

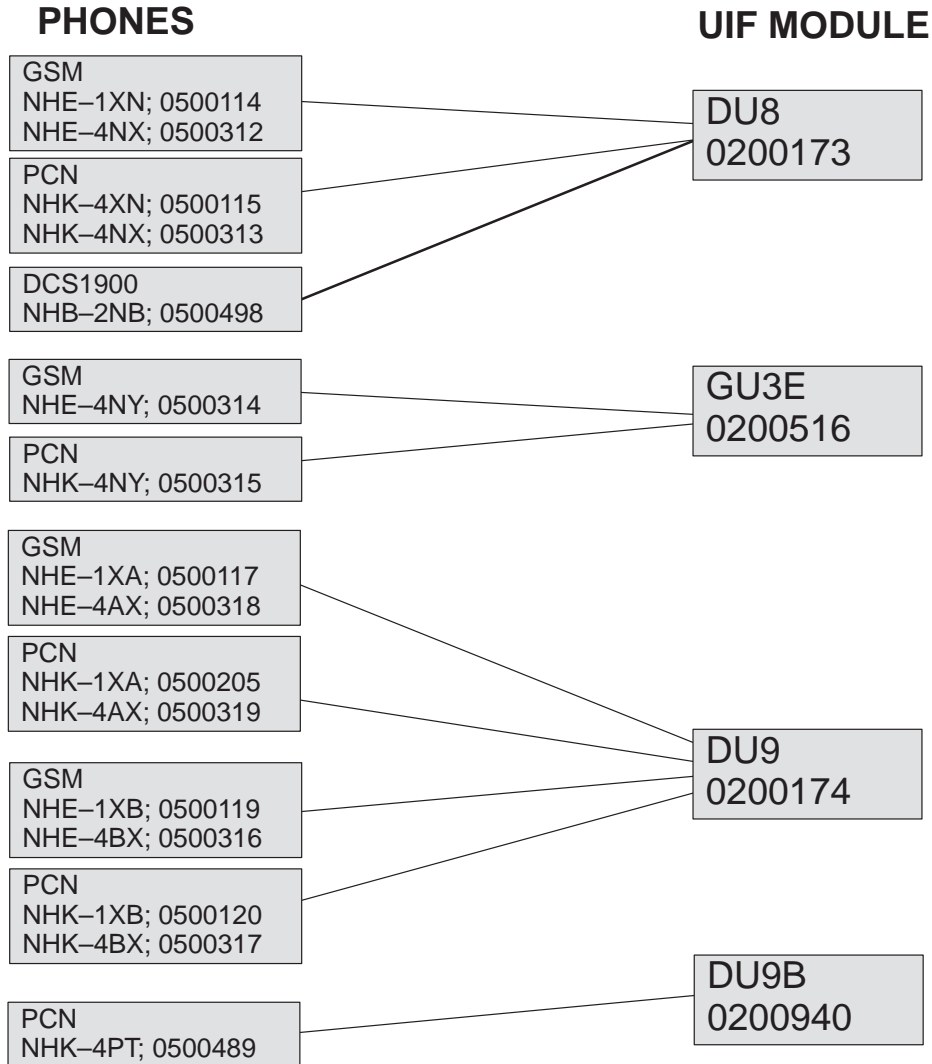
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# UIF Modules DU8, DU9, GU3E

## General

Three modules are described in this document. They are similar in many ways – the only differences being the keyboard layout. The three modules are used in the different GSM , PCN and DCS 1900 phones as shown in following picture:

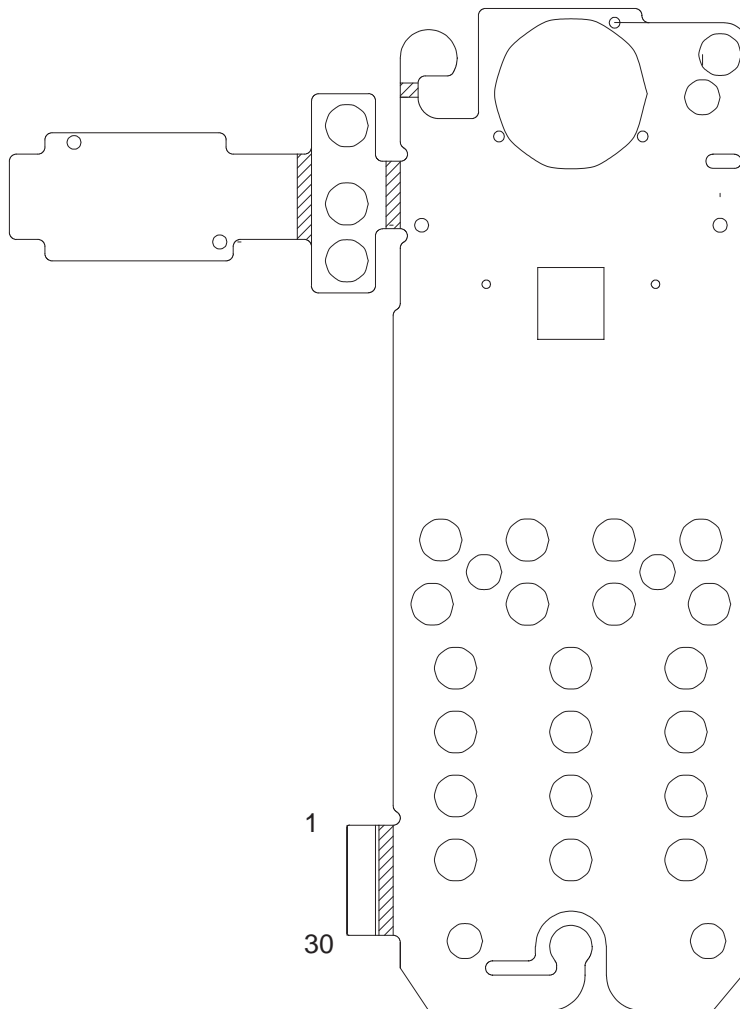


## Hierarchy of Design

The difference between the three PCB layouts is only the position of the keys & LEDs (and one less LED on the DU8 version) The DU8 has 20 main keys, 2 volume keys at the side of the flex and a power key in the upper right corner of the flex. The DU9 has 20 main keys in a slightly different layout and the volume / power keys combined on one assembly.

The GU3E has one LED less than DU8. Volume and power keys are as in DU8.

## Mechanics



DU8, DU9 & GU3E Style Flexes

## Technical Specifications

### External Signals and Connectors

The UIF module has two connectors, display module connector X1 and UIF connector X4.

#### UIF Connector X4

Pin	Name	Description
1	VL1	Logic supply voltage 4.65V
2, 29	GND	Ground
3, 30	VBAT	Battery voltage
4	BACKLIGHT	Backlights on/off
5 – 11	UIF(0:6)	Lines for keyboard read and LCD-controller control
12	MIC_ENA	Microphone bias enable
13 – 16	COL(0:3)	Lines for keyboard write
17	CALL_LED	Call led enable
18	MICP	Microphone (positive node)
19	MICN	Microphone (negative node)
20	EARP	Earpiece (negative node)
21	EARN	Earpiece (positive node)
22	BUZZER	PWM signal buzzer control
23	XPWRON	Power key (active low)
24	VA1	Analog supply voltage 4.65V
25	SIMCLK	Clock for SIM data
26	SIMRESET	Reset for SIM
27	VSIM	SIM voltage supply control
28	SIMDATA	Serial data for SIM

## Supply voltages and power consumption

Symbol	Description	Values
VL1	Logic voltage	
	• typical/nominal	1.5 mA
VA	Analog voltage	
	• mic enabled typ/nom current	250 µA
	• max volume level to earphone typ/nom current	25 mA
Vbatt	Battery voltage	
	• Buzzer with max volume typ/nom current	85 mA
	max current	115 mA
	• display illumination typ/nom current	40 mA
	• keyboard illumination typ/nom current	40 mA

## Control Signals

Symbol	Description	Values
Mic_Enable	Microphone enable	
	• enabled typ/max	0...3 V
	• disabled min/typ/max	VA1-0.4...VA1...VA1+3 V
Key and LCD light	key and LCD backlighting control	
	• Lights on min/max	VA1-1.0...VA1 V
	• Lights off min/max	0...2.0 V
Call_Led	Call indicator LED control	
	• LED on min/max	VA1-1.0...VA1 V
	• LED off min/max	0...0.4 V

## Warnings and Restrictions

**Limited Bending Ability:** The flexible circuits are constructed from a lamination of three layers of polyamide and two layers of copper tracks. The polyamide has almost unlimited bending capability – but the copper tracks cannot be bent to tight radii very often. At all times before the flexi circuit is installed into a phone, bending of the circuit should be avoided if possible. If the flexi circuit has already been installed into the phone, then care should be taken not to continuously fold the flexi circuit out flat and then back to its resting position too often.

## Functional Description

The module is connected with 30 pin flex connector to the system board, 24 pin connector to the LCD module and 6 pin connector to the SIM card.

The module includes following main blocks:

- keyboard
- SIM interface
- illumination
- audio block
- LCD Module interface

### Keyboard Scanning

COL(0–4) are used as column lines in keyboard. UIF(0–5) are used as row lines. They are also multiplexed with display driver control signals.

When a key is pressed the ASIC gets an interrupt from a row and the MCU starts scanning. One column at a time is written to low and rows are used to read which key it was. The power off detection is multiplexed with one row; when all keys on the row seems to be pressed the ASIC knows that power key is pressed. The power key is also connected to PSL+ to switch the power on.

Row lines and UIF6 are used for display driver control. UIF(0–3) are used as 4 bit parallel data bus for the driver. UIF4 is used as read/write strobe, UIF5 to select data or instruction register and UIF6 as enable strobe.

### Keyboard and Display illumination

The keyboard illumination is achieved by using two transistors wired as simple constant current sinks. Each transistor supplies eight leds. The bases of the transistors are all wired together and supplied by emitter follower V40. The led current is fixed by the values of R44 and R45 and the ratio of R51 to R52. The current is about 5 mA/ each LED. Note that on DU9 flexis, the 17<sup>th</sup> led is driven from an additional transistor.

The display illumination operates in a similar way to the keyboard drivers, two transistors are used to drive eight leds. The current in this case is defined by the value of R46, R47 and the ratio of R51 to R52. It is about 10 mA/ each LED.

## Audio Circuitry

The earpiece is routed directly via series resistors to connector X4. The earpiece is dynamic type. The impedance is 32  $\Omega$  and sensitivity 118 dB/1 V.

Microphone is of the electret type and needs a voltage supply for operation. When MIC\_ENA is low bias voltage is connected to the microphone via transistor V8. V2 is wired as a switch for VA1, controlled by the microphone enable line [MICENA]. VA1 is an analogue rail supplied by the PSL+ chip on the system board. It is 4.65 V in magnitude. The sensitivity of the microphone is -62 dB (0 dB = 1V/ $\mu$ bar). C26 and C27 in the MIC nodes act as high pass filter with pulldown resistors on the baseband side. -3 dB point is about 100Hz.

The buzzer is dynamic one and the impedance is 25 ohm. Buzzer is driven from a two transistor switch which acts as a buffer for a CMOS output signal applied at BUZZER. The ringing volume is controlled by pulse width modulation. The diode V37 prevents damage to the transistor when switched off, absorbing the stored energy in the buzzer inductance and suppressing large positive going spikes on the transistor collectors.

Small value capacitors are fitted at critical points in the circuit to avoid problems with rf interference. One is placed directly across the microphone (C15). V9 has a cap to ground from each of its three terminals (C14, C17 and C21). There is also capacitors in earphone nodes.

## LCD Module Interface

The LCD module includes the LCD and the display driver. The driver TAB is connected with heat seal connection to the LCD. The LCD is FSTN type. The duty ratio is 1/32 and the bias ratio 1/6.7. Viewing direction is 6 o'clock. The display driver is NJU6406-02 from JRC. It has internal clock oscillator and negative voltage generator. It has 9600 bit character generator ROM and 64 \* 8 bits character generator RAM. The display module is connected to the UIF module with 24 pin soldered connection.

The display module contains an oscillator to generate a negative voltage required for operation. The oscillator frequency is fixed on the UIF module by the resistance from pins 2 to 3 of X1, with the values of R6 and R16 shown, the frequency is within 180 kHz to 370 kHz. The negative going pulses appear at pin 9 of X1 where they are smoothed by C1 to give a voltage which is nominally equal but opposite to VL1.

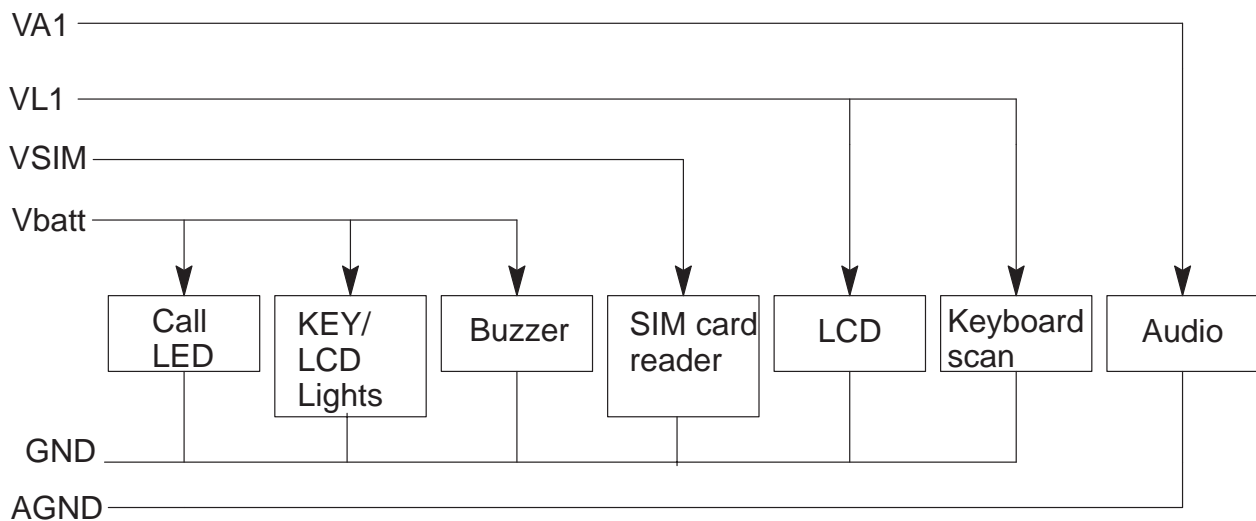
For correct operation of the display, D.C. voltages between -VL1 and VL1 need to be generated and fed back to the driver chip, at pins 4 to 8 inclusive (of X1). The exact voltages depend on the relative values of the resistors R21, R37, R38, R39, R40 and R33.

The display driver is connected to the radio module with a 4 bit data bus. Data transfer is controlled with the following signals: R/W selects read or write operation ("0" = write, "1" = read), Enable activates read/write operations and RS selects the register ("0" : instruction register (writing) or busy flag (reading), "1" : data register).

## SIM Interface

The SIM interface is the electrical interface between the smart card used in the GSM and PCN applications and the MCU via the ASIC. Four signals are used between the SIM card and the ASIC: SIMDATA, SIMCLK, SIMRESET and VSIM. Serial data is transferred between the card and the ASIC, the clock frequency is 3.25 MHz. When there is no data transfer between the SIM card and the HP the clock can be reduced to 1.625 MHz. Some cards allow to stop the clock in that mode. The ASIC also generates the reset for the card and the supply voltage VSIM.

## Power Distribution Diagram







## Circuit Diagram of DU8 (Version 2.7 edit 31)



## Circuit Diagram of DU9 (Version 2.7 edit 36)



## Circuit Diagram of GU3E (Version 1.0 edit 38)



## Layout Diagrams of DU8 (Version 09)



## Layout Diagrams of DU9 (Version 11)



## Layout Diagrams of **GU3E** (Version 06)

**Parts List of DU8** EDMS Issue 1.3

Code 0200173

ITEM	CODE	DESCRIPTION	VALUE	TYPE
R002	1430151	Chip resistor	10	5 % 0.063 W 0603
R003	1430151	Chip resistor	10	5 % 0.063 W 0603
R004	1430075	Chip resistor	33 k	5 % 0.063 W 0603
R005	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R006	1430057	Chip resistor	8.2 k	5 % 0.063 W 0603
R009	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R010	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R011	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R012	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R013	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R014	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R015	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R016	1430085	Chip resistor	82 k	5 % 0.063 W 0603
R017	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R018	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R021	1430075	Chip resistor	33 k	5 % 0.063 W 0603
R022	1430065	Chip resistor	10 k	5 % 0.063 W 0603
R023	1430065	Chip resistor	10 k	5 % 0.063 W 0603
R024	1430065	Chip resistor	10 k	5 % 0.063 W 0603
R025	1430065	Chip resistor	10 k	5 % 0.063 W 0603
R026	1430065	Chip resistor	10 k	5 % 0.063 W 0603
R028	1430075	Chip resistor	33 k	5 % 0.063 W 0603
R029	1430065	Chip resistor	10 k	5 % 0.063 W 0603
R030	1430051	Chip resistor	4.7 k	5 % 0.063 W 0603
R031	1430051	Chip resistor	4.7 k	5 % 0.063 W 0603
R032	1430013	Chip resistor	330	5 % 0.063 W 0603
R033	1430075	Chip resistor	33 k	5 % 0.063 W 0603
R035	1430035	Chip resistor	1.0 k	5 % 0.063 W 0603
R037	1430063	Chip resistor	12 k	5 % 0.063 W 0603
R038	1430063	Chip resistor	12 k	5 % 0.063 W 0603
R039	1430063	Chip resistor	12 k	5 % 0.063 W 0603
R040	1430063	Chip resistor	12 k	5 % 0.063 W 0603
R044	1430165	Chip resistor	39	5 % 0.063 W 0603
R045	1430165	Chip resistor	39	5 % 0.063 W 0603
R046	1430165	Chip resistor	39	5 % 0.063 W 0603
R047	1430165	Chip resistor	39	5 % 0.063 W 0603
R048	1430035	Chip resistor	1.0 k	5 % 0.063 W 0603
R051	1430045	Chip resistor	2.7 k	5 % 0.063 W 0603
R052	1430043	Chip resistor	2.2 k	5 % 0.063 W 0603
R053	1430013	Chip resistor	330	5 % 0.063 W 0603
R054	1430087	Chip resistor	100 k	5 % 0.063 W 0603
C001	2604248	Tantalum cap.	4.7 u	20 % 16 V 6.0x3.2x2.5
C002	2604431	Tantalum cap.	10 u	20 % 16 V 6.0x3.2x2.5

C003	2310784	Ceramic cap.	100 n	10 % 25 V 0805
C004	2604248	Tantalum cap.	4.7 u	20 % 16 V 6.0x3.2x2.5
C005	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C006	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C007	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C008	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C009	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C010	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C013	2604209	Tantalum cap.	1.0 u	20 % 16 V 3.2x1.6x1.6
C014	2320041	Ceramic cap.	18 p	5 % 50 V 0603
C015	2320041	Ceramic cap.	18 p	5 % 50 V 0603
C021	2320041	Ceramic cap.	18 p	5 % 50 V 0603
C023	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C026	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C027	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C030	2320041	Ceramic cap.	18 p	5 % 50 V 0603
C031	2320041	Ceramic cap.	18 p	5 % 50 V 0603
C040	2320107	Ceramic cap.	10 n	5 % 50 V 0603
B001	5140014	Buzzer transducer		90db 25r pc PCB
B002	5140446	Cond. microphone		62+2dB 2.2k PC PCB
B003	5140576	Dynamic receiver		32r 20x2 20x2
V002	4200829	Transistor	BC859C	pnp 30 V 0.1 A SOT23
V003	4200811	Transistor	BC849C	nnp 30 V 0.1 A SOT23
V004	4200836	Transistor	BCX19	nnp 50 V 0.5 A SOT23
V005	4200811	Transistor	BC849C	nnp 30 V 0.1 A SOT23
V008	4200811	Transistor	BC849C	nnp 30 V 0.1 A SOT23
V010	4864384	Led	Red	0603
V011	4864388	Led	Green	0603
V012	4864388	Led	Green	0603
V013	4864388	Led	Green	0603
V014	4864388	Led	Green	0603
V015	4864388	Led	Green	0603
V016	4864388	Led	Green	0603
V017	4864388	Led	Green	0603
V018	4864388	Led	Green	0603
V019	4864388	Led	Green	0603
V020	4864388	Led	Green	0603
V021	4864388	Led	Green	0603
V022	4864388	Led	Green	0603
V023	4864388	Led	Green	0603
V024	4864388	Led	Green	0603
V025	4864388	Led	Green	0603
V026	4864388	Led	Green	0603
V027	4864388	Led	Green	0603
V028	4864388	Led	Green	0603
V029	4864388	Led	Green	0603
V030	4864388	Led	Green	0603
V031	4864388	Led	Green	0603



V032	4864388	Led	Green	0603
V033	4864388	Led	Green	0603
V034	4864388	Led	Green	0603
V036	4111824	Diode	BAS16	75 V 250 mA 6 ns SOT23
V037	4111824	Diode	BAS16	75 V 250 mA 6 ns SOT23
V040	4200811	Transistor	BC849C	npn 30 V 0.1 A SOT23
V041	4200836	Transistor	BCX19	npn 50 V 0.5 A SOT23
V042	4200836	Transistor	BCX19	npn 50 V 0.5 A SOT23
V043	4200836	Transistor	BCX19	npn 50 V 0.5 A SOT23
V044	4200836	Transistor	BCX19	npn 50 V 0.5 A SOT23
X002	5408804	Sim card reader	ccm03-2-1	6polsmid 6POLSMID
	4850038	IC, lcd 42dotm 3x7sgm 57ind DSL-12		EU
	7310007	Esd tape		dmd00741
	9460074	Light guide		4c23228 nhj-1DA
	9460075	Microphone rubber		4d22908 nhj-1DNHJ-1DA
	9480061	Reflector		3c22893 nhj-1DA
	9480078	Buzzer gasket		4D23092 NHK-1XA
	9480103	Speaker pad2		4D23517 NHK-1XA
	9480134	Speaker gasket		4D24016 NHK-1XA
	9795021	Main keydome		3C26395 NHC-4NX
	9795022	Side keydome		4C26397 NHC-4NX
	9855011	FLEXIBLE DU8		140X50X0.3 2D22779
	9855011	Flexible du8 140x50x0.3		2D22779

**Parts List of DU9** EDMS Issue 1.2 Code 0200174

ITEM	CODE	DESCRIPTION	VALUE	TYPE
R002	1430151	Chip resistor	10	5 % 0.063 W 0603
R003	1430151	Chip resistor	10	5 % 0.063 W 0603
R004	1430075	Chip resistor	33 k	5 % 0.063 W 0603
R005	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R006	1430057	Chip resistor	8.2 k	5 % 0.063 W 0603
R009	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R010	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R011	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R012	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R013	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R014	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R015	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R016	1430085	Chip resistor	82 k	5 % 0.063 W 0603
R017	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R018	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R021	1430075	Chip resistor	33 k	5 % 0.063 W 0603
R022	1430065	Chip resistor	10 k	5 % 0.063 W 0603
R023	1430065	Chip resistor	10 k	5 % 0.063 W 0603
R024	1430065	Chip resistor	10 k	5 % 0.063 W 0603
R025	1430065	Chip resistor	10 k	5 % 0.063 W 0603
R026	1430065	Chip resistor	10 k	5 % 0.063 W 0603
R028	1430075	Chip resistor	33 k	5 % 0.063 W 0603
R029	1430065	Chip resistor	10 k	5 % 0.063 W 0603
R030	1430051	Chip resistor	4.7 k	5 % 0.063 W 0603
R031	1430051	Chip resistor	4.7 k	5 % 0.063 W 0603
R032	1430013	Chip resistor	330	5 % 0.063 W 0603
R033	1430075	Chip resistor	33 k	5 % 0.063 W 0603
R035	1430035	Chip resistor	1.0 k	5 % 0.063 W 0603
R037	1430063	Chip resistor	12 k	5 % 0.063 W 0603
R038	1430063	Chip resistor	12 k	5 % 0.063 W 0603
R039	1430063	Chip resistor	12 k	5 % 0.063 W 0603
R040	1430063	Chip resistor	12 k	5 % 0.063 W 0603
R044	1430165	Chip resistor	39	5 % 0.063 W 0603
R045	1430165	Chip resistor	39	5 % 0.063 W 0603
R046	1430165	Chip resistor	39	5 % 0.063 W 0603
R047	1430165	Chip resistor	39	5 % 0.063 W 0603
R048	1430035	Chip resistor	1.0 k	5 % 0.063 W 0603
R051	1430045	Chip resistor	2.7 k	5 % 0.063 W 0603
R052	1430043	Chip resistor	2.2 k	5 % 0.063 W 0603
R053	1430013	Chip resistor	330	5 % 0.063 W 0603
R054	1430009	Chip resistor	220	5 % 0.063 W 0603
C001	2604248	Tantalum cap.	4.7 u	20 % 16 V 6.0x3.2x2.5
C002	2604431	Tantalum cap.	10 u	20 % 16 V 6.0x3.2x2.5

C003	2310784	Ceramic cap.	100 n	10 % 25 V 0805
C004	2604248	Tantalum cap.	4.7 u	20 % 16 V 6.0x3.2x2.5
C005	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C006	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C007	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C008	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C009	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C010	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C013	2604209	Tantalum cap.	1.0 u	20 % 16 V 3.2x1.6x1.6
C014	2320041	Ceramic cap.	18 p	5 % 50 V 0603
C015	2320041	Ceramic cap.	18 p	5 % 50 V 0603
C021	2320041	Ceramic cap.	18 p	5 % 50 V 0603
C023	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C026	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C027	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C030	2320041	Ceramic cap.	18 p	5 % 50 V 0603
C031	2320041	Ceramic cap.	18 p	5 % 50 V 0603
C040	2320107	Ceramic cap.	10 n	5 % 50 V 0603
B001	5140014	Buzzer transducer		90db 25r pc PCB
B002	5140446	Cond. microphone		62+—2DB 2.2K PCPCB
B003	5140576	Dynamic receiver		32r 20x2 20x2
V002	4200829	Transistor	BC859C	pnnp 30 V 0.1 A SOT23
V003	4200811	Transistor	BC849C	npn 30 V 0.1 A SOT23
V004	4200836	Transistor	BCX19	npn 50 V 0.5 A SOT23
V005	4200811	Transistor	BC849C	npn 30 V 0.1 A SOT23
V008	4200811	Transistor	BC849C	npn 30 V 0.1 A SOT23
V010	4864384	Led	Red	0603
V011	4864388	Led	Green	0603
V012	4864388	Led	Green	0603
V013	4864388	Led	Green	0603
V014	4864388	Led	Green	0603
V015	4864388	Led	Green	0603
V016	4864388	Led	Green	0603
V017	4864388	Led	Green	0603
V018	4864388	Led	Green	0603
V019	4864388	Led	Green	0603
V020	4864388	Led	Green	0603
V021	4864388	Led	Green	0603
V022	4864388	Led	Green	0603
V023	4864388	Led	Green	0603
V024	4864388	Led	Green	0603
V025	4864388	Led	Green	0603
V026	4864388	Led	Green	0603
V027	4864388	Led	Green	0603
V028	4864388	Led	Green	0603
V029	4864388	Led	Green	0603
V030	4864388	Led	Green	0603
V031	4864388	Led	Green	0603

V032	4864388	Led	Green	0603
V033	4864388	Led	Green	0603
V034	4864388	Led	Green	0603
V036	4111824	Diode	BAS16	75 V 250 mA 6 ns SOT23
V037	4111824	Diode	BAS16	75 V 250 mA 6 ns SOT23
V038	4864388	Led	Green	0603
V040	4200811	Transistor	BC849C	nnp 30 V 0.1 A SOT23
V041	4200836	Transistor	BCX19	nnp 50 V 0.5 A SOT23
V042	4200836	Transistor	BCX19	nnp 50 V 0.5 A SOT23
V043	4200836	Transistor	BCX19	nnp 50 V 0.5 A SOT23
V044	4200836	Transistor	BCX19	nnp 50 V 0.5 A SOT23
X002	5408804	Sim card reader ccm03-2-1 6polsmd		6POLSM D
	4850038	IC, lcd 42dotm 3x7sgm 57ind DSL-12		EU
	7310007	Esd tape		dmd00741
	9460074	Light guide		4c23228 nhj-1DA
	9460075	Microphone rubber		4d22908 nhj-1DNHJ-1DA
	9480061	Reflector		3c22893 nhj-1DA
	9480078	Buzzer gasket		4D23092 NHK-1XA
	9480103	Speaker pad2		4D23517 NHK-1XA
	9480134	Speaker gasket		4D24016 NHK-1XA
	9795003	Keydome film		4c22987 nhj-1DA
	9855006	FLEXIBLE DU9 140X500.3		3D22779
	9855006	Flexible du9 140x500.3		3D22779

**Parts List of GU3E** EDMS Issue 1.3 Code 0200516

ITEM	CODE	DESCRIPTION	VALUE	TYPE
R002	1430151	Chip resistor	10	5 % 0.063 W 0603
R003	1430151	Chip resistor	10	5 % 0.063 W 0603
R004	1430075	Chip resistor	33 k	5 % 0.063 W 0603
R005	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R006	1430057	Chip resistor	8.2 k	5 % 0.063 W 0603
R009	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R010	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R011	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R012	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R013	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R014	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R015	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R016	1430085	Chip resistor	82 k	5 % 0.063 W 0603
R017	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R018	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R021	1430075	Chip resistor	33 k	5 % 0.063 W 0603
R022	1430065	Chip resistor	10 k	5 % 0.063 W 0603
R023	1430065	Chip resistor	10 k	5 % 0.063 W 0603
R024	1430065	Chip resistor	10 k	5 % 0.063 W 0603
R025	1430065	Chip resistor	10 k	5 % 0.063 W 0603
R026	1430065	Chip resistor	10 k	5 % 0.063 W 0603
R028	1430075	Chip resistor	33 k	5 % 0.063 W 0603
R029	1430065	Chip resistor	10 k	5 % 0.063 W 0603
R030	1430051	Chip resistor	4.7 k	5 % 0.063 W 0603
R031	1430051	Chip resistor	4.7 k	5 % 0.063 W 0603
R032	1430013	Chip resistor	330	5 % 0.063 W 0603
R033	1430075	Chip resistor	33 k	5 % 0.063 W 0603
R035	1430035	Chip resistor	1.0 k	5 % 0.063 W 0603
R037	1430063	Chip resistor	12 k	5 % 0.063 W 0603
R038	1430063	Chip resistor	12 k	5 % 0.063 W 0603
R039	1430063	Chip resistor	12 k	5 % 0.063 W 0603
R040	1430063	Chip resistor	12 k	5 % 0.063 W 0603
R044	1430165	Chip resistor	39	5 % 0.063 W 0603
R045	1430165	Chip resistor	39	5 % 0.063 W 0603
R046	1430165	Chip resistor	39	5 % 0.063 W 0603
R047	1430165	Chip resistor	39	5 % 0.063 W 0603
R048	1430035	Chip resistor	1.0 k	5 % 0.063 W 0603
R051	1430045	Chip resistor	2.7 k	5 % 0.063 W 0603
R052	1430043	Chip resistor	2.2 k	5 % 0.063 W 0603
R053	1430013	Chip resistor	330	5 % 0.063 W 0603
R054	1430087	Chip resistor	100 k	5 % 0.063 W 0603
R099	1430011	Chip resistor	270	5 % 0.063 W 0603
C001	2604248	Tantalum cap.	4.7 u	20 % 16 V 6.0x3.2x2.5



C002	2604431	Tantalum cap.	10 u	20 % 16 V 6.0x3.2x2.5
C003	2310784	Ceramic cap.	100 n	10 % 25 V 0805
C004	2604248	Tantalum cap.	4.7 u	20 % 16 V 6.0x3.2x2.5
C005	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C006	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C007	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C008	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C009	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C010	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C013	2604209	Tantalum cap.	1.0 u	20 % 16 V 3.2x1.6x1.6
C014	2320041	Ceramic cap.	18 p	5 % 50 V 0603
C015	2320041	Ceramic cap.	18 p	5 % 50 V 0603
C017	2320041	Ceramic cap.	18 p	5 % 50 V 0603
C021	2320041	Ceramic cap.	18 p	5 % 50 V 0603
C023	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C026	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C027	2307816	Ceramic cap.	47 n	20 % 25 V 0805
C030	2320041	Ceramic cap.	18 p	5 % 50 V 0603
C031	2320041	Ceramic cap.	18 p	5 % 50 V 0603
C040	2320107	Ceramic cap.	10 n	5 % 50 V 0603
B001	5140014	Buzzer transducer		90db 25r pc PCB
B002	5140446	Cond. microphone		62+–2dB 2.2K PCPCB
B003	5140576	Dynamic receiver		32r 20x2 20x2
V002	4200829	Transistor	BC859C	pnp 30 V 0.1 A SOT23
V003	4200811	Transistor	BC849C	nnp 30 V 0.1 A SOT23
V004	4200836	Transistor	BCX19	nnp 50 V 0.5 A SOT23
V005	4200811	Transistor	BC849C	nnp 30 V 0.1 A SOT23
V008	4200811	Transistor	BC849C	nnp 30 V 0.1 A SOT23
V010	4864394	Led	Red	1210
V011	4864388	Led	Green	0603
V012	4864388	Led	Green	0603
V013	4864388	Led	Green	0603
V014	4864388	Led	Green	0603
V015	4864388	Led	Green	0603
V016	4864388	Led	Green	0603
V017	4864388	Led	Green	0603
V018	4864388	Led	Green	0603
V019	4864388	Led	Green	0603
V020	4864388	Led	Green	0603
V021	4864388	Led	Green	0603
V022	4864388	Led	Green	0603
V024	4864388	Led	Green	0603
V026	4864388	Led	Green	0603
V027	4864388	Led	Green	0603
V028	4864388	Led	Green	0603
V029	4864388	Led	Green	0603
V030	4864388	Led	Green	0603
V031	4864388	Led	Green	0603

V032	4864388	Led	Green	0603
V033	4864388	Led	Green	0603
V034	4864388	Led	Green	0603
V036	4111824	Diode	BAS16	75 V 250 mA 6 ns SOT23
V037	4111824	Diode	BAS16	75 V 250 mA 6 ns SOT23
V038	4864388	Led	Green	0603
V040	4200811	Transistor	BC849C	nnp 30 V 0.1 A SOT23
V041	4200836	Transistor	BCX19	nnp 50 V 0.5 A SOT23
V042	4200836	Transistor	BCX19	nnp 50 V 0.5 A SOT23
V043	4200836	Transistor	BCX19	nnp 50 V 0.5 A SOT23
V044	4200836	Transistor	BCX19	nnp 50 V 0.5 A SOT23
X002	5408804	Sim card reader ccm03-2-1 6polsmd		6POLSM D
	4850038	IC, lcd 42dotm 3x7sgm 57ind		DSL-12 EU
	7310007	Esd tape		dmd00741
	9460074	Light guide		4c23228 nhj-1DA
	9460075	Microphone rubber		4d22908 nhj-1DNHJ-1DA
	9480061	Reflector		3c22893 nhj-1DA
	9480078	Buzzer gasket		4D23092 NHK-1XA
	9480103	Speaker pad2		4D23517 NHK-1XA
	9480134	Speaker gasket		4D24016 NHK-1XA
	9795004	Keydome pwr		4C23200 NHE-1XN
	9795006	Keydome side		4C23199 NHE-1XN
	9855019	PCB	GU3E	141X104X02 D 2/PA
	9855019	PC board	GU3E	141x104x02 d 2/pa



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