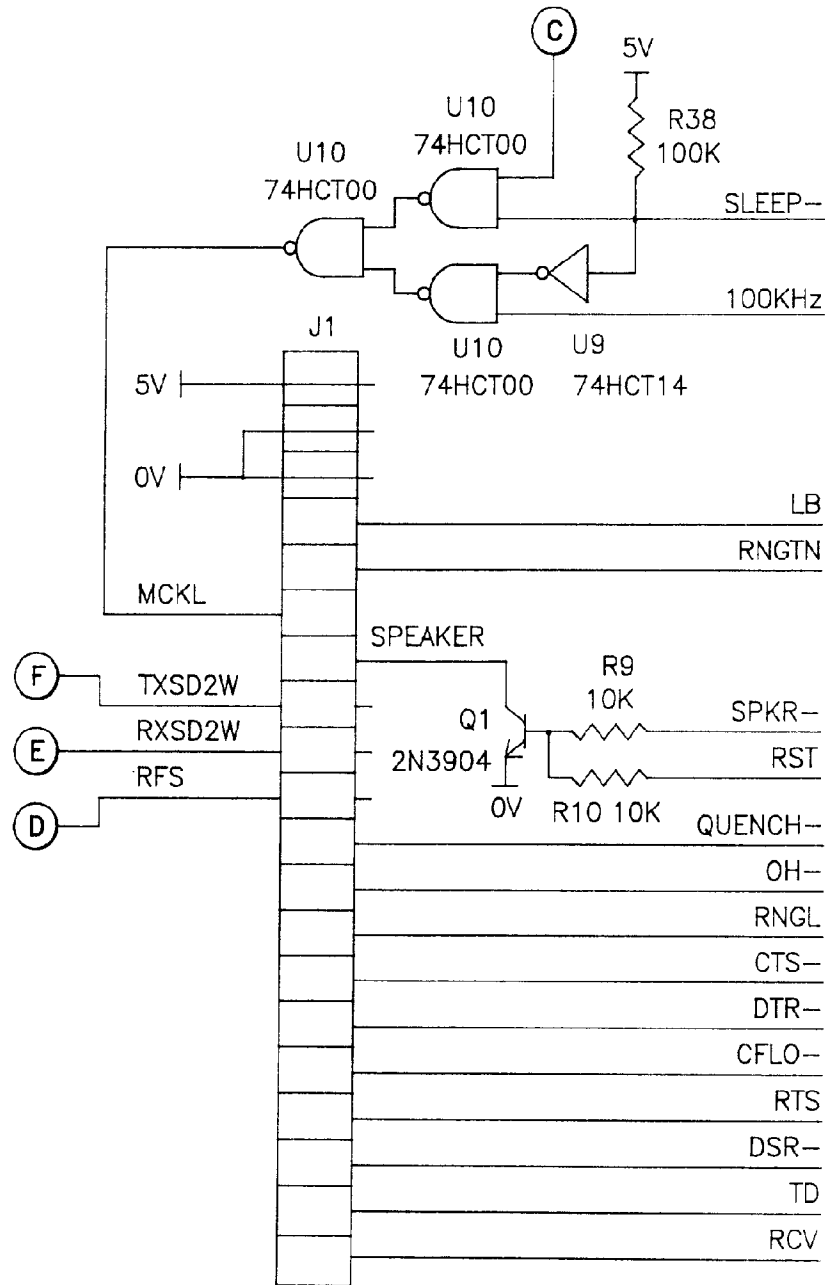


FIG. 5B

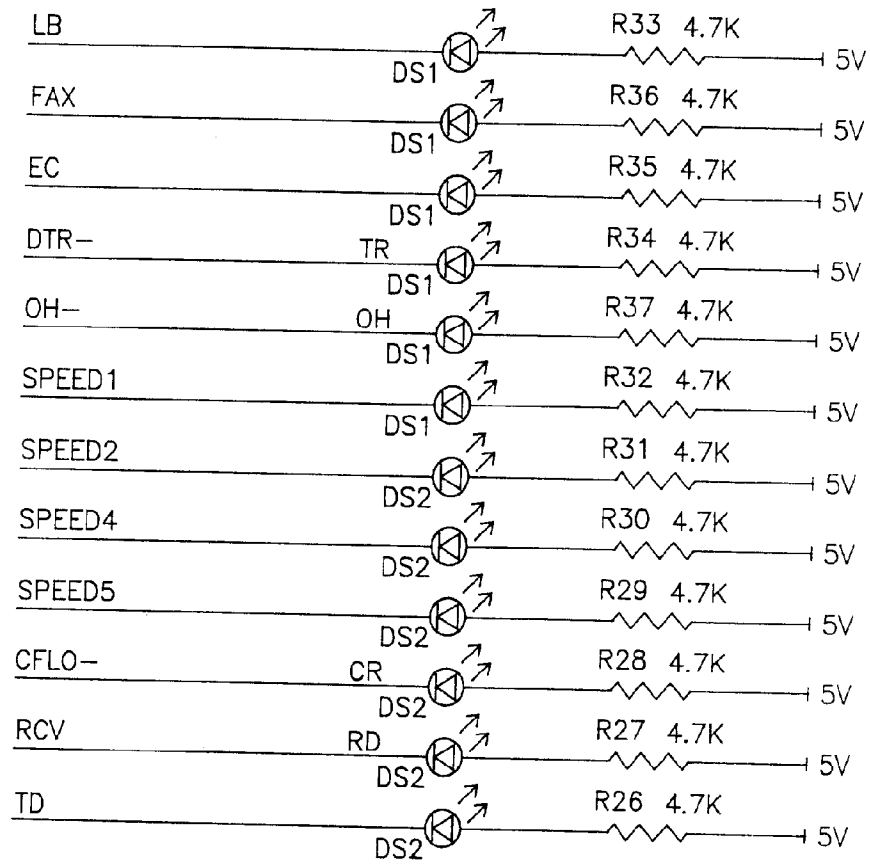


FIG. 5C

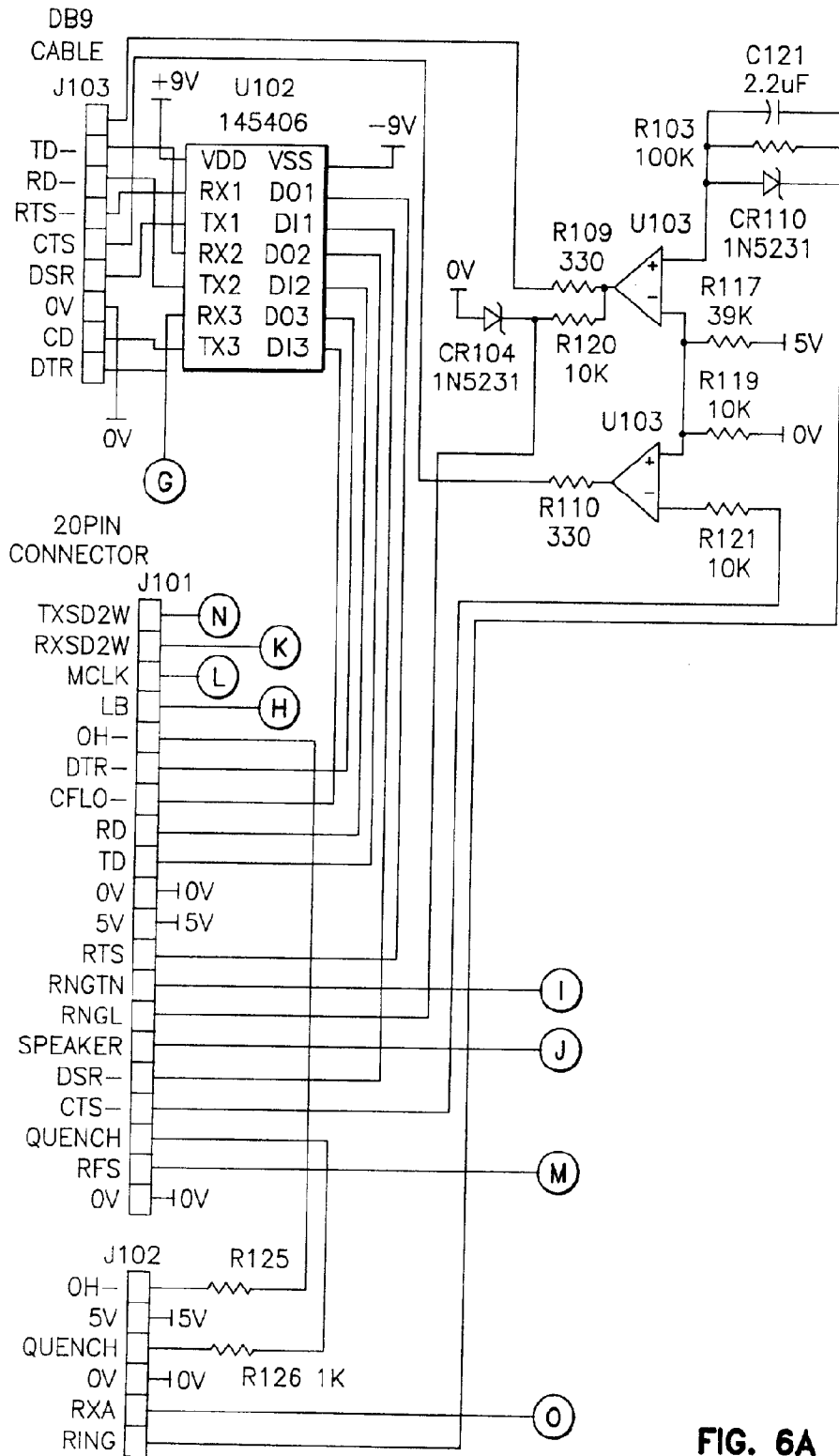


FIG. 6A

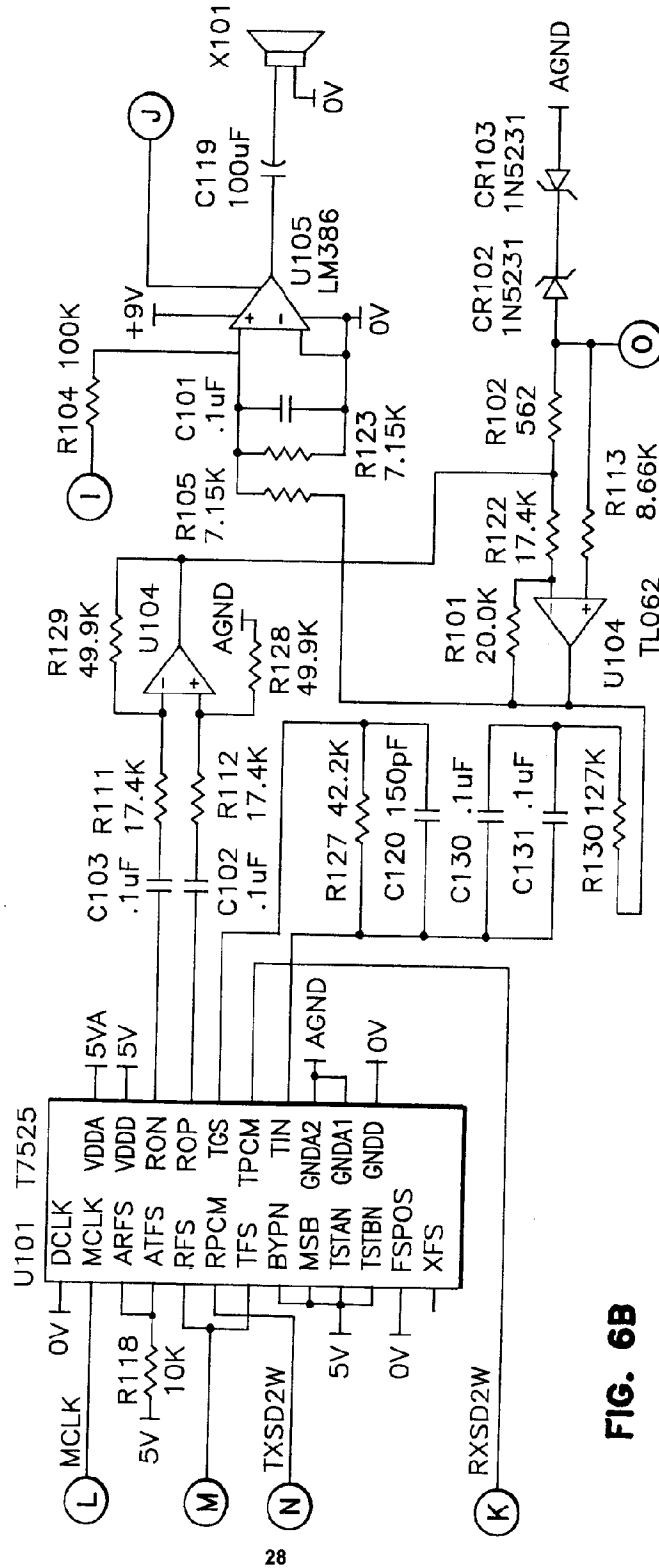


FIG. 6B

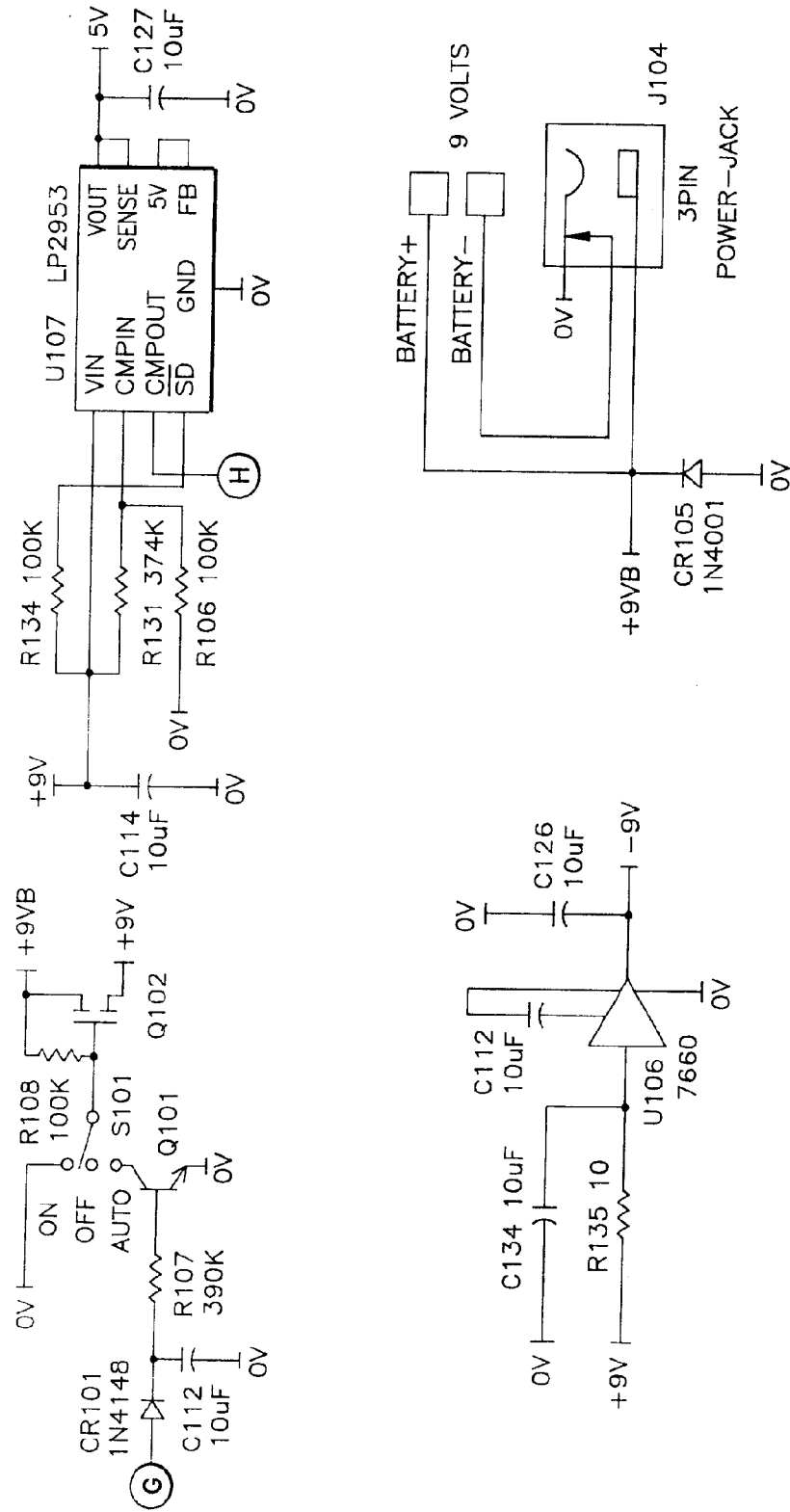


FIG. 6C

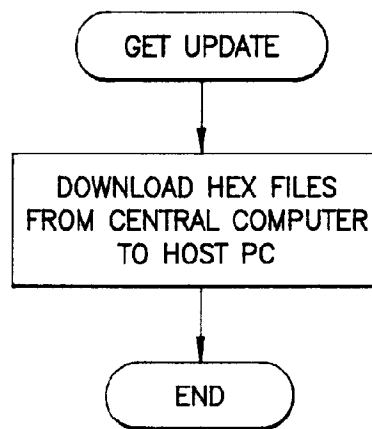


FIG. 7

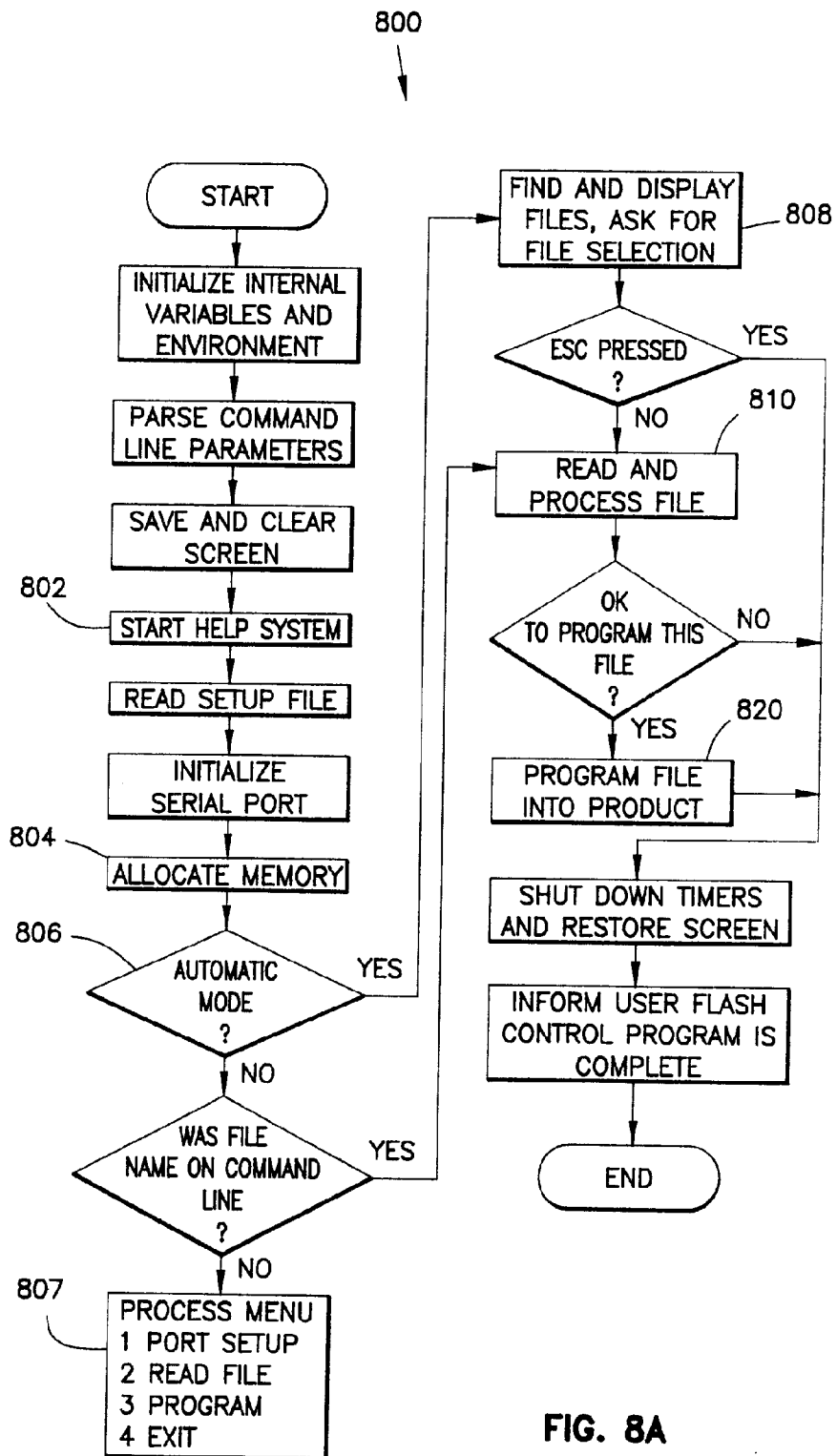
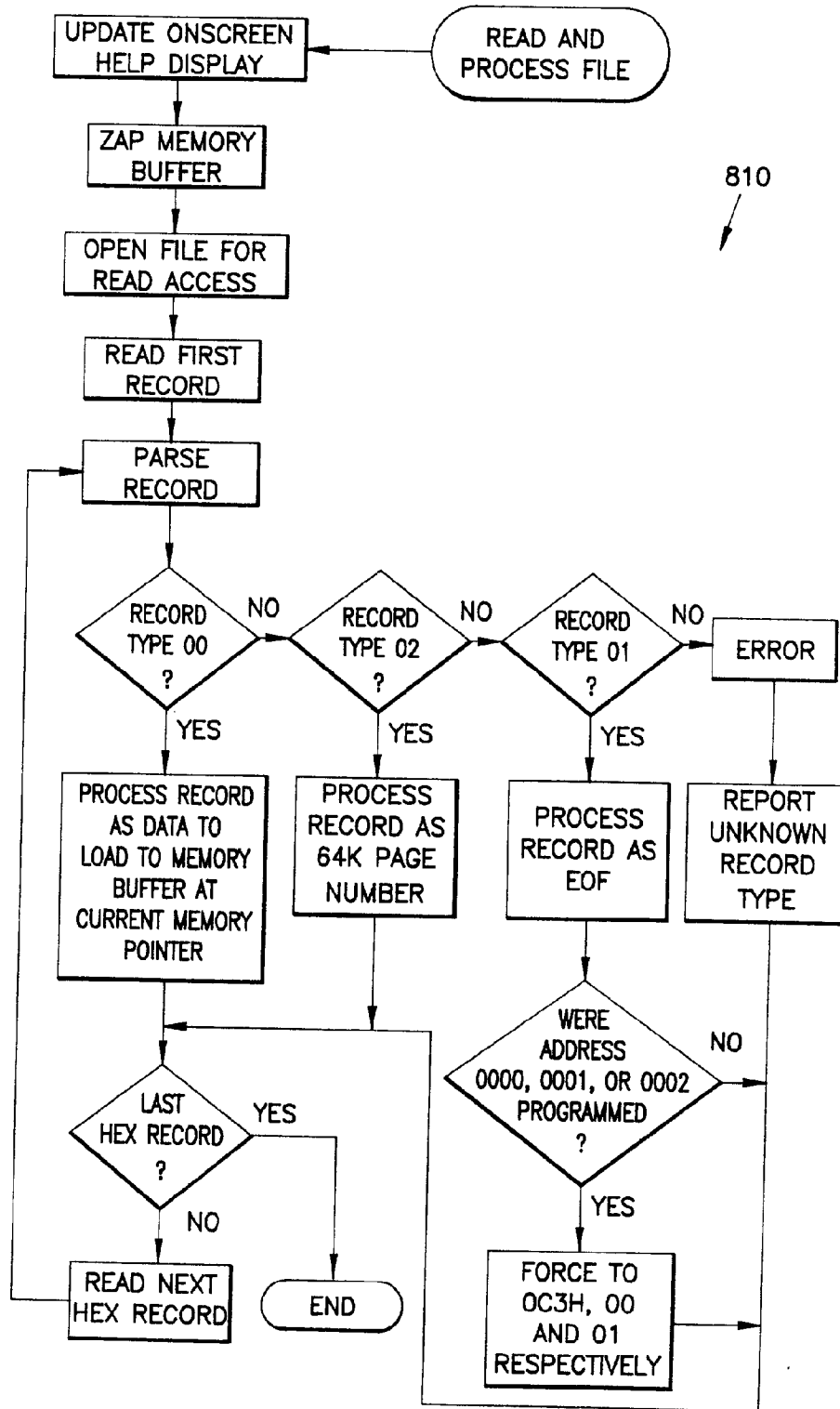


FIG. 8A

FIG. 8B



810

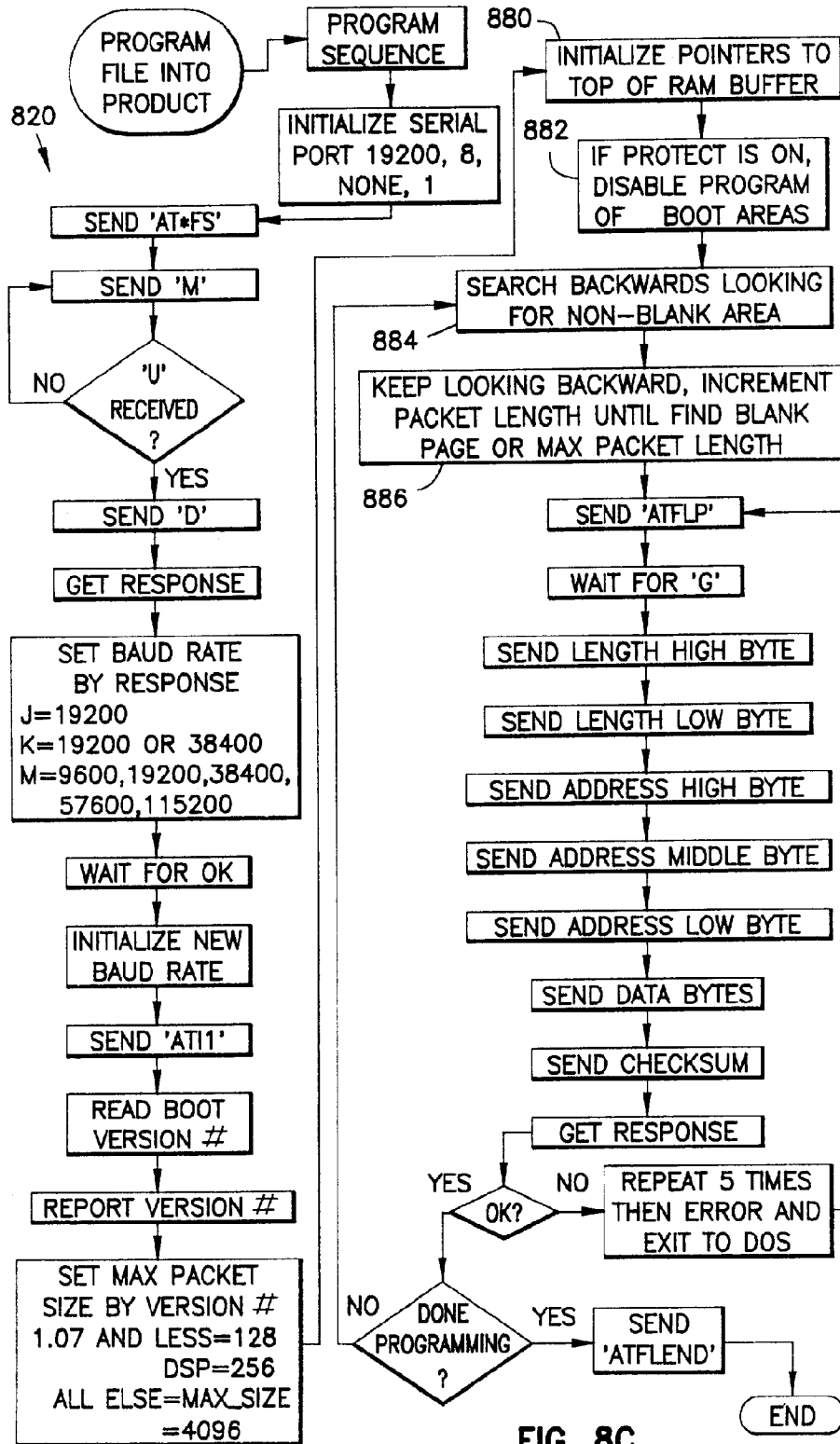


FIG. 8C

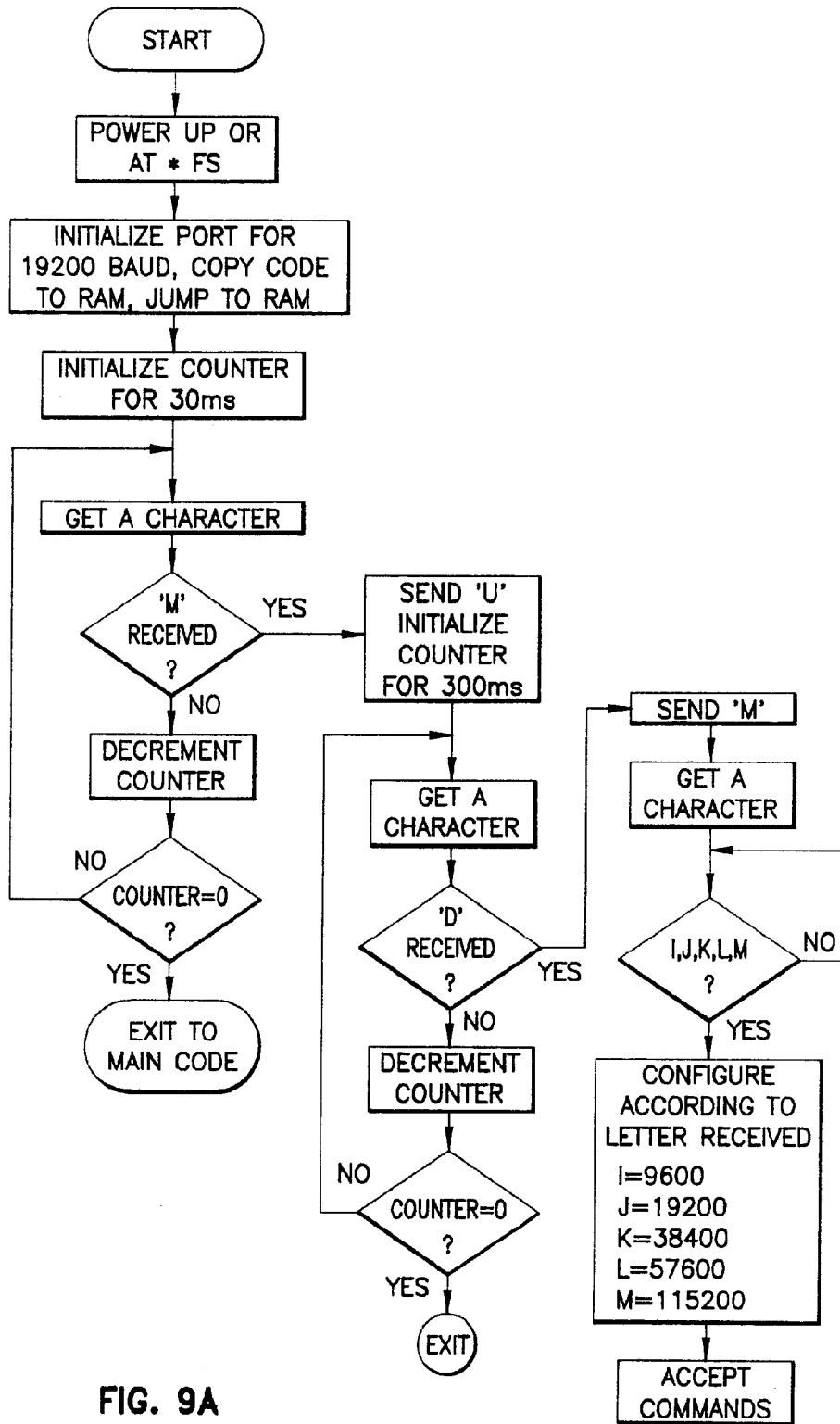


FIG. 9A

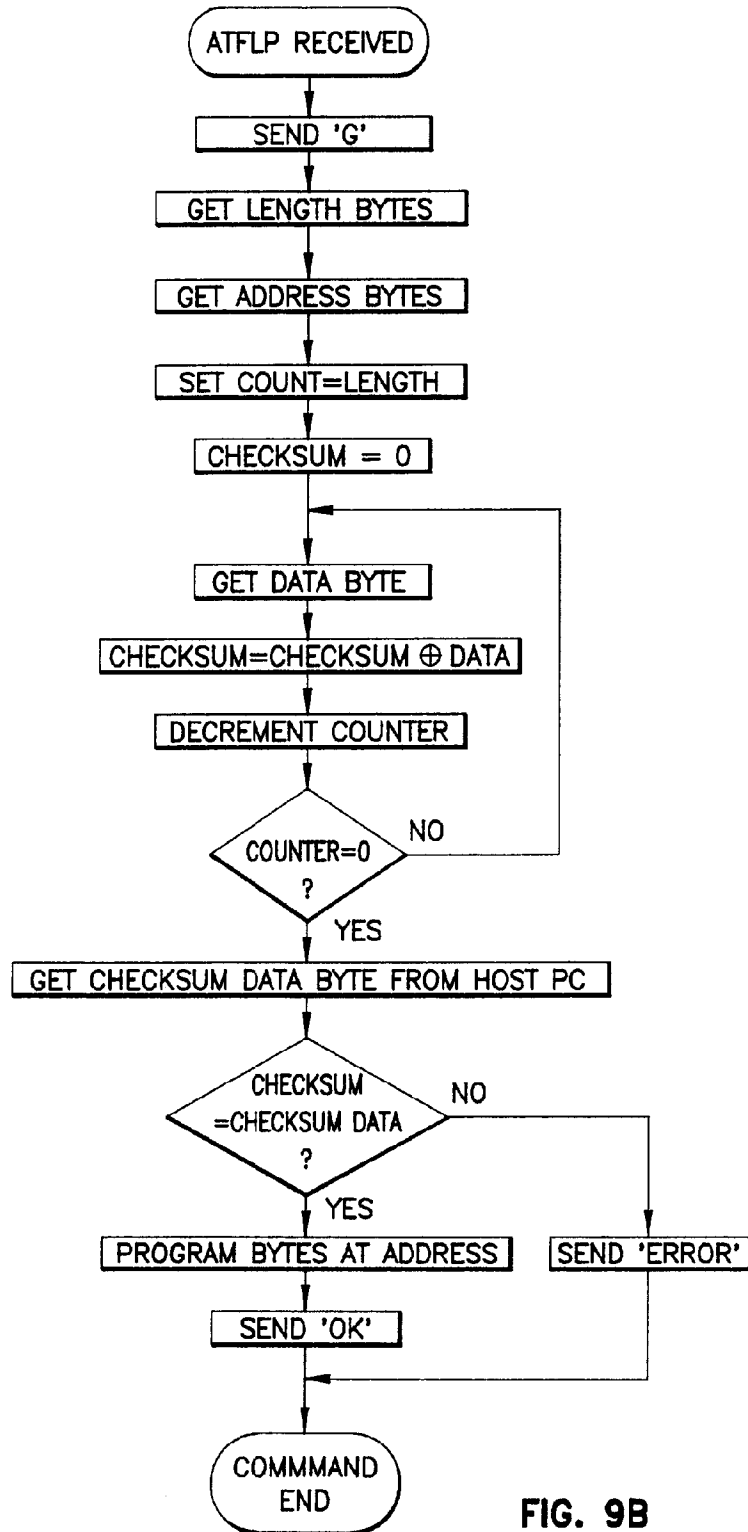


FIG. 9B

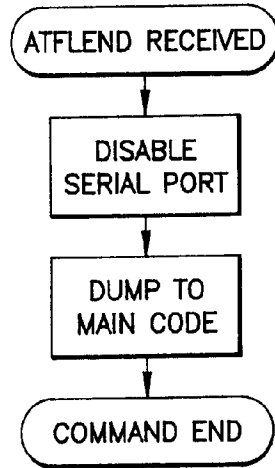


FIG. 9C

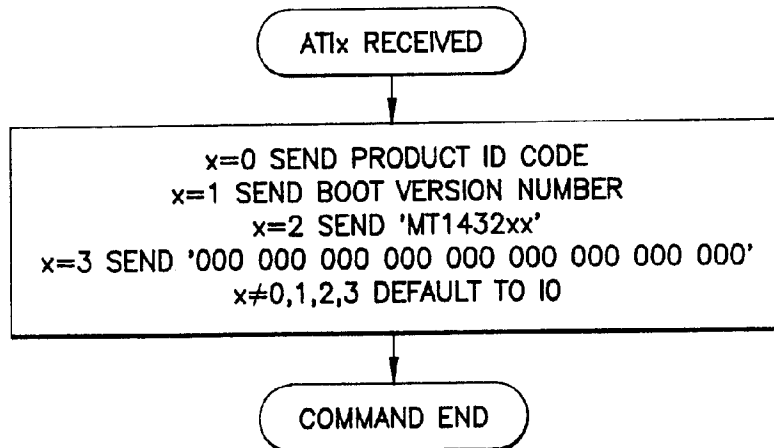


FIG. 9D



European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 94 30 4741

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	IBM TECHNICAL DISCLOSURE BULLETIN., vol.26, no.1, June 1983, NEW YORK US pages 261 - 262 'Dynamic Setting of Modem Parameters'	1,2,4,5, 7-11	H04L29/06
Y	* the whole document * ---	3,6,12	
Y	IBM TECHNICAL DISCLOSURE BULLETIN., vol.35, no.5, October 1992, NEW YORK US pages 425 - 427 'Technique for Power Management in Signal Processors'	3,6,12	
A	* the whole document * ----- IBM TECHNICAL DISCLOSURE BULLETIN., vol.35, no.4B, September 1992, NEW YORK US pages 398 - 399 'S-register Retention Method at Suspend Resume Operation for Internal Modems'	3,6,12	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			H04L
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 7 October 1994	Examiner Goossens, A
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 150 (04/92) (P06C01)



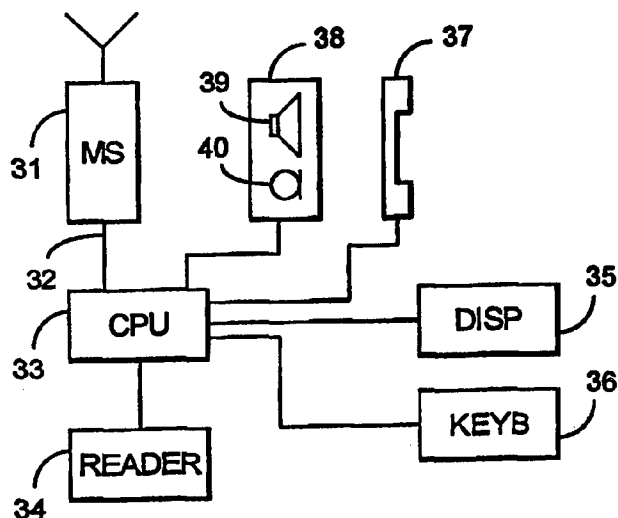
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁶ : H04Q 7/22</p>	<p>A1</p>	<p>(11) International Publication Number: WO 96/42175 (43) International Publication Date: 27 December 1996 (27.12.96)</p>
<p>(21) International Application Number: PCT/FI96/00321 (22) International Filing Date: 31 May 1996 (31.05.96) (30) Priority Data: 952906 13 June 1995 (13.06.95) FI (71) Applicant (for all designated States except US): NE-PRODUCTS OY [FI/FI]; Teknologiantie 18, FIN-90570 Oulu (FI). (72) Inventor; and (75) Inventor/Applicant (for US only): SAVOLAINEN, Kimmo [FI/FI]; Telkkäkuja 2, FIN-86100 Pyhäjoki (FI). (74) Agent: TEKNOPOLIS KOLSTER OY; Oy Kolster Ab, Iso Roobertinkatu 23, P.O. Box 148, FIN-00121 Helsinki (FI).</p>		<p>(81) Designated States: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p>Published With international search report.</p>

(54) Title: METHOD AND TERMINAL EQUIPMENT FOR TRANSMITTING INFORMATION NOT RELATING TO A CALL

(57) Abstract

The invention relates to a terminal equipment and to a method for transmitting information not relating to a call to a telephone user in a cellular radio system comprising a number of terminal equipments (20a-20c) and base stations (22a-22c) communicating over a radio path, in which method information not relating to the calls is sent from the system to the terminal equipments (20a-20c) which display the information in a display unit (35). For conveying versatile information effectively to a terminal equipment user, the display unit (35) of the terminal equipment is controlled in such a way that the display unit (35) displays alternately call-related information and information not relating to the calls.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AM	Armenia	GB	United Kingdom	MW	Malawi
AT	Austria	GE	Georgia	MX	Mexico
AU	Australia	GN	Guinea	NE	Niger
BB	Barbados	GR	Greece	NL	Netherlands
BE	Belgium	HU	Hungary	NO	Norway
BF	Burkina Faso	IE	Ireland	NZ	New Zealand
BG	Bulgaria	IT	Italy	PL	Poland
BJ	Benin	JP	Japan	PT	Portugal
BR	Brazil	KE	Kenya	RO	Romania
BY	Belarus	KG	Kyrgystan	RU	Russian Federation
CA	Canada	KP	Democratic People's Republic of Korea	SD	Sudan
CF	Central African Republic	KR	Republic of Korea	SE	Sweden
CG	Congo	KZ	Kazakhstan	SG	Singapore
CH	Switzerland	LI	Liechtenstein	SI	Slovenia
CI	Côte d'Ivoire	LK	Sri Lanka	SK	Slovakia
CM	Cameroon	LR	Liberia	SN	Senegal
CN	China	LT	Lithuania	SZ	Swaziland
CS	Czechoslovakia	LU	Luxembourg	TD	Chad
CZ	Czech Republic	LV	Larvia	TG	Togo
DE	Germany	MC	Monaco	TJ	Tajikistan
DK	Denmark	MD	Republic of Moldova	TT	Trinidad and Tobago
EE	Estonia	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	UG	Uganda
FI	Finland	MN	Mongolia	US	United States of America
FR	France	MR	Mauritania	UZ	Uzbekistan
GA	Gabon			VN	Viet Nam

Method and terminal equipment for transmitting
information not relating to a call

5 The present invention relates to a method for
transmitting information not relating to a call to a
telephone user in a cellular radio system comprising a
number of terminal equipments and base stations com-
municating over a radio path, in which method informa-
tion not relating to the calls is sent from the system
10 to the terminal equipments which display the information
in a display unit.

The invention also relates to a terminal equip-
ment in a cellular radio system, comprising a cellular
radio transceiver, a display unit, and means for receiv-
15 ing from the cellular radio system textual information
intended for the user and not relating to the calls to
be forwarded.

Conventional terminal equipments intended for
speech transmission that are used in cellular radio sys-
20 tems today have a display unit as well, through which
various types of information relating to calls and call
establishment can be conveyed to the user. Typically the
display unit displays for example the field strength of
the signal received by the terminal equipment from the
25 base station, the telephone number of the other sub-
scriber, and the duration of the call.

It is also possible to convey other text
information in the form of 'short messages' in digital
cellular radio systems. In such a case, the display unit
30 of the terminal equipment that received the short mes-
sage displays a brief message typically having a length
of a few words. The length of the message is limited by
the size of the display unit, which is very small in
typical terminal equipments. Short messages are one-time
35 user-to-user type messages, which are read once and

deleted from the memory of the terminal equipment. The implementation of short messages is described in detail in GSM specification TS GSM 03.40, which is incorporated herein by reference.

5 Solutions in accordance with the prior art are intended for user-to-user communication in which the delivered message can be discarded after reading. The prior art solutions are rather poorly suited to conveying long-term information.

10 It is an object of the present invention to enable conveying of various kinds of information to one or more terminal equipments simultaneously as the information necessary for the calls and call establishment is also visible to the user.

15 This object is achieved with a method as set forth in the preamble, which is characterized in that the display unit of the terminal equipment is controlled in such a way that the display unit displays alternately call-related information and information not relating to
20 the calls.

The terminal equipment set forth in the preamble is characterized in that it comprises means for controlling the display unit in such a way that the display unit displays alternately call-related information and
25 information not relating to the calls.

The method of the invention makes it possible to realize a versatile information service to terminal equipment users. The invention can be applied in any conventional cellular radio system.

30 As cellular radio systems are becoming more common and as their coverage areas are in many places replacing systems implemented with fixed wired telephone connections, it has become necessary to develop pay telephones utilizing cellular telephone systems. A need
35 for such telephones exists for instance in an area where

no fixed wire telephone connections have been constructed, or in applications in which a pay telephone is located in an environment where a connection to a fixed network is not readily available, for instance in moving
5 vehicles. The method of the present invention can be applied with particular advantage in a system in which pay telephones have been implemented with terminal equipment. In that case, information services can be furnished on the display of the terminal equipment when
10 the telephone is in idle mode and also during calls.

Information services may include any information that is of interest to customers, such as information on road traffic congestions in the surroundings of the terminal equipment, information on stock exchange quotations, or advertisements.
15

The method and the terminal equipment in accordance with the invention can be implemented in any cellular radio system, such as the NMT, AMPS, TACS and GSM. In the terminal equipment of the invention, it is
20 possible to apply the characteristics of the cellular radio systems effectively to the special requirements of a pay telephone. In particular, the above-mentioned information transfer can be realized for instance in the GSM and DCS systems by using 'short messages'. The
25 information can thus be conveyed during a call, and it is not necessary to reserve a separate radio channel for this purpose, but the information can be transmitted by means of signalling during the call.

In the following, the invention will be explained in greater detail with reference to the examples in accordance with the accompanying drawings, in which
30

Figure 1 is a schematic representation of the configuration of a pay telephone system,

Figure 2 schematically represents an example of
35 the transmission of a super message,

Figure 3 illustrates an example of the construction of a terminal equipment of the invention on block diagram level, and

5 Figure 4 illustrates a possible construction for the control unit by means of a block diagram.

In the following, the invention will be described in detail using as an example the digital GSM mobile telephone system, yet without being restricted thereto. It will be apparent that the terminal equipment
10 of the invention can be implemented with minor modifications in any analog or digital cellular radio system, as stated previously.

In a preferred embodiment of the invention, the terminal equipment displaying extra information is a pay
15 telephone, but the invention may likewise be applied to terminal equipments in normal use.

Figure 1 illustrates the configuration of a pay telephone system to be realized in a cellular radio network. The system comprises a number of pay telephones
20 20a-20c, each communicating with base stations 22a-22b via a radio path 21a-21c. With regard to the radio path and the base station, the terminal equipments serving as pay telephones are no different from conventional subscriber terminal equipment. The base stations 22a-22b
25 typically communicate with base station controllers 24a-24b via transmission links 23a-23b, which can be implemented with an optical cable, copper wireline or radio relay link, and each base station controller controls several base stations. The base station
30 controllers 24a-24b in turn communicate with a mobile exchange 26 via transmission lines 25a-25b, said mobile exchange controlling the operation of the base station controllers and forwarding the calls from the terminal equipments further to a fixed network or to other parts
35 of the cellular radio system through transmission lines

27.

In the exemplary GSM system, the control equipment 30 of the pay telephone system is connected for instance by using an X.25 connection 29 to a short message service centre 28, which in turn communicates with GSM cellular networks and the mobile exchanges thereof. The above description of a cellular radio system thus relates to the GSM system, but it is obvious that even though the construction in other systems differs in its details from that which is described, there are no differences as regards the essential parts of the construction. It should be noted that it is possible to realize a pay telephone system without a short message service centre also in the GSM system by connecting the control equipment 30 of the pay telephone system to the cellular radio system in other known ways, for instance by means of a modem.

In a preferred embodiment of the invention, the control and management of the information to be displayed to the customer, i.e. to the user of the terminal equipment, are incorporated in the pay telephone control equipment 30. The same information may be transmitted to one or several terminal equipments controlled by the control equipment.

In a preferred embodiment of the invention, the information to be displayed to the customer, i.e. to the user of the terminal equipment, is delivered to the terminal equipment in the form of short messages. The communication protocol is based on the use of a super message consisting of one or more short messages. The short message service of the GSM is based on sending separate independent messages. In the solution in accordance with the invention, a sequence number is attached to each message of the super message for the detection of transmission error situations. The recipient of the message

acknowledges the receipt of the message to the sender. The reason for a negative acknowledgement may be reception of an incorrect super message, which is detected on the basis of the sequence numbers or check sums for the messages.

The control equipment 30 of the pay telephone system thus forwards the messages to the short message service centre 28, which handles the relaying of actual short messages to all addressed terminal equipments. In the solution in accordance with a preferred embodiment of the invention, the communication protocol is efficient, because simultaneously as the control equipment 30 sends super messages to the pay telephones, it can receive acknowledgements of short messages sent by the short message service centre 28.

The following is a description of the structure of a super message in accordance with the invention. The super message SprM consists of one or more separate short messages SMi:

$$\text{SprM} = \text{SM}_0 + \text{SM}_1 + \dots + \text{SM}_n.$$

Each short message SMi has a Short Message System Part SMSi, e.g. information on the sender and recipient. The structure of the Short Message System Part is described in detail in the GSM specification 03.40 referred to above. In addition to the system part, each message comprises a Short Message User Part SMUi that contains the actual message to be sent:

$$\text{SM}_i = \text{SMS}_i + \text{SMU}_i, \text{ where } i = 0 \dots 254.$$

The structure of the Short Message User Part may be illustrated by the formula

35

7

$$\text{SMU}_i = \text{Id} + \text{SM_No} + \text{Data} + \text{Check_Sum}$$

where Id is the identification of the super message, preferably having a length of 1 byte, SM_No is the short message sequence number, preferably having a length of 2 bytes. Data is the information to be sent, having a length of 1 - n bytes, and Check_Sum is a modulo 256 sum of bytes in SMU, having a length of 1 byte.

Figure 2 illustrates an example of a situation in which a super message consisting of three short messages SM0, SM1, SM2 is sent. The pay telephone system control equipment PMS transmits the messages to the short message service centre SM-SC, which acknowledges the received messages and relays them further to the pay telephone PP. The pay telephone PP acknowledges the received messages to the short message service centre SM-SC, and the acknowledgement is also transmitted to the pay telephone system control equipment PMS. The short message service centre sends an indication of the delivery of the acknowledgement to the pay telephone.

Figure 3 illustrates an example of a preferred embodiment of a terminal equipment of the invention. The terminal equipment of the invention comprises a cellular radio transceiver 31 and a control unit 33 connected directly to the transceiver 31 without a two-wire connection. The terminal equipment of the invention also comprises a collecting means 34 connected to the control unit 33. The terminal equipment typically also comprises a dialling means 36 with which a desired telephone number is dialled, display equipment 35, and a receiver 37. The terminal equipment may also comprise means 38 enabling a hands-free facility, comprising a loudspeaker 39, a microphone 40 and the required amplifiers. Some or all of the above components may, if desired, be directly

integrated into the transceiver 31, but they may also be implemented as separate means, even if structurally within the same casing.

5 The purpose of the collecting means 34 is to enable the user to be charged for executing a call in accordance with the current tariff and the characteristics of the call executed. The collecting means 34 can be implemented in a variety of known ways. A typical
10 implementation is to use a call card reading/writing device. The cards used may be for instance disposable cards which contain a certain amount of talk time and which cannot be reloaded. It is also possible to use loadable call cards, various smart cards or credit
15 cards. When credit cards are used, the control unit 33 must be capable of checking the credit standing. It is also possible to use 'proximity cards', i.e. cards that are read and written into without any physical contact between the reading device and the card, in the equip-
20 ment. Hence the use of wearing parts in the device is obviated, such parts being included for instance in a magnetic card reading device. In such a case, the equipment may also be implemented without any openings in the exterior, which will reduce the possibility of van-
dalism.

25 The purpose of the transceiver unit 31 is to establish a radio connection to a base station when required, in order that a call may be forwarded. The unit 31 also handles all procedures relating to the main-
30 tenance of the radio path and the call that are normally the task of a mobile telephone. The unit 31 also receives the short messages transferred by the base station and transmits them to the control unit 33 for processing. Likewise, the unit 31 sends acknowledgements of received short messages to the base station under the
35 control of the control unit 33.

The purpose of the control unit 33 is to control the pay telephone. The control unit typically comprises a microprocessor, fixed and reprogrammable memory circuits, multiplexing means and switches. The control unit controls the operation of the other units of the equipment, keeps a record of the calls executed and handles the charging.

Figure 4 illustrates a possible way of embodying the control unit 33. In the figure, the control unit is connected to the transceiver unit via a bus 32, and the control unit is provided with a bus buffer 41, which can be implemented with separate components. The unit comprises a microprocessor 42, which may be for instance model Intel 80C32 or equivalent. The processor has connected to it detector means 43 detecting whether the performance of the processor program is interrupted owing to an error and restarting the processor when needed. The control unit further comprises memory means 44, into which a program code is stored. The memory means 44 can be implemented for instance with a 'flash memory circuit', which can be updated. The control unit further comprises second memory means 45, into which for instance payment transaction data and received short messages are stored. The second memory means 45 are battery secured. The unit further comprises buffering means 46, 47, of which the buffer 46 serves as a data out buffer, with outgoing lines 48 for controlling the collecting means 34, to audio switches, and for controlling the dialling means 36. The buffering means 47 serve as a data in buffer, with incoming lines connected for instance to the dialling means 36, the receiver 37, and the collecting means 34. Furthermore, there is a connection 50 from the processor 42 to the display means 35.

The display equipment 35 used may be for ins-

tance an LCD display, which is capable of displaying numerals, letters, and also graphics if desired. Typical information shown on the display is information relating to the state of the call and to charging.

5 Hence, the control unit 33 receives short messages from the transceiver 31 and typically stores them in the memory means 45. If the short message relates to the information displayed in the display means, the processor 42 controls the display means as called for by
10 the message, when necessary. In the solution in accordance with the invention the display means are thus controlled in such a way that they display to the user alternately the above call-related information, such as call time, call state and charging information, and
15 information not relating to the call, such as road traffic information, weather reports, advertisements, etc. The alternation can preferably be realized in such a way that information of both types is displayed for a fixed period at a time, whereafter a new type of information
20 is changed into the display. The fixed period may be for example 5 seconds.

The alternation time may also be determined by means of the short message, e.g. incorporating said time in the same short message as the information. The short
25 message may also contain an indication of how long the same information not relating to the call is repeated together with the call-related information, and when new information not relating to the call is substituted for the previous one. Another alternative is to use a fixed
30 value, for example 5 minutes, whereafter the information is changed.

The control of the display means 35 may be similar irrespective of whether the terminal equipment is actively participating in a call or in idle mode with no
35 ongoing call. When a call is in progress, the extra

information alternates with information relating to the proceeding of the call, and when the equipment is in idle mode, information relating to the field strength or other information facilitating call establishment or the use of the telephone can alternate with the extra information on the display. When the equipment is in idle mode, the display may naturally also be switched off, and the alternation of information may be applied only during a call.

10 The dialling means 36 can be preferably implemented by utilizing prior art for instance by means of a 5*4 matrix keyboard and a decoder. When a user depresses a key, the state of the depressed key is forwarded to the microprocessor, which reads the code of the depressed key from the decoder. The dialling means 15 36 may consist of dialling means comprised by the actual transceiver, or dialling means connected to the data bus of the transceiver or to the control unit. The dialling means 36 may be located in the receiver 37 or integrated 20 into the casing structure.

 The terminal equipment of the invention preferably comprises means 38 for enabling the hands-free facility. Said means can be implemented by using known components, and they comprise a loudspeaker 39, a microphone 25 40, and the required amplifiers for producing a sufficient volume level. The hands-free facility may be switched on by means of the dialling means 36, when desired.

 A pay telephone must forward information on the payment transactions to the system operator. In the terminal equipment of the invention, payment information can be conveyed preferably during calls, with no need to establish a radio connection separately for data transmission. The terminal equipment of the invention comprises means 31, 33 for transmitting the payment data of 35

the preceding call executed to the operator equipment 30 controlling the payment transactions during the next call executed at the terminal equipment without the call being disturbed or the caller being aware of the procedure in any way. In the preferred embodiment of the equipment of the invention, this is carried out by utilizing short messages, which for instance in the GSM system can be transmitted as signalling messages during the call.

10 In the GSM system, short messages are forwarded in a centralized manner to a short message service centre, wherefrom they are relayed further to a desired destination, which may be for instance another terminal equipment in some other system. In a preferred embodiment of the invention, the operator equipment is connected to a short message service centre, wherefrom the messages intended for the operator equipment are forwarded to destination. Short messages can be used in all data traffic between a pay telephone and the operator equipment, such as for transmitting call statistics, card blacklist information and credit card queries. The software of the terminal equipment and other parameters controlling the operation of the equipment can also be updated in said manner. Such parameters may include for instance barring of incoming calls or outgoing calls having specified area codes, or other corresponding facilities known from pay telephones.

The terminal equipment of the invention may be of fixed or mobile installation. Fixed installation means that the terminal equipment remains within the area of the same cell in a base station network. Such a terminal equipment may be for instance a pay telephone fixedly installed in a building or a telephone booth. A mobile installation in this context means that the terminal equipment may move from one cell to another in a

base station network. A terminal equipment of this kind may be for instance a vehicle-mounted pay telephone, such as one installed in a taxi or a bus, or a pay telephone installed in a train and moving with the train.

5 Even though the invention has been explained in the above with reference to examples in accordance with the accompanying drawings, it is obvious that the invention is not restricted to them but can be modified in a variety of ways within the scope of the inventive idea
10 disclosed in the appended claims.

Claims:

1. A terminal equipment in a cellular radio system, comprising a cellular radio transceiver (31), a display unit (35), and means (31) for receiving from the cellular radio system textual information intended for a user and not relating to the calls to be forwarded, characterized in that the terminal equipment comprises means (33) for controlling the display unit (35) in such a way that the display unit (35) displays alternately call-related information and information not relating to the calls.

2. A terminal equipment as claimed in claim 1, characterized in that the terminal equipment comprises means (31) for receiving from the cellular radio system a message consisting of one or more short messages, and means (33) for directing the message contained in the received message to the display unit (35).

3. A terminal equipment as claimed in claim 1 or claim 2, characterized in that the terminal equipment comprises means (33) for controlling the display unit (35) in such a way that the type of information displayed in the display unit (35) is changed at given intervals.

4. A terminal equipment as claimed in claim 1, characterized in that the terminal equipment comprises means (31) for receiving from the cellular radio system an indication of the desired interval after which the type of information displayed in the display unit (35) is changed.

5. A terminal equipment as claimed in claim 2, characterized in that the terminal equipment comprises means (33) for controlling the display unit (35) in such a way that the information not rel-

ating to the call alternately displayed in the display unit (35) is changed at given intervals.

5 6. A terminal equipment as claimed in claim 2, characterized in that the terminal equipment comprises means (33) for controlling the display unit (35) in such a way that the message contained in the received message is displayed to the user in two or more parts, which are displayed in succession at given intervals.

10 7. A terminal equipment as claimed in claim 2, characterized in that the terminal equipment comprises means (33) for storing several different messages to be displayed, and means (33) for controlling the display unit (35) in such a way that each stored message is displayed to the user in succession at given intervals.

15 8. A terminal equipment as claimed in claim 1, characterized in that the terminal equipment comprises a control unit (33) controlling charging operations and being directly connected to the cellular radio transceiver, and a collecting means (34) connected to the control unit (33).

20 9. A terminal equipment as claimed in claim 8, characterized in that the control unit (33) is connected to the cellular transceiver (31) via a bus interface (32).

25 10. A terminal equipment as claimed in claim 8, characterized in that the terminal equipment comprises means (31, 33) for transmitting the charging data of the previous call executed to the unit (30) controlling the payment transactions during the next call executed at the terminal equipment.

30 11. A method for transmitting information not relating to a call to a telephone user in a cellular radio system comprising a number of terminal equipments

35

(20a-20c) and base stations (22a-22c) communicating over a radio path, in which method information not relating to the calls is sent from the system to the terminal equipments (20a-20c) which display the information in a display unit (35), c h a r a c t e r i z e d in that the display unit (35) of the terminal equipment is controlled in such a way that the display unit (35) displays alternately call-related information and information not relating to the calls.

10 12. A method as claimed in claim 11, c h a r - a c t e r i z e d in that messages not relating to the calls are sent to the terminal equipments by means of one or more short messages.

15 13. A method as claimed in claim 11, c h a r - a c t e r i z e d in that the same message not relating to the calls is sent to one or more terminal equipments (20a-20c).

20 14. A method as claimed in claim 11, c h a r - a c t e r i z e d in that the display unit (35) of the terminal equipment is controlled in such a way that the information displayed in the display unit (35) is changed at given intervals.

25 15. A method as claimed in claim 14, c h a r - a c t e r i z e d in that an indication of the desired interval after which the information displayed in the display unit (35) is changed is sent to the terminal equipments (20a-20c) by means of short messages.

30 16. A method as claimed in claim 11, c h a r - a c t e r i z e d in that information not relating to the calls is displayed both when a call is in progress and when the telephone is in idle mode.

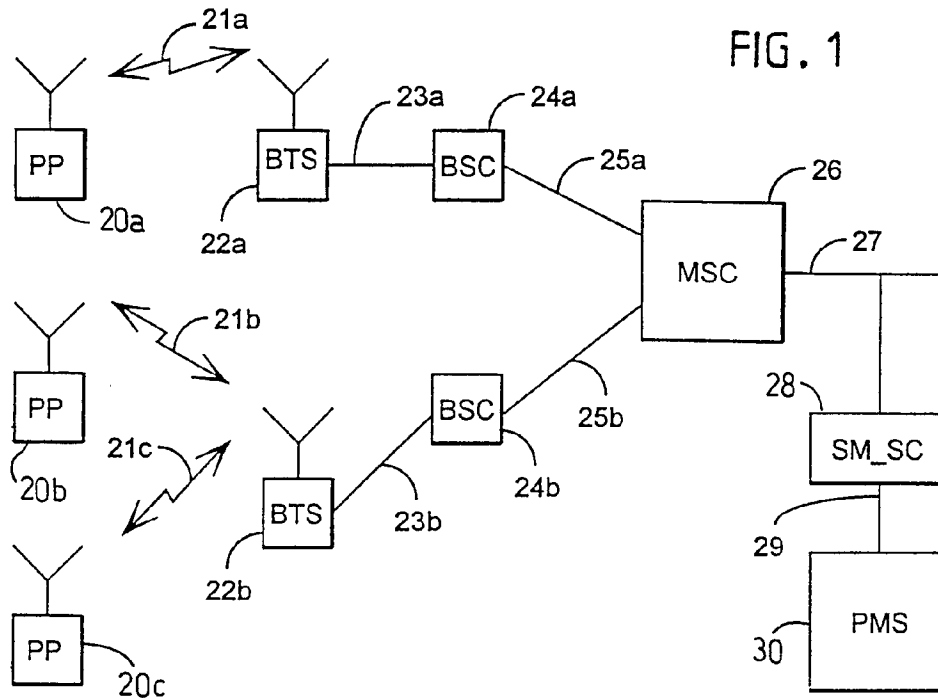
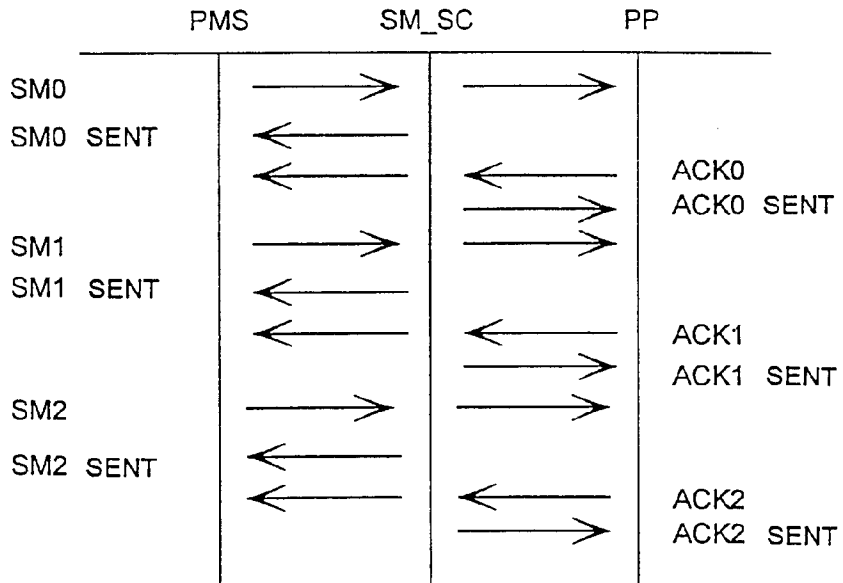


FIG. 2



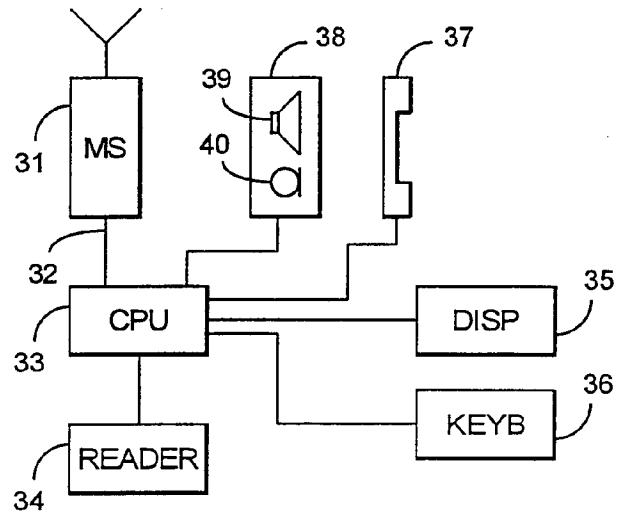


Fig. 3

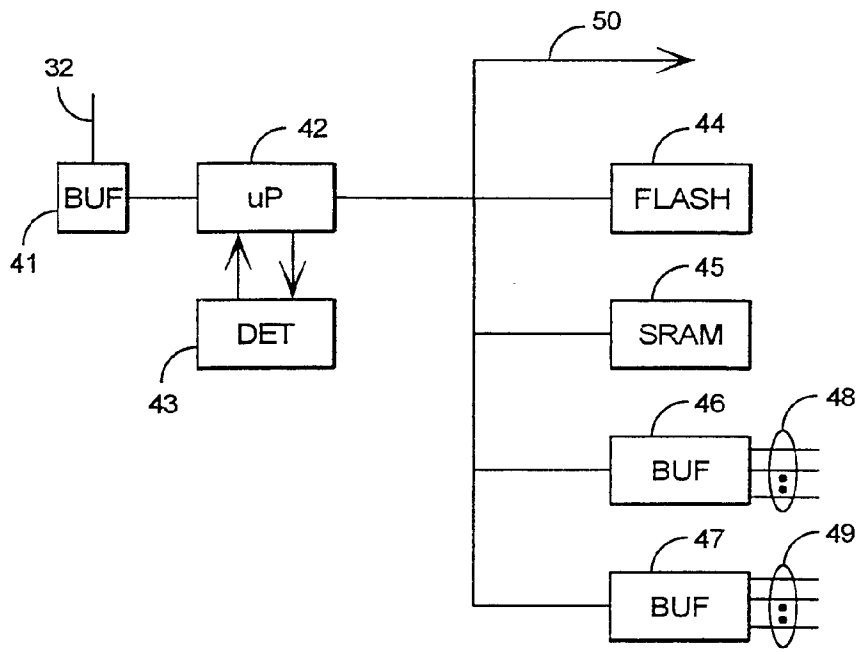


Fig. 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 96/00321

A. CLASSIFICATION OF SUBJECT MATTER		
IPC6: H04Q 7/22 According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
IPC6: H04Q		
Documentation searched other than minimum: documentation to the extent that such documents are included in the fields searched		
SE,DK,FI,NO classes as above		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	IEEE Electronics Division Colloquium, Volume, January 1991, Kevin Holley, "The GSM short message service", see page 2, 3rd piece; page 2, 5th piece and page 4 3rd piece --	1-6,9-15
Y	EP 0647055 A1 (AT&T CORP), 5 April 1995 (05.04.95), column 2, line 1 - line 21; column 3, line 31 - line 58 --	1-6,9-15
Y	GB 2272607 A (VODAFONE LIMITED), 18 May 1994 (18.05.94), page 1, line 21 - page 2, line 2; page 4, line 5 - page 7, line 20 --	1-6,9-15
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search		Date of mailing of the international search report
7 October 1996		08 -10- 1996
Name and mailing address of the ISA/ Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. +46 8 666 02 86		Authorized officer Christina Halldin Telephone No. +46 8 782 25 00

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 96/00321

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 9214329 A1 (TELENOKIA OY), 20 August 1992 (20.08.92), page 5, line 3 - line 33; page 13, line 22 - line 29 --	1-16
P,A	EP 0690639 A2 (VAISALA OY), 3 January 1996 (03.01.96), see whole document -- -----	1-16

Form PCT/ISA/210 (continuation of second sheet) (July 1992)



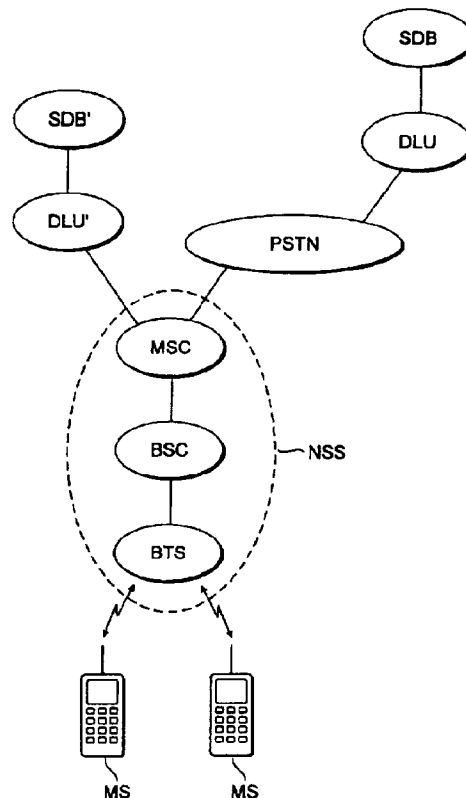
INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁶ : H04Q 7/32</p>	<p>A1</p>	<p>(11) International Publication Number: WO 97/16938 (43) International Publication Date: 9 May 1997 (09.05.97)</p>
<p>(21) International Application Number: PCT/FI96/00574 (22) International Filing Date: 29 October 1996 (29.10.96) (30) Priority Data: 955188 30 October 1995 (30.10.95) FI (71) Applicant (for all designated States except US): NOKIA TELECOMMUNICATIONS OY [FI/FI]; Upseerinkatu 1, FIN-02600 Espoo (FI). (72) Inventor; and (75) Inventor/Applicant (for US only): LEPPÄNEN, Reijo [FI/FI]; Kokinkyläntie 34 A, FIN-02200 Espoo (FI). (74) Agent: OY KOLSTER AB; Iso Roobertinkatu 23, P.O. Box 148, FIN-00121 Helsinki (FI).</p>		<p>(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p>Published With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments. In English translation (filed in Finnish).</p>

(54) Title: UPGRADING SOFTWARE IN A MOBILE TELEPHONE

(57) Abstract

A prior art method for upgrading a mobile station is to change at least partly software contained therein in a service shop, for example. This solution is not satisfactory to a user of a mobile station. In accordance with the invention, the mobile station (MS) is designed to that its software can be changed at least partly. A software database (SDB) connected to a mobile communication network (NSS) contains the most recent versions of the softwares of the mobile stations. A downloading unit (DLU) checks the softwares of the mobile stations by means of the database (SDB) and when necessary, loads the software into the mobile station.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AM	Armenia	GB	United Kingdom	MW	Malawi
AT	Austria	GE	Georgia	MX	Mexico
AU	Australia	GN	Guinea	NE	Niger
BB	Barbados	GR	Greece	NL	Netherlands
BE	Belgium	HU	Hungary	NO	Norway
BF	Burkina Faso	IE	Ireland	NZ	New Zealand
BG	Bulgaria	IT	Italy	PL	Poland
BJ	Benin	JP	Japan	PT	Portugal
BR	Brazil	KE	Kenya	RO	Romania
BY	Belarus	KG	Kyrgyzstan	RU	Russian Federation
CA	Canada	KP	Democratic People's Republic of Korea	SD	Sudan
CF	Central African Republic	KR	Republic of Korea	SE	Sweden
CG	Congo	KZ	Kazakhstan	SG	Singapore
CH	Switzerland	LI	Liechtenstein	SI	Slovenia
CI	Côte d'Ivoire	LK	Sri Lanka	SK	Slovakia
CM	Cameroon	LR	Liberia	SN	Senegal
CN	China	LT	Lithuania	SZ	Swaziland
CS	Czechoslovakia	LU	Luxembourg	TD	Chad
CZ	Czech Republic	LV	Latvia	TG	Togo
DE	Germany	MC	Monaco	TJ	Tajikistan
DK	Denmark	MD	Republic of Moldova	TT	Trinidad and Tobago
EE	Estonia	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	UG	Uganda
FI	Finland	MN	Mongolia	US	United States of America
FR	France	MR	Mauritania	UZ	Uzbekistan
GA	Gabon			VN	Viet Nam

Upgrading software in a mobile telephone

5 The present invention relates to upgrading of software, especially of speech coding software in mobile telephones. In some cases different operators of mobile communication networks may use a different speech coding algorithm. Alternatively, the software of a mobile station can be suitable in principle but a more recent version of it may have been developed.

10 Mobile communication systems develop rapidly. When facilities are added or improved, a problem will be how to add these facilities to existing mobile stations. Prior art for improving a mobile station is to change at least partly the software therein in a service shop. This solution is not satisfactory to a user of a mobile station. The maintenance of software in a service shop may not be a good solution for the service shop either as this work rather causes peaks in work load than permanent business.

20 The object of the invention is to upgrade software in a mobile station so that the mobile station need not be taken for this purpose to a service shop. The objects of the invention are achieved with the methods and systems that are characterized by what is stated in the independent claims. Preferred embodiments are disclosed in the dependent claims.

25 The invention is based on the idea that software in a mobile station is arranged to be at least partly variable in response to incoming signals from outside the mobile station. In some embodiments of the invention, actual executable code is transferred to a mobile station. In the second embodiments, the program best corresponding to the prevailing conditions is selected from the software preinstalled in the mobile station. In the third embodiments, the preinstalled and

30

35

externally loaded software modules cooperate in such a manner that at least parts of each are executed.

An advantage of the method and system of the invention is for a user of a mobile station primarily that when new facilities are added, the mobile station need not be changed or even taken to a service shop. This also gives a competitive advantage to the mobile station manufacturer. Another advantage for the manufacturer is that the testing of the product may be shortened and the introduction of the product to the market can be expedited if the product can be upgraded even after delivery. The advantage to a network operator is that facilities can be added more flexibly as the user has subscriber terminal equipments which are technically ready for the use of new facilities.

The invention will now be explained in more detail by means of preferred embodiments with reference to the accompanying drawings, wherein

Figure 1 shows the elements of the mobile communication system essential for the invention;

Figure 2 shows an exemplary form of one record of a software database;

Figure 3 shows process steps when the mobile communication system starts loading a program;

Figure 4 shows process steps when a mobile station starts loading a program;

Figures 5 to 6 shows different techniques for changing the software of a mobile station.

Figure 1 shows the elements of the mobile communication system essential for the invention. Mobile stations MS are connected to a base station BTS in a manner known per se. The base station BTS is connected to a base station controller BSC, which is, in turn, connected to a mobile services switching centre MSC. The network elements BTS to MSC form

Network SubSystems (NSS) connected to other subsystems and the public switched telephone network PSTN. The elements of the subsystem NSS may naturally have a tree structure in such a manner that several base stations
5 BTS may be connected to one controller BSC and similarly, several base station controllers BSC to one exchange MSC.

 In accordance with one embodiment of the invention, Downloading Units DLU attend to the loading
10 of software into mobile stations. Information on the software contained in the mobile stations is maintained in Software Database SDB. There may be only one or several software databases SDB. If the system includes only one software database SDB, all mobile services
15 switching centres MSC can be connected to this software database via the public switched telephone centre PSTN, for example. In this case, the software database SDB corresponds to a great extent to the home location register HLR of the mobile communication system. The
20 loading of software into the mobile station can be started for example so that when the mobile station is registering into the network, the network sends an inquiry to the mobile station about the software it contains. If the mobile station does not respond to the
25 inquiry in any way, the network deduces that the mobile station does not support this feature and the procedures will end. On the other hand, if the mobile station responds to the network as expected and indicates it contains the most suitable software, there
30 is no need for loading the software, and the procedure ends in this case, too. A need for loading the software arises only when the mobile telephone responds to the inquiry to the network relating to the software and the response contains an indication that the software of
35 the mobile station is not in all parts the most

suitable one for this network. When a new software is loaded into the software database SDB, it can update the software of the mobile station to correspond to the loaded software.

5 The network (and especially the software downloading unit DLU) then has to deduce how urgently the software should be loaded. If the mobile station is moving to an area of an operator where the used speech coding or other necessary program is not compatible,
10 the loading of software should be started immediately. On the other hand, if the network finds out that the mobile station supports full-rate speech coding, but not for example enhanced full-rate speech coding, the network may inform the mobile station that this
15 software supporting enhanced full-rate speech coding can be loaded. The user can then load the software at the required time by calling a specified service number, for example. The enhanced full rate speech coding in the GSM system used herein is only one
20 example of this feature. It is not essential for the invention how the speech coding program operates, but how this program can be transferred into a mobile station. The same method could be used for transferring a more advanced identification procedure, a power saving algorithm or the like.
25

 When software is loaded into a mobile station, the loading may take place on a traffic channel, for example, in such a manner that the whole capacity of one traffic channel is allocated to the loading of
30 software into one mobile station at a time. The network may then send first a header field containing information on the program to be loaded (program type, function, version, length, etc.). The header field is followed by the contents of the program divided for
35 example into several frames which may contain a

checksum. When the mobile telephone receives a frame, it calculates the checksum from the data contained in the frame and compares it to the sent checksum. If the checksums are equal, the frame is stored into memory. 5 If the checksums are different from one another, the mobile station may request the erroneous frame or the whole software to be loaded again. When the whole software is loaded (possibly after repeating some frames), it can be activated for use. "Activation" does 10 not necessarily mean that the program would be executed immediately but when said program is needed the next time.

As an alternative to loading the software at each connection, the network may send new programs on 15 some broadcast control channel to all mobile stations. This embodiment could be implemented by sending continuously new programs, for example.

Figure 2 shows an exemplary form of a record of the software database SDB. Field 202 shows the 20 equipment type of the mobile station and field 204 the equipment version. Similarly, the program version is in field 206. Field 208 shows the number of modules capable of being loaded into the mobile station. Fields 210 to 214 include identification data of the modules 25 in triplets: the identifier of the module, the initial header and the length of the module. The next three fields contain corresponding information for the next module. Field 208 indicates the number of these triplets. The program code of module 1 is in area 224, 30 of module 2 in area of 226, etc.

Although the easiest way to check the software of a mobile station is to compare the version numbers, it is not the only way. The compatibility of the software may be checked in other ways, for example by 35 means of a checksum or by testing how the mobile

station will respond to a specified message sent thereto.

Figure 3 shows process steps when the mobile communication system starts loading the software. Figure 3 shows an embodiment where the operation is initiated by the mobile station being turned on in the coverage area of the network (step 302). In step 304 the network informs the equipment register of the equipment and program versions in the mobile station. In step 306 the equipment register sends the equipment and program data to be checked by the DLU of the mobile station type in question. In step 308 the DLU checks if the mobile station already has the most suitable software for the mobile station type. In step 310 the DLU makes a special call to the mobile station when the mobile station is free and available. In step 312 the DLU requests the mobile station to send its identifier data. In step 314 the mobile station sends its identifier data, e.g. the equipment type and the software versions. In step 316 the DLU informs the mobile station of the new programs to be selected by the user. In step 318 it is inquired on the display of the mobile station (or alternatively, by an audio signal) if the user requires loading. In step 320 the DLU reads the program from the SDB and supplies it to the connection. In step 322 the mobile station informs the user by a text or audio message that loading has been terminated.

Figure 4 shows process steps when the mobile station starts loading the software. In step 410 the user makes a special call to the service number (the DLU) of the network. Steps 412 to 424 correspond to steps 312 to 324 explained in connection with Figure 3 and they will not be explained again.

In the following, the changes required by the

loading of software according to the invention are examined. In an ordinary mobile station software is generally installed in one read-only-memory (ROM) whose contents cannot be changed after the manufacturing stage. In this connection, "ROM" refers to a fixedly programmed memory whose contents cannot be changed at least with the equipment in the mobile station. "RAM" similarly refers to a memory whose contents can be changed with the equipment in the mobile station. "Program to be updated" refers to the part of the software in a mobile station to be changed. Furthermore, "version" in this context is to be understood to refer widely to all modifications and not just to modifications of a different age.

The software of a mobile station of the invention may be updated e.g. in the following ways: (i) the mobile station may contain in the ROM several alternative programs one of which is selected for execution; (ii) the same as (i) but the programs are located in the RAM, and (iii) the ROM and RAM of the mobile station can cooperate so that parts of both are executed.

Figure 5 shows how a mobile station may contain several programs in the ROM one of which is selected for processing. In program segments the left column signifies a label at the source code level and a corresponding address in the executable code. Pseudocode JMP in the second column refers to a jump to the label mentioned in the third column or to a corresponding address in the executable code. The ellipsis (...) represents the part of the program to be executed. The pseudocodes "EXIT" terminating programs Pa to Pc naturally restore control to an upper level program.

The ROM contains in this example three

alternative programs Pa to Pc of which at least one can be activated so that the execution of the program is preceded by a jump in the RAM to the address RAM1 to which is initialized a jump to the program (e.g. Pa) which is executed by default if not programmed otherwise. This default situation is described by unbroken arrows between the ROM and RAM. Any one of the programs Pa to Pc can be activated by writing a jump to the program in question in place of the jump instruction in the address RAM1 of the RAM. This change is illustrated by an arrow indicated with broken lines between the ROM and RAM. Before the program is executed, the processor of the mobile station can also make sure that the jump instruction in the address RAM1 contains a jump to a meaningful address. If this is not the case, the mobile station may initialize the jump instruction in the address RAM1 again to be directed to a program executed by default. The fact that the jump instruction is directed to a meaningful address can be ensured for example by calculating the checksum at least from part of the program to be executed. In order that the checksum need not be calculated from all the software, one check byte (CHKBYTE in this example) may be placed in front of the 3 byte jump instruction in the address RAM1 and the checksum can be calculated from the produced 4 byte area.

A restriction to the above described embodiment is that only such programs can be stored into the ROM whose contents are known at the manufacturing stage. In this way telephones can be manufactured to operate in the operation area of two or more network operators even when the operators require different programs.

If the contents of the program are not known at the stage when the mobile station is manufactured,

the contents of the program can be changed in such a manner that the mobile station contains the RAM to which one or more programs or at least parts of them are stored. The ROM and RAM preferably cooperate in such a manner that only the parts to be changed in the program have to be stored in the RAM. Figures 6A and 6B show an example of how the cooperation of the ROM and RAM can be realized. Figure 6a shows an initial situation. Some program in the ROM comprises three parts P1 to P3. As distinct from the situation in Figure 5, the parts P1 to P3 are not here alternatives but different parts of one program, all of which have to be executed. Execution of each part P1 to P3 is preceded by a jump to an address in the RAM, to the RAM1 to RAM3, respectively, to which a jump back to the parts P1 to P3 of the program in the RAM is initialized. One of these parts P1 to P3 can be replaced by a corresponding part in the RAM so that a jump to the replaced part of the program is written in the place of the jump instruction in the RAM. Replacing part P2 by a second part P2' is discussed as an example. A problem is caused by that the contents of the replacing part P2' and even its size are not known at the manufacturing stage of the mobile station. In the initial situation of Figure 6a the jump instruction of address RAM2 can be replaced only by an instruction of the same length (the length of the jump instruction is typically 3 bytes), without new data being written into the address RAM3. The address RAM3 cannot be transferred as in the address ROM3 of the ROM there is a jump to this address and the contents of the ROM cannot be changed. Referring to Figure 6B, the problem is solved in such a manner that the part P2' replacing the part P2 is placed in the empty part in the RAM and a jump instruction is placed in the address RAM2 at the

beginning of the replacing part P2'. As after executing the original part P2, the program proceeds to the address ROM3, a jump to the end of the part P2' should also be placed in the same address. As there is any
5 case a jump to the address RAM3 in this address, one jump instruction can be saved by terminating the part P2' by a jump instruction to the address RAM3, as shown by the arrow indicated with broken lines in Figure 6B.

The cooperation of the RAM and ROM saves
10 resources of the mobile station, such as storage capacity and program downloading time.

In the following it is examined how a program can be transferred into a mobile station. Several
15 embodiments are given for this: (i) the program may be loaded via the radio path; (ii) one of several preinstalled programs can be selected via the radio path; (iii) the program may be loaded by a smart card or a magnetic card; and (iv) the mobile station may cooperate with a general-purpose computer.

The loading of a program to a mobile station
20 has already been discussed in connection with the changes the technique requires of a mobile communication network. The selection of one of several preinstalled programs can be realized in the way
25 explained in connection with Figure 5, whereby information on the program to be executed is sent via the mobile communication network.

A program can be loaded to a mobile station by
30 a smart card or a magnetic card. In this case there are two alternatives in use: the program can be executed directly from a smart card or it can be copied therefrom to the RAM of the mobile station. In the last mentioned case it can apply the technique explained in
35 connection with Figure 6, by means of which the program of the mobile station can be only partly replaced.