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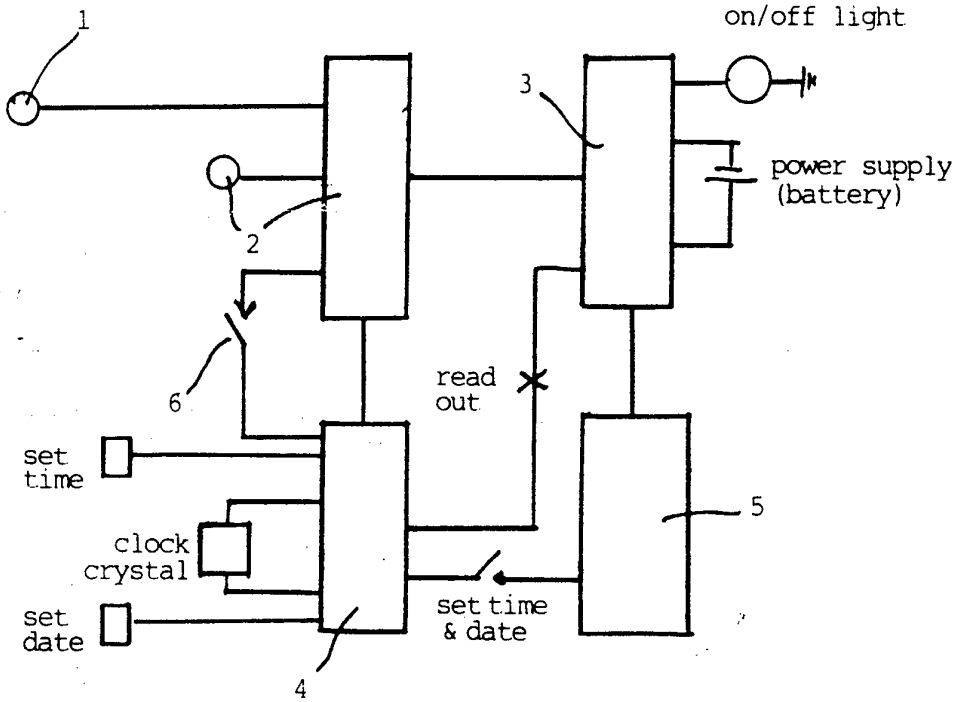

(57) Abstract

A light sensitive time and date recording and display apparatus which is adapted for mounting behind a transparent barrier at a selected location to record times and dates of security patrol events. The apparatus is operational by a portable torch of the type carried by security personnel. The event detector of the apparatus may comprise a light sensitive diode or pulsed infrared sender unit (1) which is mounted inside a window. The signal from the detector (1) is fed into a memory circuit (3) where it is stored against a specific date and time as provided by clock (4). A liquid crystal display (5) is also incorporated into the recorder so that the user may subsequently observe the time and date of each of a series of prior security patrols.

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SECURITY RECORDING DEVICE

This invention relates to recording apparatus and more particularly to a device for identifying patrols made by security personnel.

With existing arrangements security personnel are required to leave identifying cards each time they call at a prescribed address. This however has the disadvantage that multiple calls can be faked by personnel leaving several cards at the one visit. While it has been known to counter-act this through the use of key operated or other mechanically activated recording systems such apparatus are expensive and subject to vandalism.

It is an object of this invention to ameliorate the afore-mentioned disadvantages and accordingly a light sensitive time and date recording apparatus is disclosed, said apparatus being adapted for mounting behind a transparent barrier at a selected location to record times and dates of security patrols, said apparatus being activated by a portable torch of the type carried by said security patrol.

The currently prefered form of this invention will now be described with reference to the accompanying block diagram labelled 1 and schematic diagrams labelled 2, 2A, 2B and 2C.

In terms of the accompanying block diagram it may basically comprise a light sensitive diode or pulsed infrared sender unit 1 which is adapted to be mounted inside a window. The signal from the detector 1 is fed into an event logger circuit 2 and thence to a memory circuit 3 where it is stored agaist a specific date and time as provided by clock 4. A liquid crystal display 5 is also incorporated into the recorder so that the user may subsequently observe the date and time for each of a series of prior recorded events ie. security patrols. Although not shown in the accompanying diagram provision may also be made for hard printouts of event times and dates. In order to prevent multiple logging of the same event an inhibiting switch 6 may also fitted. This prevents separate recordal of events less than say one minute apart.

Although the memory circuit 3 is not limited to any specific capacity it is envisaged that an abitity to record and store data for several patrol events per day over a two week period would be sufficient for most applications.

In use the light detector/sender unit 1 (or indeed the complete device if suitably compacted)

Preferred technical specifications are as follows:

Case

Maximum Size:	140 x 90 x 40 mm
Material:	Moulded Black Plastic
Thickness:	1.5 mm
Back Cover:	Black Plastic
Thickness:	1.5 mm
Securing:	Phillips head self tapping countersunk

Front Panel

Aperture for green Event Record LED
Aperture for red Power On LED
Aperture for Event Count light sensitive diode
Fluorescent paint surrounding Event Detector aperture
Adhesive strip 45 x 15 mm, 3 mm from top and bottom

Back Cover

Aperture for a 4 digit x 5 mm, 7 segment display
Keypad

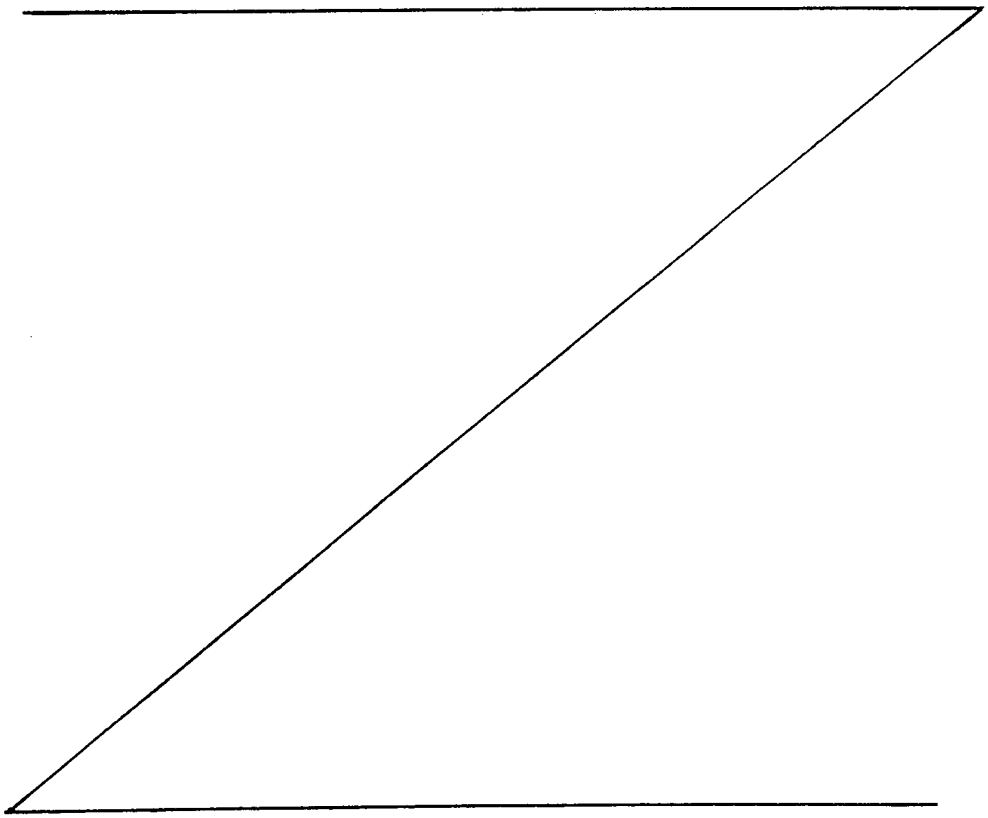
Electronics

Memory:	Record 256 events, with date and time
Clock:	Resetable date and time
	Twenty four hour time
	One hundred year calendar
	Accuracy +- 1 minute per month
Display:	4 digits with separator
LEDs:	Low current 3mm round
	Red for power on
	Green for event record
Light Sensor:	Light sensitive diode
	Not to trigger to ambient light
	Triggered at night by a hand held torch
Keypad:	12 key, 0 - 9, *, #
	Set date
	Set time
	Display current time and date
	Display event time and date
	Scroll through events
Battery:	Life greater than one year for memory only
	Six volt plug in dry cell

would be mounted safely inside a window so as to be secure from vandals.

On the event of each visit security personnel would need only to shine their torch through the window and onto the detector unit to automatically record and store the date and time of the patrol.

At the end of a selected period the client would then be able to confirm that the contracted number of patrols have in fact taken place by simply activating the readout through either the liquid crystal display or printout.



The electronics are mounted on two printed circuit boards, one for the display, mounting LCD1 and U3, and the other for the remaining electronics, mounting U1, U2, U4, U5 and their associated components. The keypad mounts on the back panel.

With the preferred example all processing is carried outby a 68HC11 microprocessor U1 operating from an 8 MHz crystal X1. The 68HC11 is configured for single chip mode, having no external address and data lines. This microprocessor has onboard a 2K X 8 EEPROM which can be written to and read by the microprocessor and is non-volatile, allowing storage of events.

A real time clock is provided by U4, operating from a 32.768 KHz crystal X2. Date and time setting and reading is carried out from the microprocessor via serial lines CLK, SIO and SRST. This RTC is battery backed with battery B1 to give a 10 year clock data retention. During normal operation this battery is trickle charged from the system power line via D1 and R6.

User control is provided by the keypad KP1, the keys strokes of which are detected by the microprocessor via strobe lines KP1 and KP7. Commands are entered at the keypad to instruct the microprocessor to set time and date, display current time and date and to scroll through events. The keypad gives flexibility to provide other control functions at a later date.

A four digit data display is provided by the LCD display LCD1 and its controller chip U3. This chip continually scans each segment of each digit of the LCD, updating its display. Data to be displayed is entered into the controller chip by the microprocessor on lines D1 to D4, whilst DS1 to DS4 are used to set the digit to be updated with this data.

An event detector is provided by light detection diode D3 and its associated amplifier U5. The output of this amplifier is fed to the microprocessor onboard A-D converter via line PS. The microprocessor continually monitors this line, converting the analog signal to an 8 bit digital value. Over a period of time a background light level is established that provides a reference against which a guards torch is compared.

Event and Power indications are provided by LEDs L1 and L2, driven from the microprocessor by lines EV and PO. In case of external power failure when the unit runs from battery these LEDs can be turned off to conserve power.

On power up the system hardware is set to a known state by the reset circuit provided by U2 and the reset switch S1. This unit also contains a watchdog which may be enabled by strapping LK1 pins 2 and 3 or disabled by strapping LK1 pins 1 and 2. When the watchdog is enabled

the processor will provide pulses on line WD to keep the watchdog from timing out and resetting the system.

It will thus be appreciated that this invention at least in the form of the embodiment disclosed provides a novel and unique improvement to existing methods for recording security patrols. Clearly however the example described is only the currently preferred form of this invention and a wide variety of modifications may be made which would be apparent to a person skilled in the art. For example the invention extends to other electrically equivalent types of circuits and is not limited to any particular design of housing for the apparatus. Apparatus may also within the scope of this invention be adapted for use in applications outside the security industry.

The claims defining the invention are as follows:

1. A light sensitive time and date recording and display apparatus for mounting ———————— behind a transparent barrier at a selected location to record times and dates of security patrol events, said apparatus being operational by a portable torch of the type carried by security personnel.

2. The apparatus as claimed in claim 1 wherein the event detector of said apparatus comprises a light detection diode and associated amplifier, the output thereof being fed to a microprocessor having an onboard EEPROM allowing storage of events against a specific date and time provided by a real time clock.

3. The apparatus as claimed in claim 2 wherein the times and dates of said events may be displayed by means of a liquid crystal display and controller chip the data to be displayed being entered into the controller chip by said microprocessor

4. The apparatus as claimed in claim 3 wherein user control is provided by a keypad whereby commands may be entered at said keyboard to instruct the microprocessor to set a time and date, display current time and date and to scroll through events.

5. The apparatus as claimed in claim 4 wherein said controller chip continually scans each segment of each display digit and updates said display.

6. A light sensitive time and date recording and display apparatus, said apparatus being substantially as described herein with reference to the diagrams.

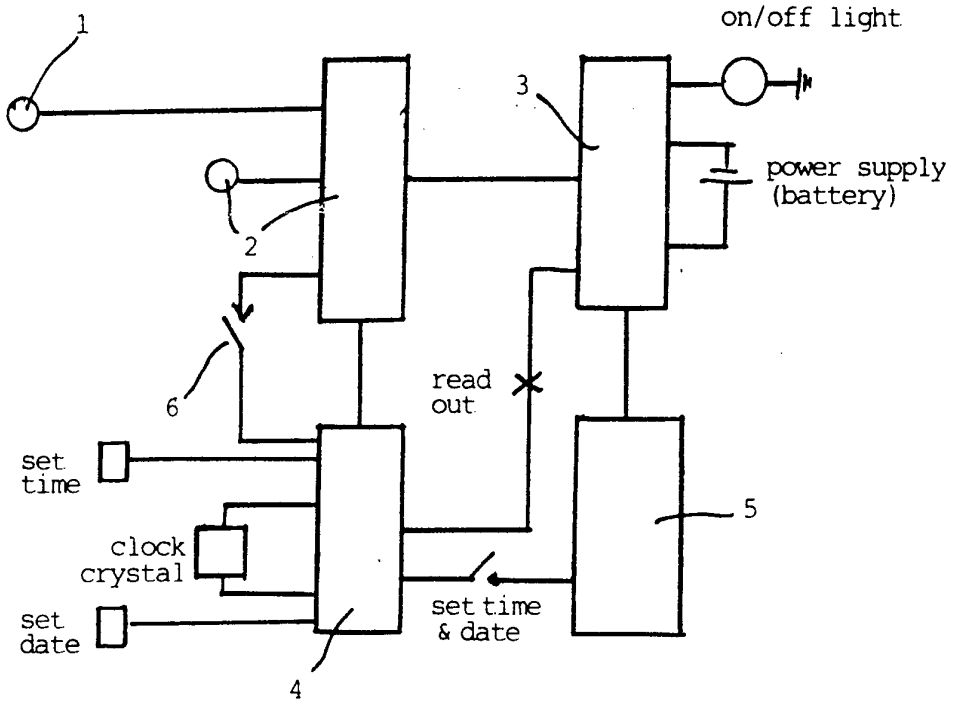

1
on/off light
3
power supply
(battery)
2
6
read
out
set
time
clock
crystal
set
date
4
5
set time
& date

FIGURE 1

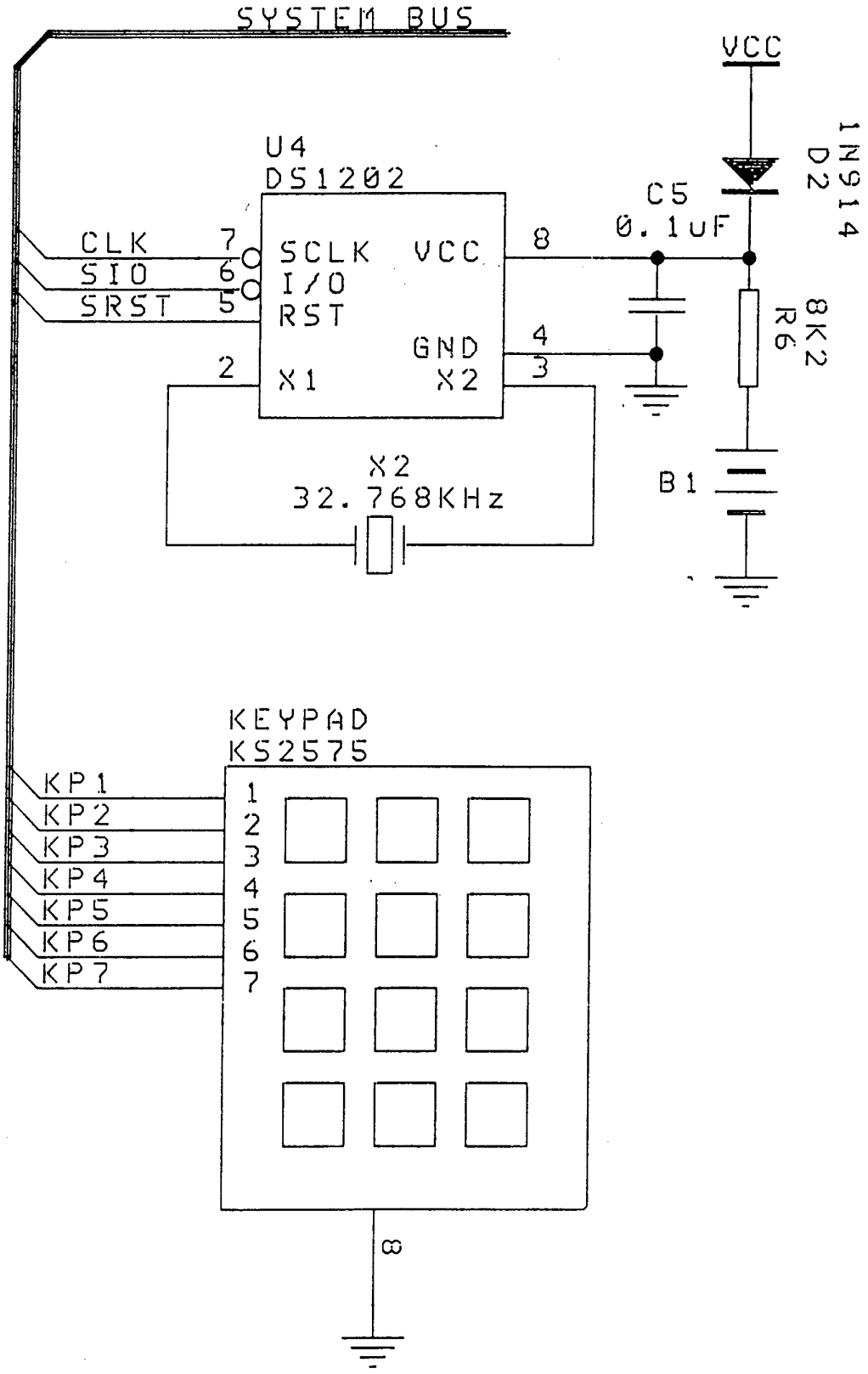

SYSTEM BUS
VCC
1N914
D2
U4
DS1202
C5
0.1uF
CLK
SIO
SRST
7
6
5
SCLK
I/O
RST
VCC
GND
X1
X2
8
4
3
2
8K2
R6
B1
X2
32.768KHz
KEYPAD
KS2575
KP1
KP2
KP3
KP4
KP5
KP6
KP7
1
2
3
4
5
6
7
8

FIGURE 2

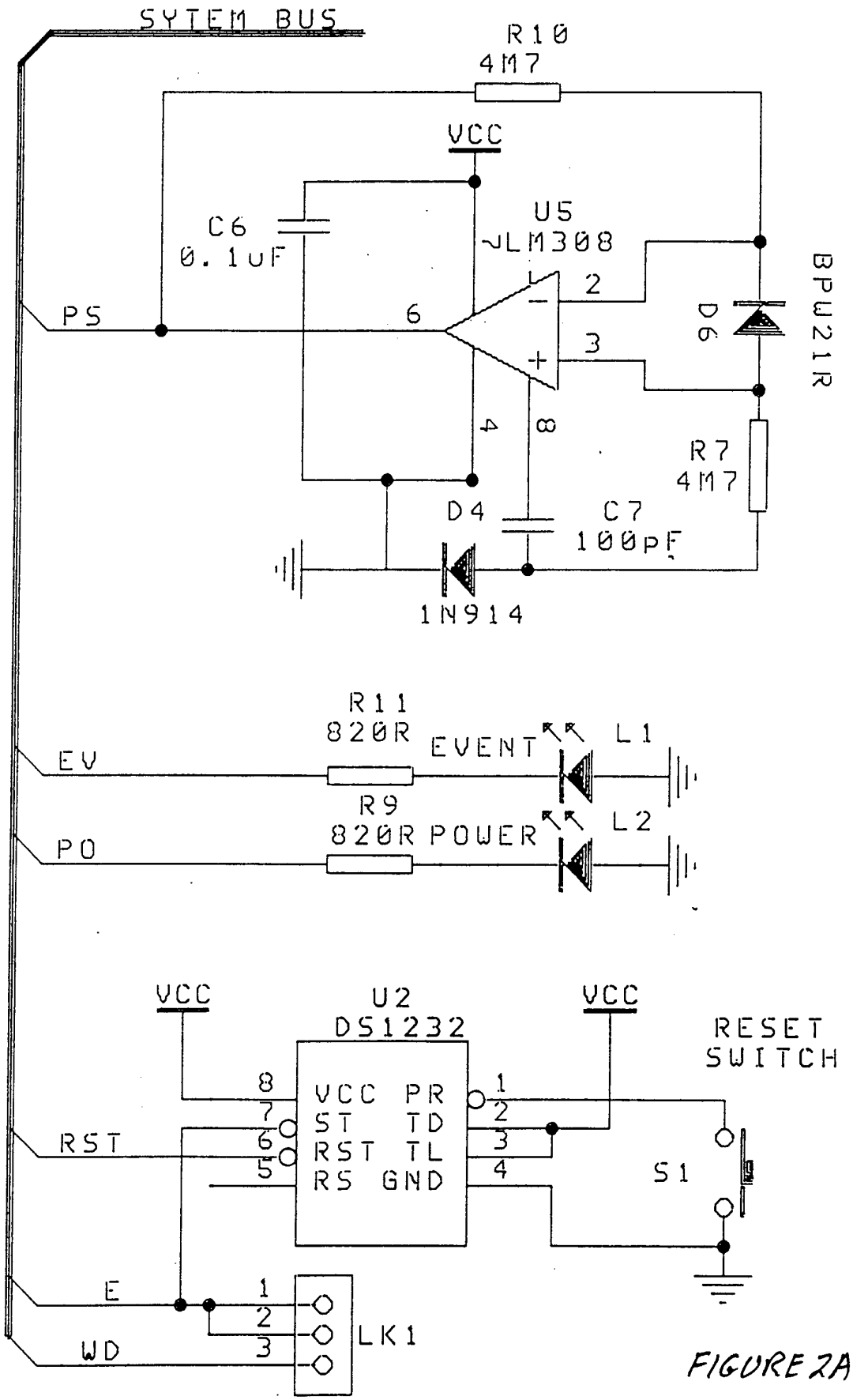

SYTEM BUS
R10
4M7
VCC
C6
0.1uF
U5
LM308
PS
6
2
3
4
8
D6
BPW21R
R7
4M7
D4
C7
100pF
1N914
R11
820R
EVENT
L1
EV
R9
820R
POWER
L2
PO
VCC
U2
DS1232
VCC
RESET
SWITCH
8
7
6
5
VCC PR
ST TD
RST TL
RS GND
1
2
3
4
RST
S1
E
WD
1
2
3
LK1

FIGURE 2A

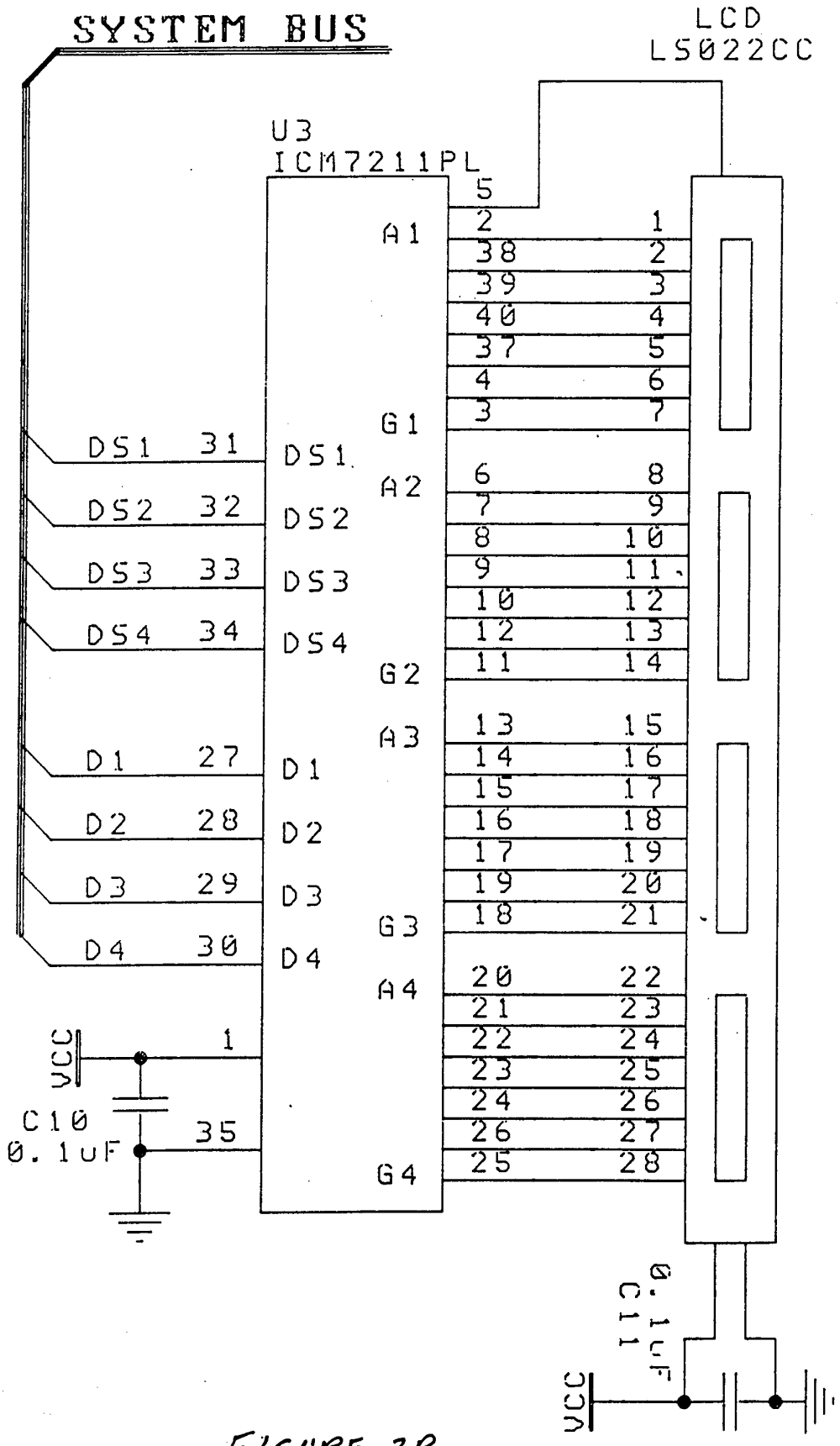

SYSTEM BUS
LCD
LS022CC
U3
ICM7211PL
DS1 31
DS2 32
DS3 33
DS4 34
D1 27
D2 28
D3 29
D4 30
VCC
1
C10
0.1uF
35
A1
G1
A2
G2
A3
G3
A4
G4
C11
0.1uF
VCC

FIGURE 2B

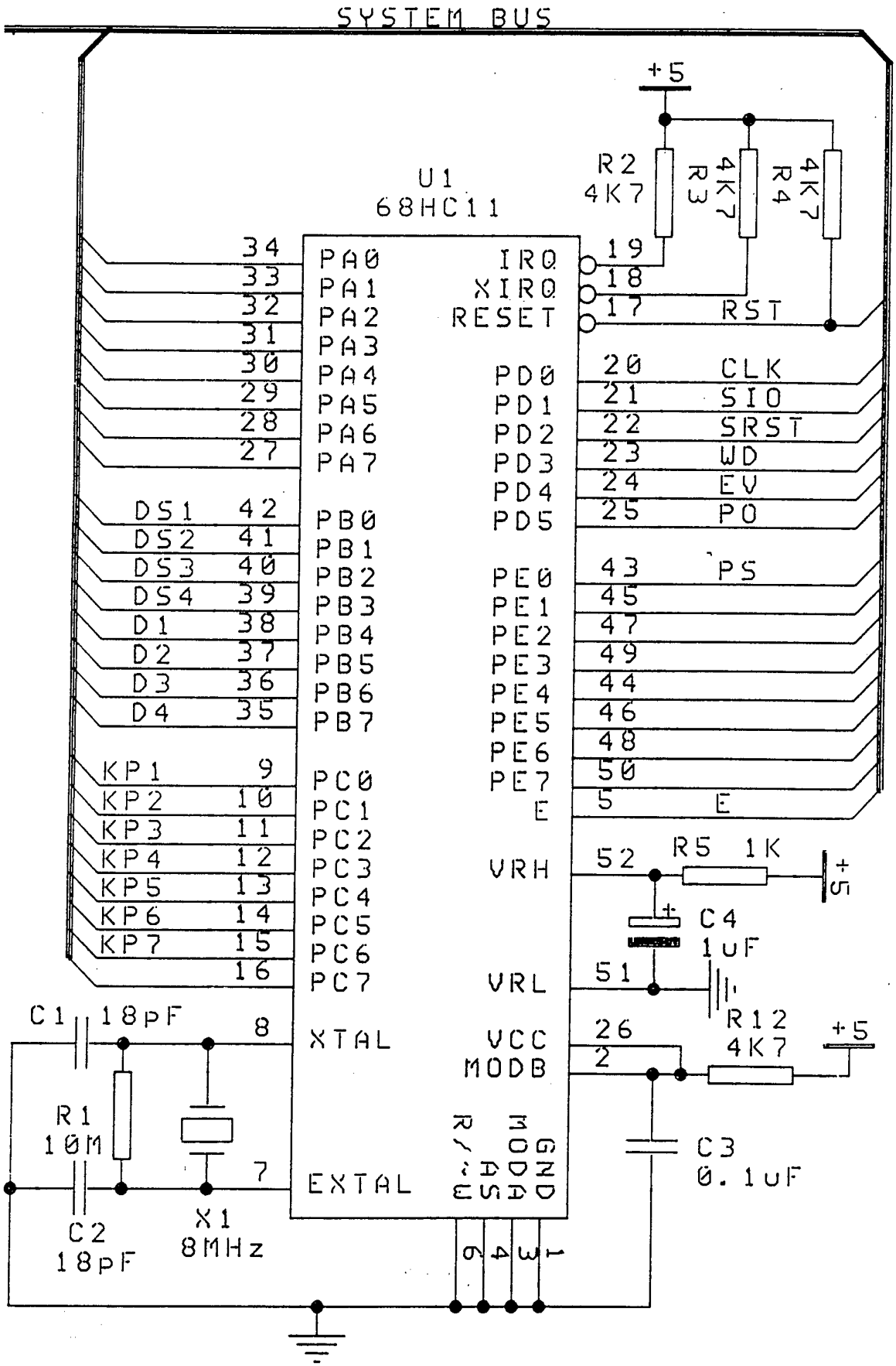

SYSTEM BUS
U1
68HC11
+5
R2
4K7
R3
4K7
R4
4K7
34 PA0
33 PA1
32 PA2
31 PA3
30 PA4
29 PA5
28 PA6
27 PA7
DS1 42 PB0
DS2 41 PB1
DS3 40 PB2
DS4 39 PB3
D1 38 PB4
D2 37 PB5
D3 36 PB6
D4 35 PB7
KP1 9 PC0
KP2 10 PC1
KP3 11 PC2
KP4 12 PC3
KP5 13 PC4
KP6 14 PC5
KP7 15 PC6
16 PC7
8 XTAL
7 EXTAL
IRQ 19
XIRQ 18
RESET 17
RST
PD0 20 CLK
PD1 21 SIO
PD2 22 SRST
PD3 23 WD
PD4 24 EV
PD5 25 PO
PE0 43 PS
PE1 45
PE2 47
PE3 49
PE4 44
PE5 46
PE6 48
PE7 50
E 5 E
VRH 52
VRL 51
VCC 26
MODB 2
R/W 3
MODA 6
AS 4
GND 1
R5 1K
C4
1uF
R12
4K7
C3
0.1uF
C1 18pF
R1
10M
C2
18pF
X1
8MHz

FIGURE 2C

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU92/00516

A. CLASSIFICATION OF SUBJECT MATTER
Int. Cl.[5] G07C 1/20

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)
IPC G07C 1/20

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
AU : IPC 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.
X Y	AU,B, 26480/77 (503010) (BOOTH) 4 January 1979 (04.01.79) Page 3 lines 14-18	1 2
Y	EP,A, 241148 (MOTOROLA GMBH) 14 October 1987 (14.10.87) Page 3, lines 5-20	2

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☐ See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
11 December 1992 (11.12.92)	21 DEC. 1992 (21.12.92)
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