

**MAINTENANCE MANUAL
KEYPAD/DISPLAY PANEL ASSEMBLIES
19D902913G3, G4, G10 (CONVENTIONAL)
19D902913G5, G6 (EDACS)**

TABLE OF CONTENTS

	Page
SPECIFICATIONS	Front Cover
DESCRIPTION	1
CIRCUIT ANALYSIS	1
Keypad	1
LCD Display	1
LED Displays	2
Photo Detector	2
EL Panel Interface	2
Power Distribution	2
TEST PROCEDURES	2
TROUBLESHOOTING	3
IC DATA	4
PARTS LIST	5
OUTLINE AND SCHEMATIC DIAGRAMS:	
System Keypad/ Display Panel	6,8
Scan Keypad/Display Panel	7,9
MECHANICAL LAYOUT DIAGRAMS:	
System Control Unit	10
Scan Control Unit	11

SPECIFICATIONS*

INPUT POWER		
SW A+	(J1-18)	13.8 VDC ±20%
+5V	(J1-1)	5.0 VDC
AC PWR	(J1-20)	125.0 VAC
		400 Hz
MAXIMUM CURRENT DRAIN		
SW A+	(J1-18)	
System	(all LED'S off)	0.5 milliamperes DC
System	(all LED'S on)	160 milliamperes DC
Scan	(all LED'S off)	0.5 milliamperes DC
Scan	(all LED'S on)	50 milliamperes DC
+5V	(J1-1)	10 milliamperes DC
AC-PWR	(J1-20)	15 milliamperes AC
TEMPERATURE RANGE		-30°C (-22°F) to +70°C (+128°F)
LOGIC LEVELS		
High	(1)	4.0 ±1 VDC
Low	(0)	0.5 ±0.5 VDC

*These specifications are intended primarily for use by service personnel. Refer to the appropriate Specification Sheet for complete specifications.

DESCRIPTION

CONVENTIONAL

Keypad/Display panel assemblies 19D902913G3 (system, w/siren), 19D902913G4 (Scan) and 19D902913G10 (System, w/o siren) provide operator interface to the S-825 Control Unit and the associated radio in a conventional system.

EDACS

Keypad/Display panel assemblies 19D902913G5 (System) and 19D902913G6 (Scan) provide operator interface to the S-825 EDACS Control Unit and the RANGR EDACS mobile radio in Enhanced Digital Access Communication systems.

The Keypad/Display panels consist of the following components:

- Front surface (Bezel)
- Keypad
- Electroluminescent (EL) panel
- Printed circuit board
- LCD display window

The System Keypad/Display panel contains 25 push-buttons, and the Scan unit contains 15 push-buttons. The display panel is backlit by the EL panel. A photo detector senses the ambient light level to turn off the EL panel in "high light" conditions.

The System Keypad/Display panel also contains 12 push-buttons that have an LED in the upper left corner of the push-button. The Scan panel has four push-buttons that have LEDs in the upper left corner. The LEDs on both control units flash when the function is active.

Both the System and Scan panels contain four LEDs that are located below the LCD. They are:

- **XMIT** = Transmitter indicator
- **BUSY** = Indicates selected channel is busy
- **SCAN** = Indicates that scan feature is enabled
- **S** = Indicates that the displayed channel is in the scan list.

CIRCUIT ANALYSIS

For references to symbol numbers used in the following text, refer to the Outline Diagram, Schematic Diagram or Parts List as listed in the Table of Contents.

KEYPAD

Two parallel-to-serial converters (U3 and U4) sample and read out the key closure information from the keyboard. The converters sample the keypad buttons on a low to high transition of the LCD-D0 line (J1-8) when the LCD-D1 line (J1-9) is high.

The keypad button information is serially shifted out of the converters on a low-to-high transition of LCD-D0 line (J1-8) when the LCD-D1 line (J1-9) is low. The serial output of U4 (pin 3) is shifted to the serial input of U3 (pin 11). The serial output of U3 (pin 3) is read by the microcomputer on the Processor Board.

When a keypad button is depressed, a pair of input lines to the converters are switched to logic ground. The only exception to this, is the PWR button which has only one input line switched to ground. Table 1 shows the key closures and the corresponding grounded inputs to the converters. Table 2 shows the keypad board inputs and outputs.

The PWR push-button is also sensed by converter U3, and is also applied directly to the processor board. Whenever the control unit is powered down (turned off), the PWR button will power up (turn on) the control unit and radio system. If the PWR control unit is on, and the PWR button is pressed, the button is sensed by the Processor board. The control unit is then powered down under control of the microcomputer on the processor board.

LCD DISPLAY

LCD display DS1 is an eight-digit, alphanumeric display capable of showing all of the characters shown in Table 2. Each digit of DS1 consists of an 18 segment display. The digit displayed is controlled by LCD-D0 through LCD-D3. The position of each digit displayed is controlled by LCD-D4, LCD-D5, and the rising/falling edge of LCD-EN. The position of the characters on the LCD display is shown in Table 3.

LCD drivers U1 and U2 generate the necessary triplexed waveforms to the display, DS1. The two drivers accept parallel data from the Processor board (via LCD-D0 through LCD-D5, LCD-A0, and LCD-A1) to generate the timing waveforms, and to encode the alphanumeric digits to the display.

Table 1 - Keypad Closure

Switch Closure	Switch/KP Name	System Function	Scan Function	Converter Input to Logic Ground	
S1	PWR	Y	Y	U3-1	
S2	2nd	Y	Y	U3-5	U3-4
S3	CLR	Y	Y	U3-13	U3-4
S4	EMER	Y	Y	U3-6	U3-4
S5	SYS▲	Y	N	U313	U3-5
S6	SYS▼	Y	Y	U3-6	U3-5
S7	VOL▲	Y	Y	U3-13	U3-7
S8	VOL▼	Y	Y	U3-6	U3-7
S9	GROUP▲	Y	Y	U3-13	U3-6
S10	GROUP▼	Y	Y	U4-1	U4-4
S11	ADD	Y	Y	U4-14	U4-4
S12	SCAN	Y	Y	U4-13	U4-4
S13	DEL	Y	Y	U4-15	U4-4
S14	YELP/1	Y	N	U4-1	U4-5
S15	SL1/4	Y	N	U4-13	U4-5
S16	SL4/7	Y	N	U4-14	U4-5
S17	AUX-1/*	Y	N	U4-15	U4-5
S18	RESET/2	Y	N	U4-1	U4-6
S19	SL2/5	Y	N	U4-13	U4-6
S20	SL5/8	Y	N	U4-14	U4-6
S21	AUX-2/0	Y	N	U4-15	U4-6
S22	WAIL/3	Y	N	U4-1	U4-7
S23	SL3/6	Y	N	U4-13	U4-7
S24	SL6/9	Y	N	U4-14	U4-7
S25	SPC/#	Y	N	U4-15	U4-7
S26	SYS▲	N	Y	U3-15	U3-14
S27	SPC	N	Y	U3-6	U3-14
S5	AUX	N	Y	U3-5	U3-13

Table 2 - LCD 18-Segment Character Encoding

CODE INPUT								DISPLAY OUTPUT	
LCD_								LCD_(05,04)	
03	02	01	00	00	01	10	11		
0	0	0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	0
0	0	1	1	0	0	0	0	0	0
0	1	0	0	0	0	0	0	0	0
0	1	0	1	0	0	0	0	0	0
0	1	1	0	0	0	0	0	0	0
0	1	1	1	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0
1	0	0	1	0	0	0	0	0	0
1	0	1	0	0	0	0	0	0	0
1	0	1	1	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0	0
1	1	0	1	0	0	0	0	0	0
1	1	1	0	0	0	0	0	0	0
1	1	1	1	0	0	0	0	0	0

DATA DECODING
6-BIT ASCII—18 SEGMENT

The triplexed waveforms are generated by three common lines (COM1, COM2, and COM3). They consist of a six-phase periodic waveform, along with segment lines U, V, W, X, Y, and Z. Segment lines U-Z consist of a periodic waveform varying in shape according to the number of LCD segments to be illuminated in a particular segment line column. The six phases of a complete cycle consist of a three-phase portion and the inversion of the three-phase portion.

Temperature compensation of the LCD display and LCD drivers is accomplished by the network consisting of Q17, R59, R60, and R61.

LED DISPLAYS

The LED displays indicate the state of operation of the radio system. There are a total of 16 LEDs (12 push-button and four static) on the system keypad board, and eight LEDs (four push-button and four status) on the Scan Keypad board. The four status LEDs are common to both keypad boards.

The push-button LED's normally light or flash whenever the applicable key is pressed to activate a function. The four status LED's are non-flashing in both control units. These LEDs are **XMIT**, **BUSY**, **SCAN**, and **S**.

Table 3 - LCD Digit Position Encoding

DISPLAY LOCATION							
CODE INPUT				DISPLAY POSITION			
LCD_A1	LCD_A0	LCD_EN					
0	0	↗		1	(U2)		
0	0	↘		8	(U1)		
0	1	↗		2	(U2)		
0	1	↘		7	(U1)		
1	0	↗		3	(U2)		
1	0	↘		6	(U1)		
1	1	↗		4	(U2)		
1	1	↘		5	(U1)		

The 12 push-button LED's for the System control unit are WAIL, YELP, SL1, SL2, SL3, SL4, SL5, SL6, SPKR, AUX1, AUX2, AND SPC.

The four push-button LEDs on the Scan control unit are AUX, SYS ▲, SYS ▼, AND SPC.

LED driver devices U5 and U6 drive the base of transistors Q1 through Q14, Q23 and Q24. The inputs to the drivers are LCD-D0 through LCD-D5, LCD-A0, and LCD-A1. The transistor collectors sink approximately 10 milliamperes of current through the LEDs. Two series current limiting resistors are used in the anode leg of the LED's to set up the 10 milliamperes nominal value.

Transistors Q18, Q19, and associated circuitry supply power to the push-button LED's. Transistors Q20, Q21, and associated circuitry supply power to the four display LED's. LED drivers U5 and U6 enable the LED's to be turned on or off.

Brightness of the LED's is controlled by FLASH and LED-BACKLIGHT which pulse width modulates the power to the LED's. The display board interface and levels are shown in Table 4.

PHOTO DETECTOR

The keypad boards employ a photo detector to measure the ambient light level. This information is used by the controller on the Processor board to automatically turn on or turn off the electroluminescent (EL) panel, and to dim the LED's in low light conditions.

Table 4 - Display Board Interface and Levels

KEYPAD BOARD CONNECTOR PIN J1	SIGNAL NAME	INPUT (I)/ OUTPUT (O)	DIGITAL (D)/ ANALOG (A)	LEVEL (VOLTS)
1	+5V	I	A	5
2	GND	I	A	0
3	PWR-SW	O	A	0, FLOAT
4	LIGHT-SENSOR	O	A	0 - 5
5	KEYBD-DATA	O	D	TTL
6	LCD-A0	I	D	TTL
7	LCD-A1	I	D	TTL
8	LCD-D0	I	D	TTL
9	LED-D1	I	D	TTL
10	LCD-EN	I	D	TTL
11	LCD-D2	I	D	TTL
12	LCD-D3	I	D	TTL
13	LCD-D4	I	D	TTL
14	LCD-D5	I	D	TTL
15	LCD-EN	I	D	TTL
16	FLASH	I	D	TTL
17	LED-BACKLIGHT	I	D	TTL
18	SW A+	I	A	13.8
19	AC-GND	I	A	0
20	AC-PWR	I	A	125
				(AC RMS)

EL PANEL INTERFACE

The EL panel backlight interface occurs via two pads on the keypad board. J1-20 provides the high voltage AC drive to illuminate the electroluminescent panel. J1-19 provides the AC Ground for the electroluminescent panel.

Power for the EL panel is derived from the processor board through a custom matched EL driver device for the particular EL panel used as part of the front panel.

POWER DISTRIBUTION

The power supplies used to power the keypad boards are SW A+ and +5V. SW A+ is the switched battery power of the control unit. This power supply is switched through the action of the PWR button the front panel of the control unit (and keypad board). The switching action occurs on the I/O board of the control unit

through the power on/off circuitry found on the processor board. SW A+ is used to supply power to the LEDs.

TEST PROCEDURES

There are two different tests for the display/keypad assembly. The tests are:

- The Keyboard Self-Test
- MONITOR Keyboard Test

The Keyboard Self-Test can be performed to check the display panel keyboard functions only. No other test equipment is required. The Self-Test procedure is contained in the S-825 Control Unit Maintenance Manual.

The MONITOR Keyboard Test requires the use of a dumb terminal, AND Interface Kit TQ3310. The MONITOR keyboard test provides for:

- Cycling the LEDs
- Cycling a character on the LCD display (either * or 0)
- Photo detector Test
- EL panel blinking
- Sampling of the pushbuttons

Instructions for this test are also contained in the S-825 Control Unit Maintenance Manual.

TRUBLESHOOTING

LCD DISPLAY

The following procedures are suggested in troubleshooting for missing LCD segments (Display 00000000 or *****).

I. Which character is causing the problem?

i.e. character #7

II. If character #7 is causing the problem, then:

A. With a scope, check if a waveform is present at:

- LCD PIN
- 23 (7U)
 - 37 (7U)
 - 24 (7W)
 - 36 (7X)
 - 35 (7Y)
 - 25 (7Z)

If no waveform is present at the pins, then:

B. Check waveform at:

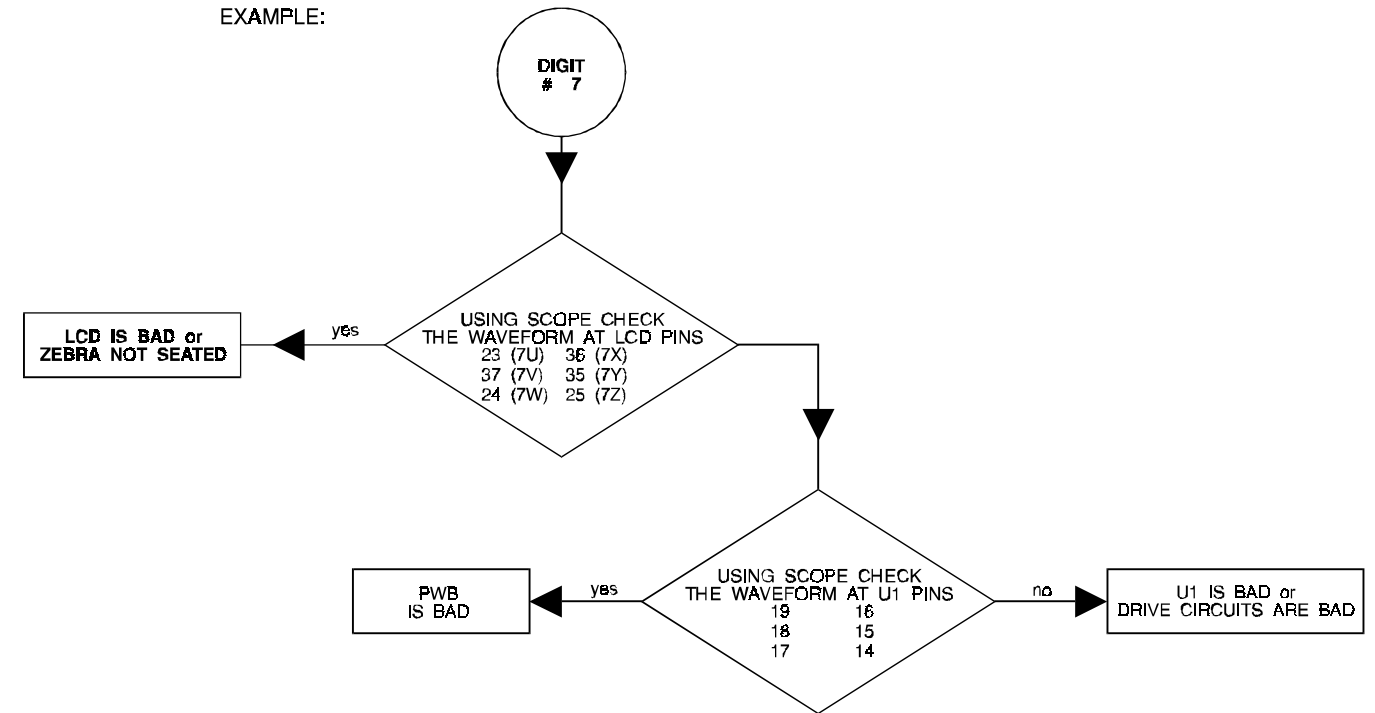
- U1 PIN
- 19
 - 18
 - 17
 - 16
 - 15
 - 14

III. Conclusions:

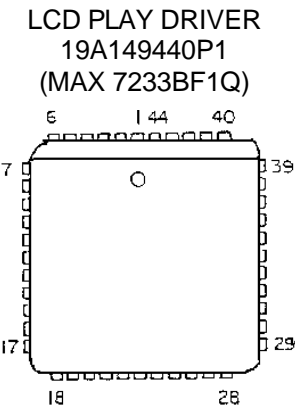
1. If a waveform is present at each pin of the LCD, then the LCD is bad or the Zebra Strips are not seated properly.
2. If a waveform is missing at the LCD but all are present at U1, then the printed wiring board is bad.
3. If a waveform is missing at U1, then U1 or the drive circuits to U1 are bad.

HOW TO TROUBLESHOOT A MISSING LCD SEGMENT (DISPLAY 00000000 OR *****)

EXAMPLE:



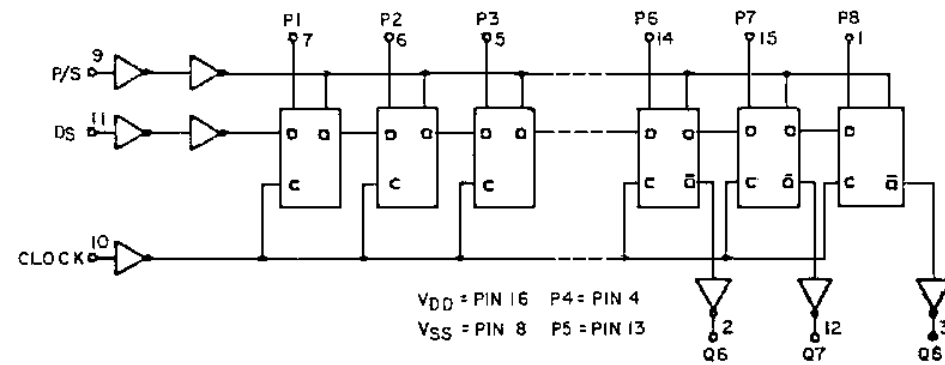
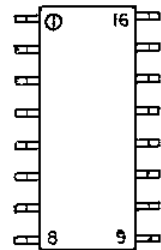
**LCD DRIVER U1 & U2
19A149440P1**



PIN NO.	FUNCTION	PIN NO.	FUNCTION	PIN NO.	FUNCTION	PIN NO.	FUNCTION
1	NC	12	NC	23	NC	34	NC
2	CS ₁	13	1U	24	3W	35	D1
3	VDISP	14	2X	25	3V	36	D2
4	COM 1	15	2Y	26	3U	37	D3
5	COM 2	16	2X	27	4X	38	D4
6	COM 3	17	2W	28	4Y	39	D5
7	IZ	18	2V	29	4X	40	GND
8	IY	19	2U	30	4W	41	AD
9	IX	20	3Z	31	4V	42	A1
10	IW	21	3Y	32	4U	43	CS ₂
11	IY	22	3X	33	DO	44	V+

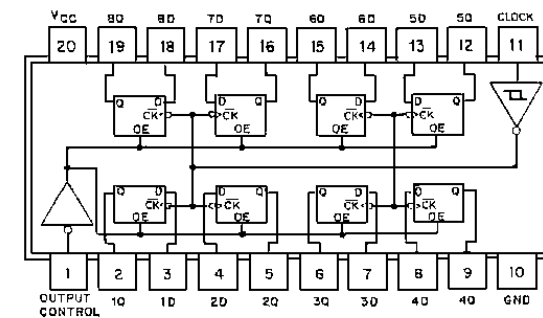
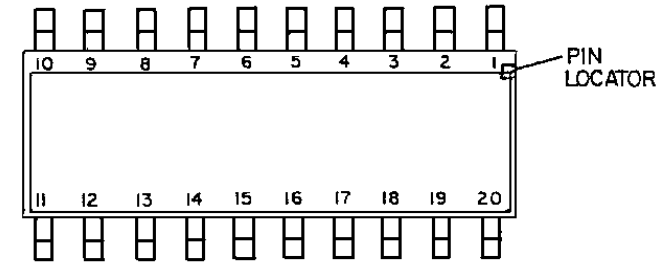
**SHIFT REGISTER U3 & U4
19A149418P1**

**8-BIT STATIC SHIFT REGISTER
19A14918P1
(MC14014B)**



**OCTAL DATA FLIP-FLOP U5 & U6
19A704380P112**

**OCTAL 3 - STATE D FLIP FLOP
19A704380P12, 112, 312 (74HC374)
PIN CONFIGURATION**



TRUTH TABLE

OUTPUT CONTROL	CLOCK	DATA	OUTPUT
L	T	H	H
L	T	L	L
L	L	X	Q ₀
H	X	X	Z

H = HIGH LEVEL, L = LOW LEVEL
X = DON'T CARE
T = TRANSITION FROM LOW-TO-HIGH
Z = HIGH IMPEDANCE STATE
Q₀ = THE LEVEL OF THE OUTPUT BEFORE STEADY STATE INPUT CONDITIONS WERE ESTABLISHED.



KEYPAD/DISPLAY PANEL 19D902913G3, G5, G10 (SYSTEM)
KEYPAD/DISPLAY PANEL 19D902913G4, G6 (SCAN)
ISSUE 1

SYMBOL	GE PART NO.	DESCRIPTION
----- CAPACITORS -----		
C1 thru C13	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
C17 thru C23	19A702052P14	Ceramic: 0.01 uF ±10%, 50 VDCW.
----- DIODES -----		
D81		LCD Display (Reference only).
D82 thru D87		LED, HLMP-6300 Red.
D88		LED, MV54123 Green.
D89		LED, MV57123 Red.
D810 and D811		LED, HLMP-6300 Red.
D812		LED, MV53123 Yellow.
D813 and D814		LED, HLMP-6300 Red.
D815		LED, MV54123 Green.
D816 and D817		LED, HLMP-6300 Red.
----- JACKS -----		
J1		20 Pin Female Connector: Dupont 66951-20.
----- TRANSISTORS -----		
Q1 thru Q18	19A700076P2	Silicon, NPN, 2N3904.
Q19	19A700059P2	Silicon, PNP, 2N3906.
Q20	19A700076P2	Silicon, NPN, 2N3904.
Q21	19A700059P2	Silicon, PNP, 2N3906.
Q22	19A149445P1	Silicon, NPN, Photosensitive.
Q23 and Q24	19A700076P2	Silicon, NPN, 2N3904.
----- RESISTORS -----		
R1 thru R10	19B800607P104	Metal film: 100K ohms ±5%, 1/8 w.
R13 thru R16	19B800607P104	Metal film: 100K ohms ±5%, 1/8 w.
R17	19B800607P471	Metal film: 470 ohms ±5%, 1/8 w.
R18	19B800607P561	Metal film: 560 Ohms ±5%, 1/8 w.
R19	19B800607P471	Metal film: 470 ohms ±5%, 1/8 w.
R20	19B800607P561	Metal film: 560 Ohms ±5%, 1/8 w.
R21	19B800607P471	Metal film: 470 ohms ±5%, 1/8 w.
R22	19B800607P561	Metal film: 560 Ohms ±5%, 1/8 w.
R23	19B800607P471	Metal film: 470 ohms ±5%, 1/8 w.
R24	19B800607P561	Metal film: 560 Ohms ±5%, 1/8 w.
R25	19B800607P471	Metal film: 470 ohms ±5%, 1/8 w.
R26	19B800607P561	Metal film: 560 Ohms ±5%, 1/8 w.
R27	19B800607P471	Metal film: 470 ohms ±5%, 1/8 w.
R28	19B800607P561	Metal film: 560 Ohms ±5%, 1/8 w.

*COMPONENTS ADDED, DELETED OR CHANGED BY PRODUCTION CHANGES

SYMBOL	GE PART NO.	DESCRIPTION
R29	19B800607P471	Metal film: 470 ohms ±5%, 1/8 w.
R30	19B800607P561	Metal film: 560 Ohms ±5%, 1/8 w.
R31	19B800607P471	Metal film: 470 ohms ±5%, 1/8 w.
R32	19B800607P561	Metal film: 560 Ohms ±5%, 1/8 w.
R33	19B800607P471	Metal film: 470 ohms ±5%, 1/8 w.
R34	19B800607P561	Metal film: 560 Ohms ±5%, 1/8 w.
R35	19B800607P471	Metal film: 470 ohms ±5%, 1/8 w.
R36	19B800607P561	Metal film: 560 Ohms ±5%, 1/8 w.
R37	19B800607P471	Metal film: 470 ohms ±5%, 1/8 w.
R38	19B800607P561	Metal film: 560 Ohms ±5%, 1/8 w.
R39	19B800607P471	Metal film: 470 ohms ±5%, 1/8 w.
R40	19B800607P561	Metal film: 560 Ohms ±5%, 1/8 w.
R41	19B800607P471	Metal film: 470 ohms ±5%, 1/8 w.
R42	19B800607P561	Metal film: 560 Ohms ±5%, 1/8 w.
R43	19B800607P471	Metal film: 470 ohms ±5%, 1/8 w.
R44	19B800607P561	Metal film: 560 Ohms ±5%, 1/8 w.
R45 thru R58	19B800607P223	Metal film: 22K ohms ±5%, 1/8 w.
R59	19B800607P104	Metal film: 100K ohms ±5%, 1/8 w.
R60	19B800607P153	Metal film: 15K ohms ±5%, 1/8 w.
R61	19B800607P472	Metal film: 4.7K ohms ±5%, 1/8 w.
R62 and R63	19B800607P223	Metal film: 22K ohms ±5%, 1/8 w.
R64	19B800607P104	Metal film: 100K ohms ±5%, 1/8 w.
R65	19B800607P472	Metal film: 4.7K ohms ±5%, 1/8 w.
R66 thru R70	19B800607P223	Metal film: 22K ohms ±5%, 1/8 w.
R71	19B800607P104	Metal film: 100K ohms ±5%, 1/8 w.
R72	19B800607P102	Metal film: 1K ohms ±5%, 1/8 w.
R73 thru R75	19B800607P223	Metal film: 22K ohms ±5%, 1/8 w.
R76	19B800607P561	Metal film: 560 Ohms ±5%, 1/8 w.
R77	19B800607P471	Metal film: 470 ohms ±5%, 1/8 w.
R78	19B800607P223	Metal film: 22K Ohms ±5%, 1/8 w.
R79	19B800607P561	Metal film: 560 Ohms ±5%, 1/8 w.
R80	19B800607P471	Metal film: 470 ohms ±5%, 1/8 w.
----- INTEGRATED CIRCUITS -----		
U1 and U2	19A149440P1	LCD Driver: sim to MAX7233BFIQH.
U3 and U4	19A149418P1	Digital: CMOS Shift Register; sim to MC14014B.
U5 and U6	19A704380P112	Digital: CMOS Data Flip-Flop; sim to 74HC374.
----- MISCELLANEOUS -----		
3	19C337521W2	Spacer (Q22).
5	19B802023G1	Nameplate.
6	19B801024G1	Bezel, System.
9	19D902884P2	Bezel, Scan.
10	19D902884P2	Keypad, System. (Used in Group 3).
11	19D902884P3	Keypad, Scan. (Used in Group 4).
12	19D902884P3	Keypad, System. (Used in Group 5).
36	19D902884P7	Keypad, Scan. (Used in Group 6).
16	19C337524P1	Keypad, System. (Used in Group 10). LCD Display.

SYMBOL	GE PART NO.	DESCRIPTION
17	19B235594P1	Zebra Strip.
18	19D903365P1	Electroluminescent Panel.
20	19C337525P1	Membrane. (Used in Groups 3, 5, and 10).
21	19C337526P1	Membrane. (Used in Groups 4 and 6).
22	19D902982P1	Component Board (Used in Groups 3, 5 and 10).
23	19D902983P1	Component Board (Used in Groups 4 and 6).
25	19B235595P1	Jewel.
26	4033198P22	Metal Eyelet.
31	19C337560P1	Spacer (LCD Display).
32	19C337561	LCD Shield.
33	19D902906P1	Spacer (LCD Display).

PRODUCTION CHANGES

Changes in the equipment to improve performance or to simplify circuits are identified by a "Revision Letter", which is stamped after the model number of the unit. The revision stamped on the unit includes all previous revisions. Refer to the Parts List for the descriptions of parts affected by these revisions.

REV. A - [SYSTEM KEYPAD/DISPLAY PANEL 19D902913G3](#)
REV. A - [SCAN KEYPAD/DISPLAY PANEL 19D902913G4](#)
REV. A - [SYSTEM KEYPAD/DISPLAY PANEL 19D902913G5](#)
REV. A - [SCAN KEYPAD/DISPLAY PANEL 19D902913G6](#)
To improve LCD display, a supporting rubber bumper 19A701502P3 was added.

REV. B - [SYSTEM KEYPAD/DISPLAY PANEL 19D902913G3](#)
REV. B - [SCAN KEYPAD/DISPLAY PANEL 19D902913G4](#)
REV. B - [SYSTEM KEYPAD/DISPLAY PANEL 19D902913G5](#)
REV. B - [SCAN KEYPAD/DISPLAY PANEL 19D902913G6](#) REV. B - [SYSTEM KEYPAD/DISPLAY PANEL 19D902913G10](#)
To improve assembly, bezel was changed to 19D902888P2 and 19D902889P2 with longer mounting spacers.

Bezel was 19D902888P1 and 19D902889P1.

REV. C - [SYSTEM KEYPAD/DISPLAY PANEL 19D902913G3](#)
REV. C - [SYSTEM KEYPAD/DISPLAY PANEL 19D902913G5](#)
REV. C - [SYSTEM KEYPAD/DISPLAY PANEL 19D902913G10](#)
To improve mechanical stability, bezel material was changed from Xenoy to aluminum. New part is 19D903169P2 (System).

Bezel was 19D902888P2.

REV. D - [SYSTEM KEYPAD/DISPLAY PANEL 19D902913G3](#)
REV. C - [SCAN KEYPAD/DISPLAY PANEL 19D902913G4](#) REV. D - [SYSTEM KEYPAD/DISPLAY PANEL 19D902913G5](#)
REV. C - [SCAN KEYPAD/DISPLAY PANEL 19D902913G6](#)
REV. D - [SYSTEM KEYPAD/DISPLAY PANEL 19D902913G10](#)
To improve Keypad/Display assembly, the plastic LCD lens and frame was changed and two plastic spacers and a metal LCD frame were added. Rubber bumper 19A701502P3 was removed.

Old LCD lens was 19C337523P1.

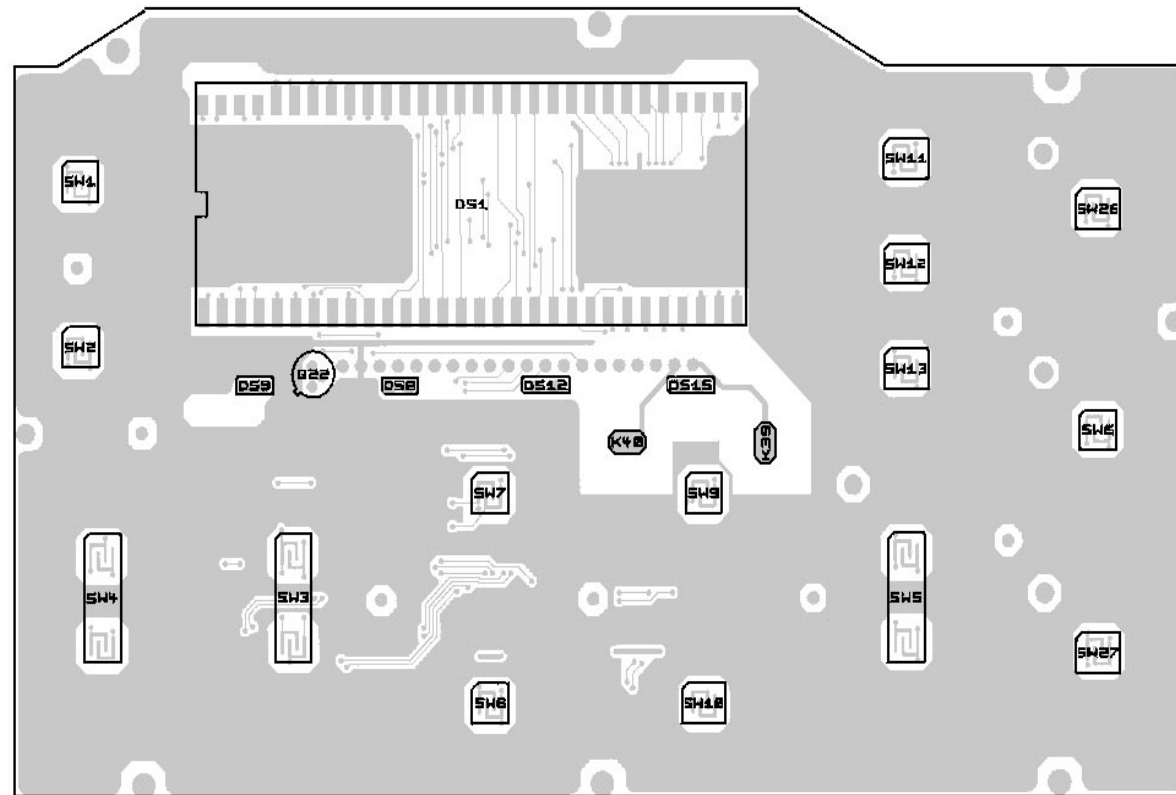
REV. D - [SCAN KEYPAD/DISPLAY PANEL 19D902913G4](#)
REV. D - [SCAN KEYPAD/DISPLAY PANEL 19D902913G6](#)
To improve mechanical stability, bezel material was changed from Xenoy to aluminum. New part is 19D903170P2.

Bezel was 19D902889P2.

REV. E - [SYSTEM KEYPAD/DISPLAY PANEL 19D902913G3](#)
REV. E - [SCAN KEYPAD/DISPLAY PANEL 19D902913G4](#)
REV. E - [SYSTEM KEYPAD/DISPLAY PANEL 19D902913G5](#)
REV. E - [SCAN KEYPAD/DISPLAY PANEL 19D902913G6](#)
REV. E - [SYSTEM KEYPAD/DISPLAY PANEL 19D902913G10](#)
To improve backlighting for the Keypad/Display panel, a new electroluminescent panel 19D903365P1 was added.

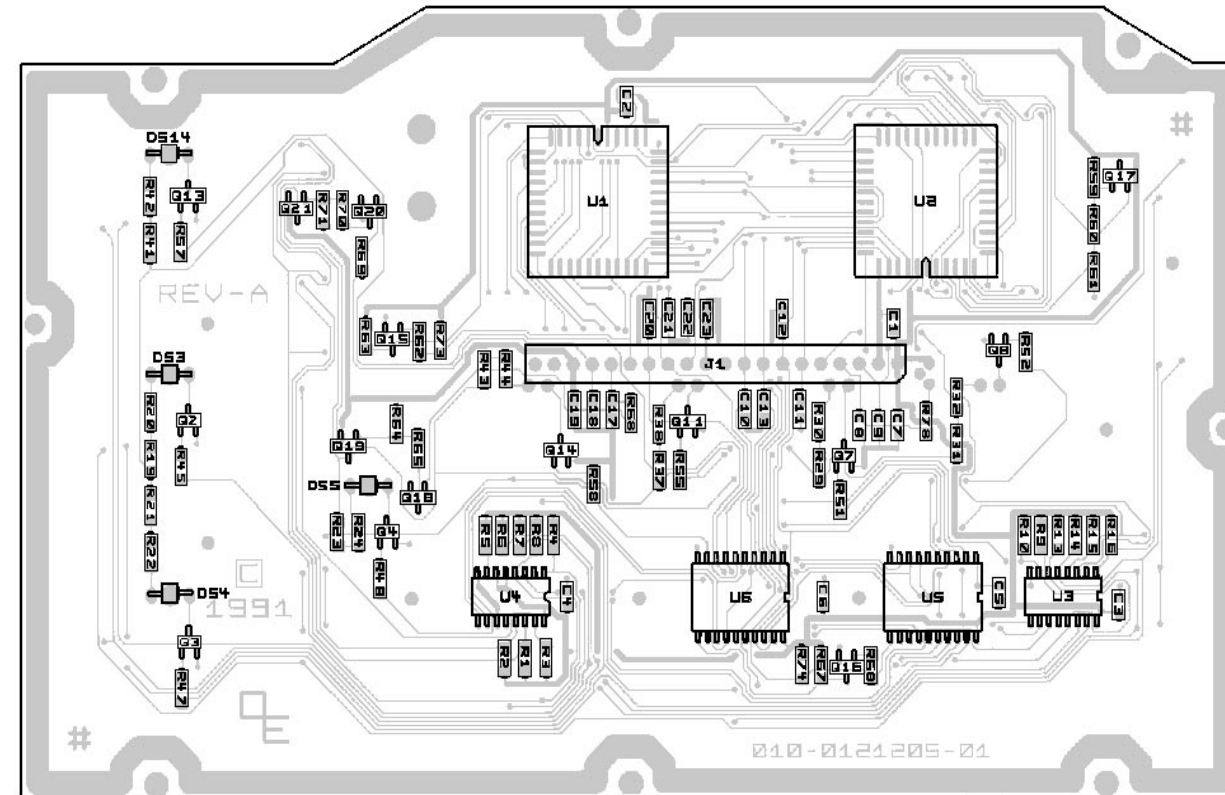
Old EL panel was 19D902886P1 (System) and 19D902887P1 (Scan).

TOP ASSEMBLY



(00121206-01, Sh. 1, Rev. A)
 (010-0121206-01, Sh. 1, Rev. A)
 (010-0121206-01, Sh. 2, Rev. A)

BOTTOM ASSEMBLY



(001-0121206-01, Sh. 1, Rev. A)
 (010-0121206-01, Sh. 2, Rev. A)

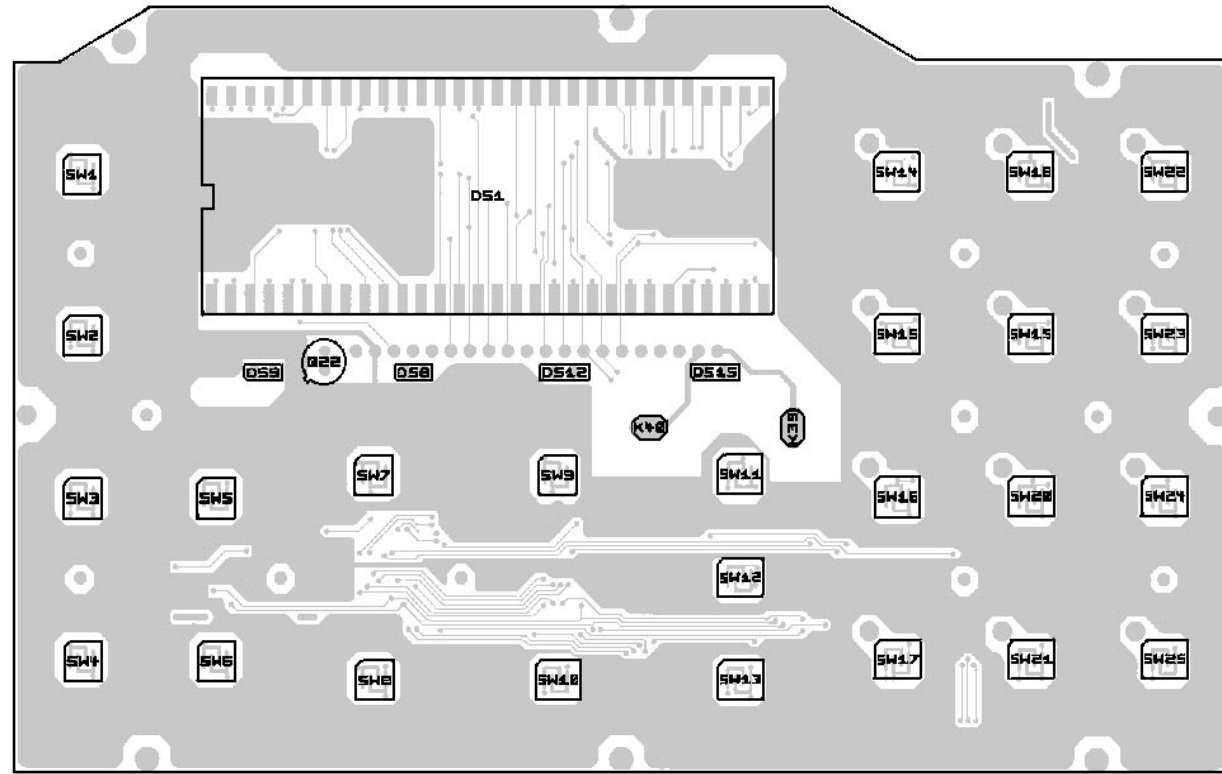


CAUTION
 OBSERVE PRECAUTIONS
 FOR HANDLING
**ELECTROSTATIC
 SENSITIVE
 DEVICES**

SYSTEM KEYPAD/DISPLAY PANEL
 19D902913G3, G5, G10

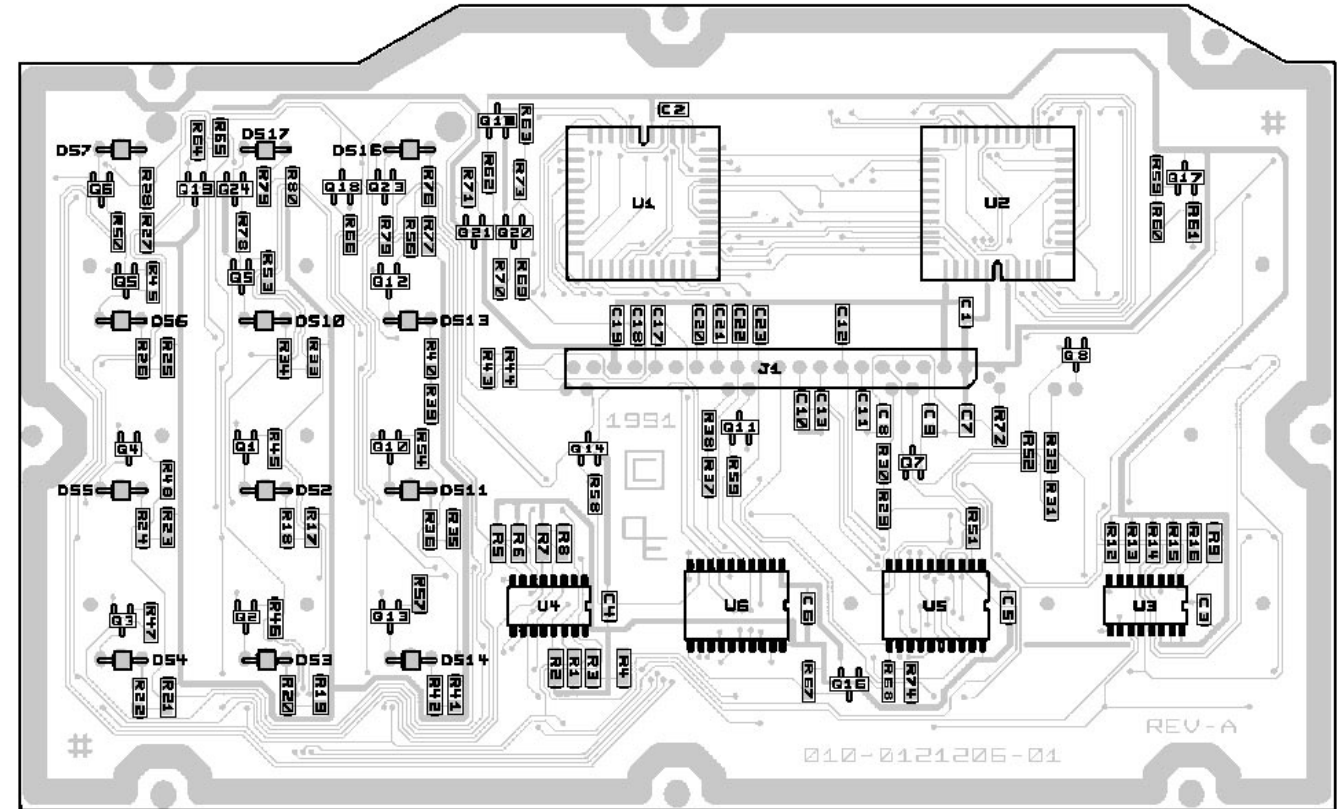
THE FOLLOWING ARE MOS DEVICES REQUIRING
 SPECIAL CARE: U3, U4, U5, U6.

TOP ASSEMBLY



(001-0121205-01, Sh. 1, Rev. A)
(010-0121205-01, Sh. 1, Rev. A)
(010-0121205-Sh. 2, Rev. A)

BOTTOM ASSEMBLY



(001-0121205-01, Sh. 2, Rev. A)
(010-0121205-01, Sh. 2, Rev. A)



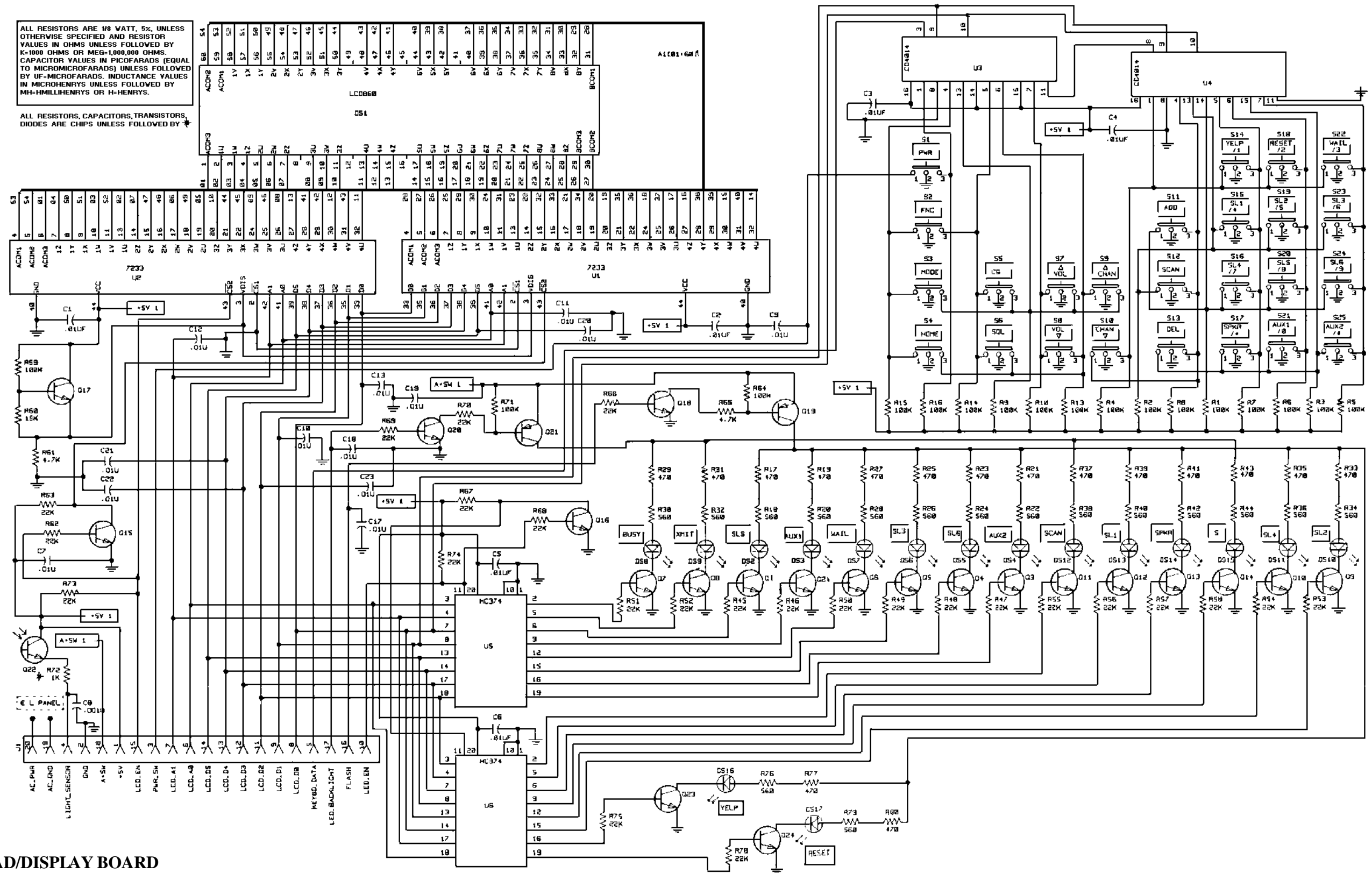
CAUTION
OBSERVE PRECAUTIONS
FOR HANDLING
ELECTROSTATIC
SENSITIVE
DEVICES

THE FOLLOWING ARE MOS DEVICES REQUIRING
SPECIAL CARE: U3, U4, U5, U6.

SCAN KEYPAD/DISPLAY BOARD
19D9092913G4, G6

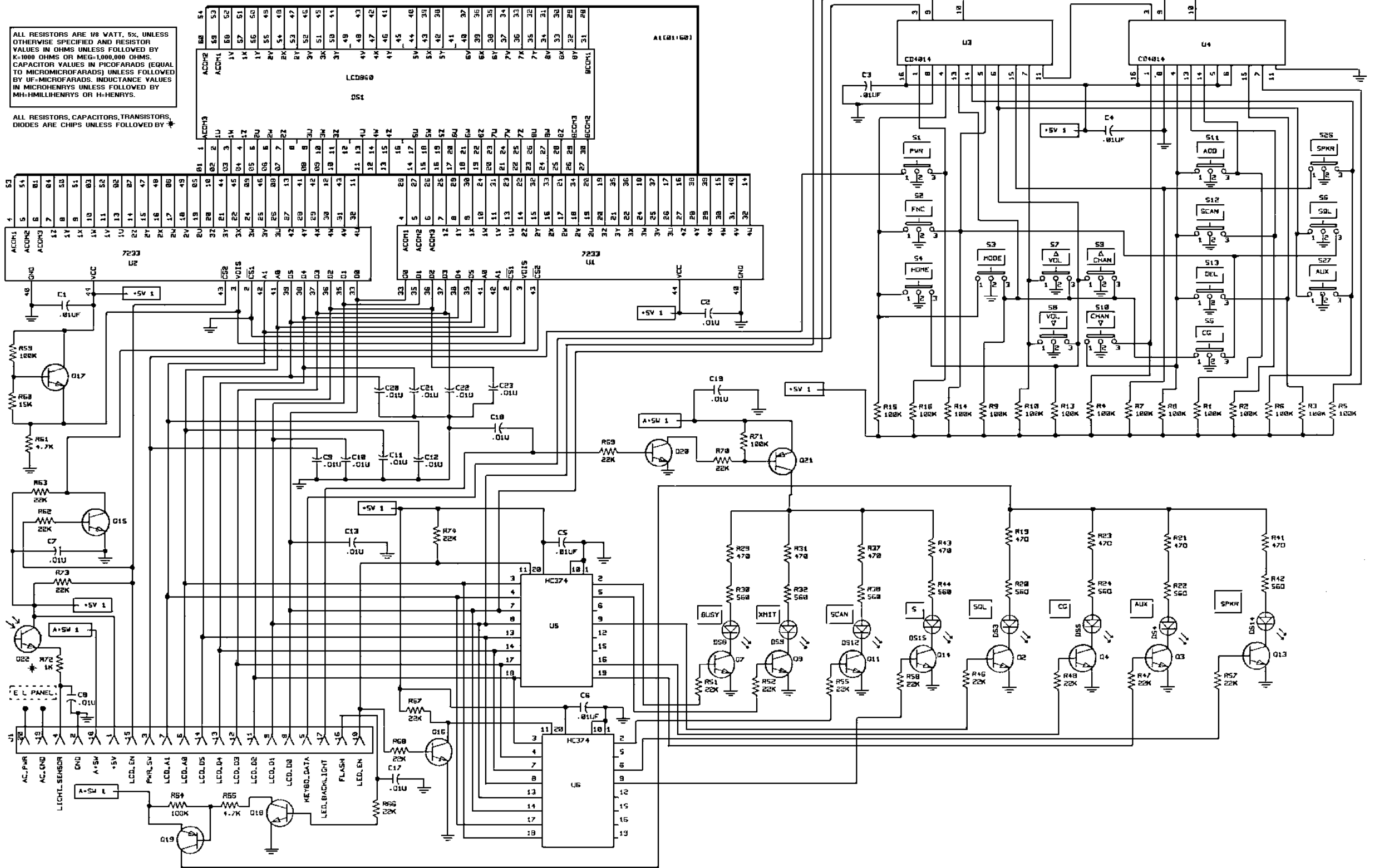
ALL RESISTORS ARE 1/8 WATT, 5%, UNLESS OTHERWISE SPECIFIED AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K=1000 OHMS OR MEG=1,000,000 OHMS. CAPACITOR VALUES IN PICOFARADS (EQUAL TO MICROMICROFARADS) UNLESS FOLLOWED BY UF= MICROFARADS. INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH= MILLIHENRYS OR H=HENRYS.

ALL RESISTORS, CAPACITORS, TRANSISTORS, DIODES ARE CHIPS UNLESS FOLLOWED BY *



SYSTEM KEYPAD/DISPLAY BOARD
19D902913G3, G5, G10

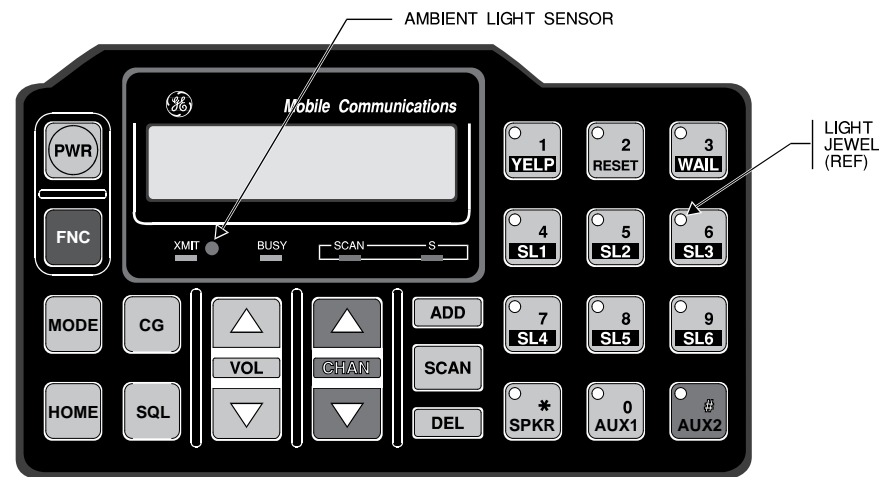
(19D902356, Sh. 1, Rev. 1)



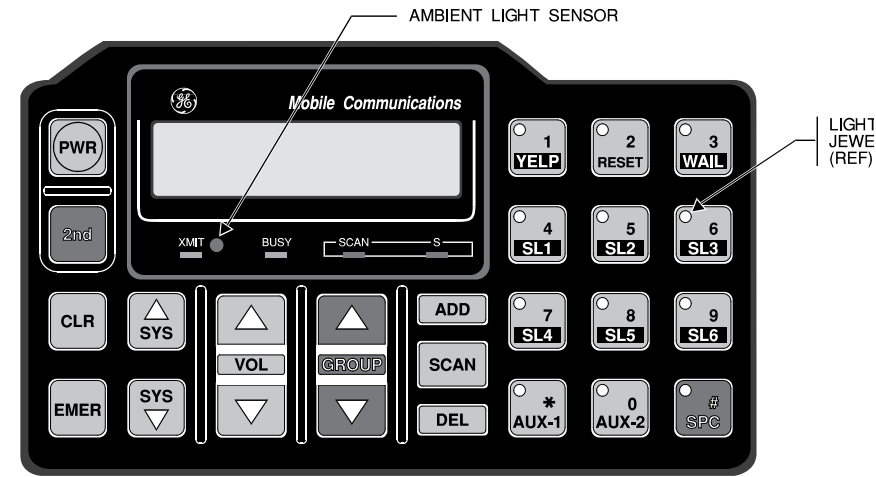
ALL RESISTORS ARE 1/8 WATT, 5%, UNLESS OTHERWISE SPECIFIED AND RESISTOR VALUES IN OHMS UNLESS FOLLOWED BY K=1000 OHMS OR MEG=1,000,000 OHMS. CAPACITOR VALUES IN PICOFRADS (EQUAL TO MICROMICROFRADS) UNLESS FOLLOWED BY UF=MICROFRADS. INDUCTANCE VALUES IN MICROHENRYS UNLESS FOLLOWED BY MH=HMILLIHENRYS OR H=HENRYS.

ALL RESISTORS, CAPACITORS, TRANSISTORS, DIODES ARE CHIPS UNLESS FOLLOWED BY

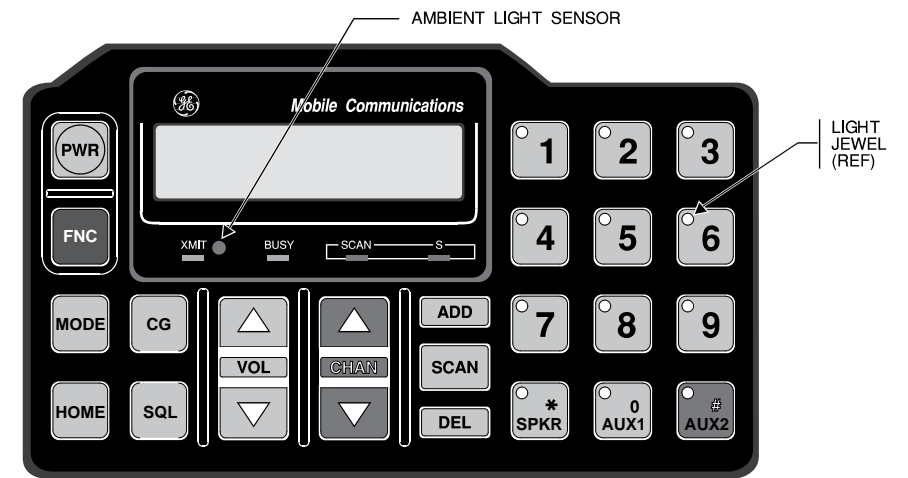
SCAN KEYPAD/DISPLAY BOARD
19D902913G4 & G6
(19D902355, Sh. 1, Rev. 1)



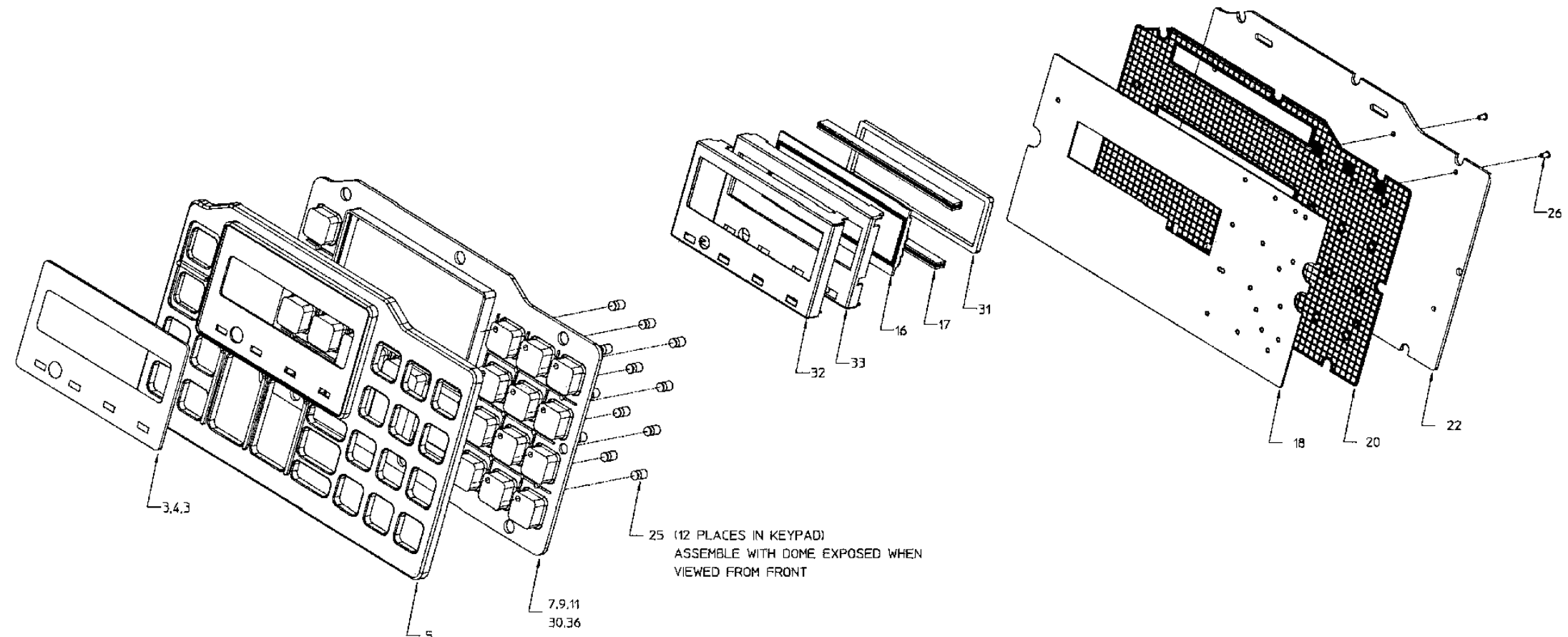
GROUP 3



GROUP 4



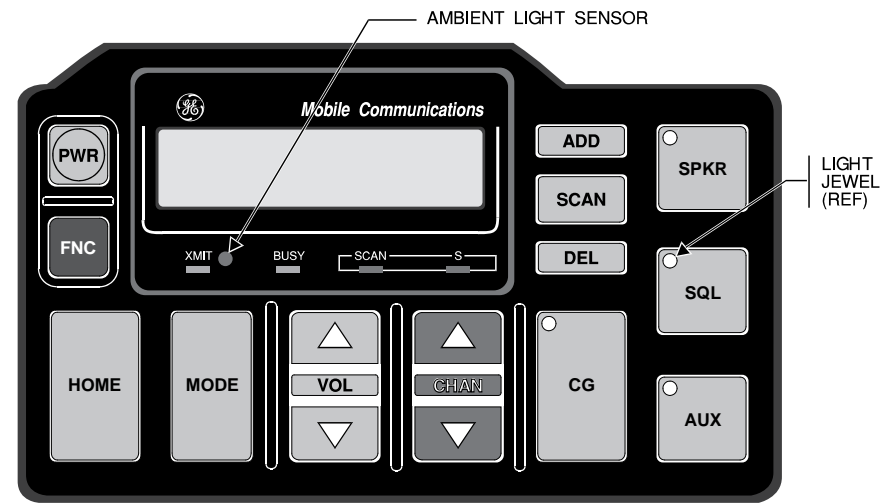
GROUP 5



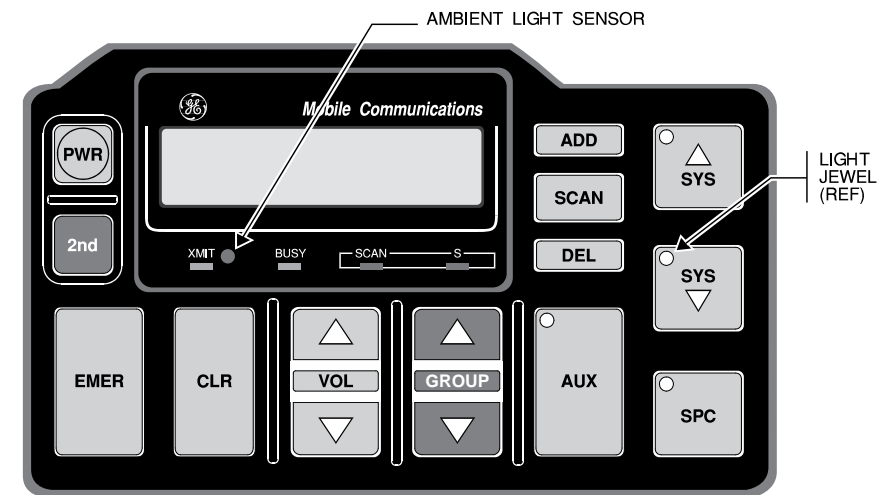
SYSTEM KEYPAD/DISPLAY PANEL

19D902913G3, G5, G10

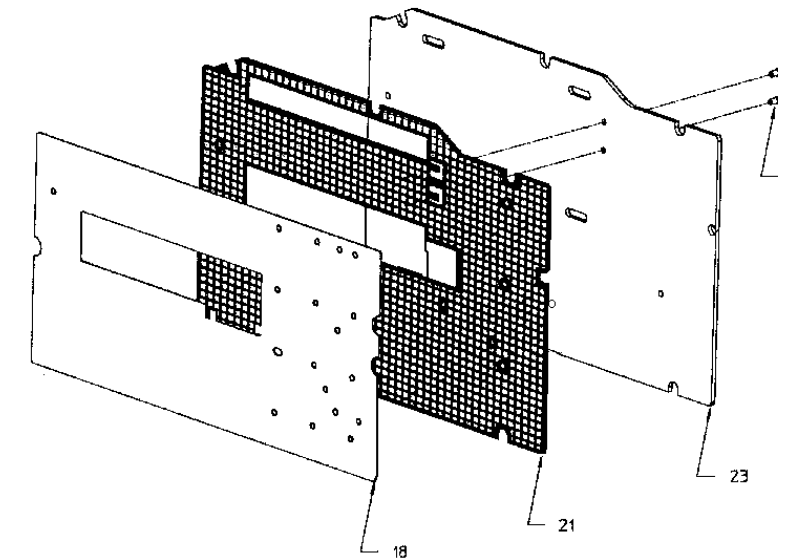
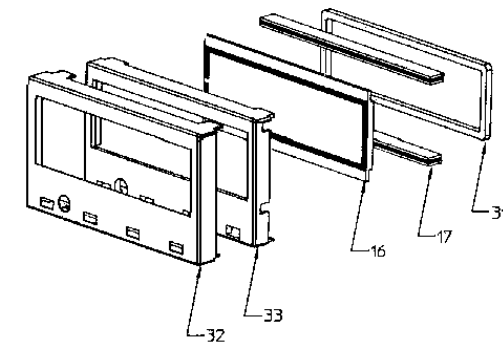
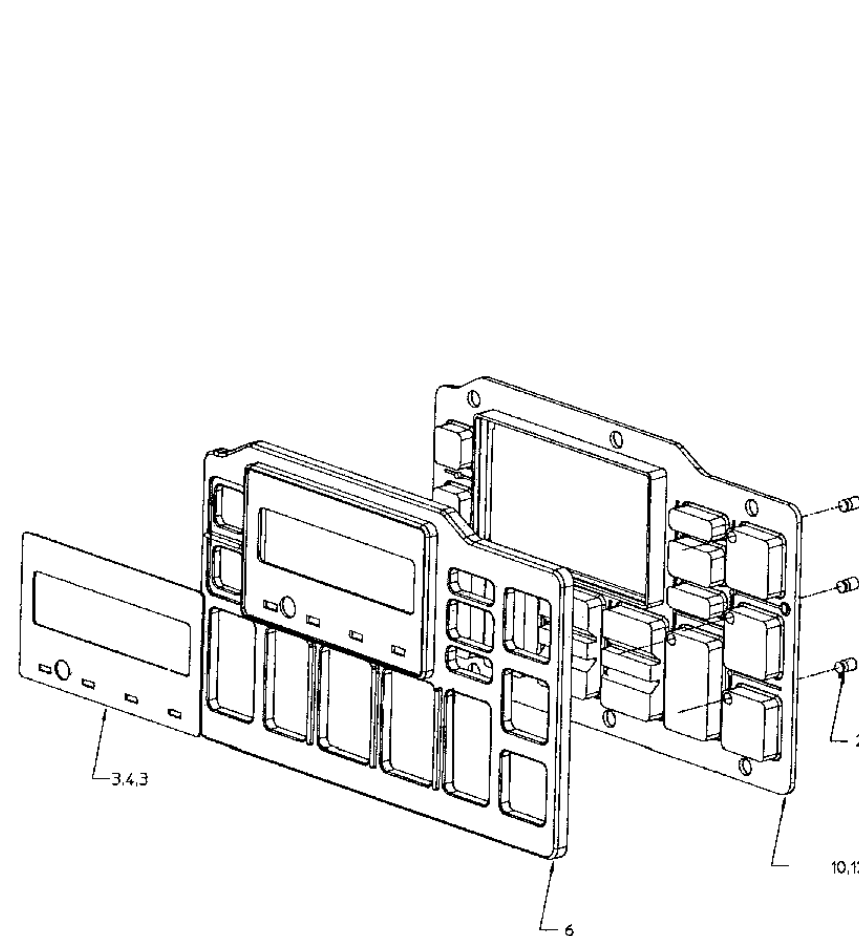
(19D902913, Sh. 1, Rev. 8)



GROUP 6



GROUP 10



SCAN KEYPAD/DISPLAY PANEL
19D902913G4 & G6

(19D902913, Sh. 2, Rev. 8)