



Z86L9900100ZC0

*Evaluation Board
for Z86L99 IR Controllers*

UM007401-0800



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Preface

Manual Objectives

User manual describes the evaluation board for ZiLOG's new Z86L99 family of IR microcontrollers.

Intended Audience

The user should be familiar with basic electronics and safety procedures and guidelines. This manual is written for those who test, evaluate and recommend Z86L99 microcontrollers.

Manual Organization

The Z86L99 Evaluation Board User Manual is divided into five sections.

Section 1 Overview

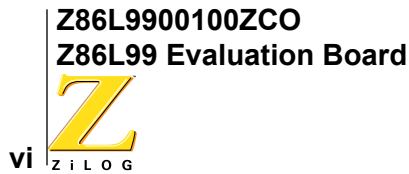
Presents an overview of the Z86L99 Evaluation Board. Also includes a list of the evaluation board kit contents.

Section 2 Installation and Operation

Includes procedures for pointing devices, IR keyboards, universal remote controls.

Section 3 Jumper Settings

Describes the jumpers on the Z86L99 Evaluation Board including default settings.



Section 4 Schematics

Provides complete schematics of the evaluation board including pin connections and gates.

Section 5 UIR Brand List

Lists major brand names with Zilog code numbers for televisions, VCR's, cable and satellite set top boxes, amplifiers, CD's, and DVD's.

Related Documents

Z86D99 OTP/L99 ROM Low-Voltage Microcontroller with ADC Product Brief (P/N PB002700-IRR1199)

Z86D99 OTP/L99 ROM Low-Voltage Microcontroller with ADC Product Specification (P/N PS0038-IRR0100)

T18/T16 Timer Architecture Application Note (P/N AN005800-IRR0200)



Evaluation Board for Z86L99 IR Controllers

1 Overview

The Z86L990100ZCO is the evaluation board for ZiLOG's new Z86L99 family of cost-effective IR microcontrollers. Z86L990 microcontrollers have three counter/timers, a 4 channel analog to digital converter, a constant current source, flexible input/output pins with flexible Stop Mode Recovery wake up sources. The Z86L99 microcontroller can be used to interface with a Varatouch pointing device sensor directly and can communicate with an IBM PC through PS2 connections. The Z86L990100ZCO evaluation board provides left and right buttons on the mouse and supports full PS2 mouse implementation with the Varapoint sensor. The Z86L990100ZCO evaluation board supports two pinouts:

Z86L990	40-pin version
Z86L991	28-pin version

The Z86L990100ZCO evaluation board also supports infrared wireless keyboard development. It has all 104 Windows 95 keys plus 28 keys reserved for the universal remote control function. The evaluation board comes with sample code to control standard IR keyboards.

The on-board infrared demodulator on the evaluation board is connected to the timer demodulation input. It provides a means for reception for the learning remote and two way infrared communication features.

The IR LED is directly driven by P43, the 100 mA controlled current output, reducing system cost for the amplification circuit.

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The firmware performs the universal remote control for TV, VCR, Cable, Satellite, CD, DVD, Amplifier, and other peripherals. It supports about 600 codes for various devices and brands. Because the Z86L99 is based on a Z8 core, the database code is 100% compatible with the code for the Z86L8800ZCO. The user can share data files between the Z86L9900100ZCO and the Z86L8800ZCO. From time to time, the data file might be updated; check with a local ZiLOG FAE for the most recent data file.

Kit Contents

- Z86L99 evaluation board
- PS2 extension cable
- PS2 adapter
- User Manual

2 Installation/Operation

Varapoint Pointing Device Function

Use the following procedure to enable the Varapoint Pointing Device:

1. Switch the POWER switch to "PC".
2. Connect the PS2 socket with the cable provided to the IBM PC PS2 mouse port.
3. Move the Varapoint sensor and observe the movement on the PC.
4. Adjust variable resistor R6 for the best sensitivity performance.

IR Keyboard

Select the device by pressing and holding the “CODE SET” key (at row 0 column 1) for 3 seconds. The visible LED D7 turns ON while the key is pressed and then OFF after 3 seconds. Press and release the following three digit keys one by one to enter the code:

- 000 for M@IL TV (default)
- 001 for WEB TV
- 002 for SEJIN wireless keyboard

Universal Remote Control

Use the following procedures to enable a universal remote control:

1. Changing a device (device can be TV, VCR, CABLE, SAT and so forth)
Press and release any device key (for example, a TV, VCR, CABLE or AUX1).
2. Changing a code (CODE is the 3-digit number for the code selected)
 - a. Press and hold the device key for 3 seconds. The LED stays ON for 3 seconds and then turns off.
 - b. Release the device key. The LED is ON.
 - c. Press and release the 3 digit keys one by one. The LED stays OFF when pressing a key and ON when the key is released.
 - d. The LED flashes 3 times to indicate success after entering the 3 digit code. The LED does not flash if a non-digit key is pressed or the code number is higher than the limit. If the LED does not flash, repeat the change code sequence.

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3. Checking the code number
 - a. Press and hold the device key for 3 seconds. The LED comes ON for 3 seconds and then turns off.
 - b. Press and release the SELECT key
 - c. The flashing LED shows the code number. A quick flash means zero, a slow flash means one. It displays the factor of one hundred, stops for 2 seconds, then flashes the factor of ten, stops for 2 seconds, then flashes the digit factor.
4. Auto-scanning
 - a. Press and hold the device key for 3 seconds. The LED comes ON for 3 seconds and then turns off.
 - b. Press and release the POWER key.
 - c. Press Ch+ to search forward. The UIR sends out the POWER signal of the next higher code number.
 - d. Press Ch- to search downward. The UIR sends out the POWER signal of the next lower code number.
 - e. Press the SELECT key to store the correct code.
 - f. The LED flashes 3 times if the code is stored. The LED flashes quickly 8 times if the code search is finished, or goes back to the beginning code number.
5. Key Map

Figure 1 identifies which keys are Universal IR , Keyboard mode, and VCR/DVD.



	B	A	9	8	7	6	5	4	3	2	1	0
A	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12
9	ESC	0	1	2	3	4	5	6	7	8	9	BACK SP
8	A	B	C	D	E	F	G	H	I	J	K	L
7	M	N	O	P	Q	R	S	T	L ALT	AV	ARROW UP	REW
6	U	V	W	X	Y	Z	/		R ALT	RECALL	ARROW DN	PLAY
5	/	/	-	=	TV	VCR	SAT/CAB	-	POWER	L SHIFT	ARROW L	FF
4	'	,	.	:	NO NUM	NO /	NO*	NO -	CH UP	R SHIFT	ARROW R	REC
3	TAB	PR SCR	SCROLL	PAUSE	NO 7	NO 8	NO 9	NO +	CH DN	SELECT	L WIN	STOP
2	CAP	INS	HOME	PG UP	NO 4	NO 5	NO 6		VOL UP	ENTER	R WIN	PAUSE
1	SPACE	DEL	END	PG DN	NO 1	NO 2	NO 3	NO ENTER	VOL DN	DISPLAY	MENU	L CTRL
0	L ARROW	R ARROW	UP ARROW	DN ARROW	APP	NO 0	NO .	RETURN	MUTE	CLEAR	CODE SET	R CTRL

LEGEND: KEYBOARD UIR MODE VCR/DVD

Figure 1 Z86L9900100ZCO Key Map



3 Jumper Settings

Table 1 lists the settings for the jumpers.

Table 1 Jumper Settings

Jumper	Default	Description
J1	1-2 Open 3-4 Open 5-6 Open 7-8 Open	Close if AUX LED is driven by P54 Close if SAT/CAB LED is driven by P55 Close if VCR LED is driven by P56 Close if TV LED is driven by P57
J2	Open	Close if IR demodulator is connected to P52
J3	Open	Close if IR demodulator is connected to P51
J4	Close	Close if visible LED is connected to Vcc
J5	Open	Close if visible LED D7 is controlled by P43
J6	Close	Close if IR LED D6 is driven directly by P43
J8	2-3 close	1-2 close if VREF+ = Vcc 2-3 close if VREF+ is biased
J9	2-3 close	1-2 close if VREF- = Ground 2-3 close if VREF- is biased
J10	1-2 close 2-3 close 5-6 close 7-8 close	Close if PS2 communication is selected
J11	open	Close if 28 pin package is emulated
J12	Close	Close if Varapoint module is used
J14	Close	P20..P27,P50,P52,P53 are connected to row 0..row 10

Table 1 Jumper Settings (Continued)

J15	Close	P60..P67,P40,P45,P46,P47 are connected to column 0.. column11
J17	Close	Close if LED D8 indicate the power ON signal
J18	Open	Close if R16 provides an analog reference to P53
J19	Open	Close if R16 provides an analog reference to P53
J20	Open	Close if R16 provides an analog reference to P53
J21	Open	Close if R17 provides an analog reference to P50
J22	Open	Close if R17 provides an analog reference to P50
J23	Open	Close if R17 provides an analog reference to P50

4 Z86L9900100ZCO Schematics

Schematics can be found in Appendix B or at [Z86L9900ZCO Schematics](#).

- **Notes:**
- 1 The IR Receiver (U8) only works at 5V.
It does NOT WORK at 3V.
 - 2 Remove Crystal Y2 if emulating with the Z86L9900100ZEM.



5 UIR Brand List with Code Numbers

Table 2 lists Television brands with code numbers.

Table 3 lists VCR brands with code numbers.

Table 4 lists cable brands with code numbers.

Table 5 lists satellite brands with code numbers.

Table 6 lists amplifier brands with code numbers.

Table 7 lists Compact Disk brands with code numbers.

Table 8 lists DVD brands with code numbers.

Table 2 Television Brands

Brand	Zilog Code Numbers
Admiral	116 234
Adventura	235
Aiko	126
Akai	063 091 117
Alba	033
Alleron	151
A-Mark	029
Amstrad	090
Amtron	145
Anam	028 029 083 105 145
Anam National	248 249 269
AOC	014 029 099 108 109 118 119 120 251
Archer	029
Audiovox	029 145

Table 2 Television Brands (Continued)

Brand	Zilog Code Numbers
Bauer	035
Belcor	118
Bell & Howell	116 183 230
Bradford	145
Brockwood	014 118
Candle	014 095 097 098 108 118 120 121 235
Capehart	014
Celebrity	117
Circuit City	014
Citizen	018 094 095 096 097 098 101 108 118 120 121 126 145 199 235 236
Colortyme	014 118 120 122 254
Concerto	097 118 120
Contec	049 083
Contec/Cony	123 124 145
Craig	015 083 145
Crown	094 145
Curtis Mathes	094 101 108 115 118 120 125 199 230
CXC	083 145
Daewoo	002 091 092 094 109 118 119 120 126 127 213 214 256
Daytron	014 118 120
Dimensia	115



Table 2 Television Brands (Continued)

Brand	Zilog Code Numbers
Dixi	029 052 091
Dumont	014 118
Electroband	117
Electrohome	003 005 094 118 120 128 129 130 269
Elta	091
Emerson	001 012 014 083 084 085 086 087 088 089 090 094 118 120 123 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 211 230 236 237 260 270
Envision	108 118 120
Etron	091
Fisher	050 082 153 154 155 230
Formenti	035
Fortress	039
Fujitsu	015 089 151
Funai	015 083 089 145 151
Futuretec	145
Futuretech	015 083
GE	014 020 080 081 084 102 105 106 111 115 118 120 130 156 187 231 232 239 269
Genexxa	033
Gibraltar	118
Goldstar	014 052 078 079 094 097 109 118 119 120 123 128 129 159 160 161 228

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Table 2 Television Brands (Continued)

Brand	Zilog Code Numbers
Granada	003 014
Grand	014
Grandiente	003
Grundy	145 151
Hallmark	014 118 120
Harvard	145
Hinari	089
Hitachi	003 010 024 071 072 073 074 075 076 077 094 097 118 120 123 124 163 164 218 221 222 223 224 237 253
Hitachi Pay TV	273
IMA	145
Infinity	064 165
Janeil	235
JBL	064 165
JC Penney	046 081 094 101 108 109 111 115 118 119 120 121 130 156 161 166 167 174 187 199 239 255
JCB	117
Jensen	070 118 120
JVC	066 067 068 069 123 124 163 168 169 229 240
Kawasho	065 117 118 120
Kenwood	108 118 120 128 129
Kloss	036 098 235



Table 2 Television Brands (Continued)

Brand	Zilog Code Numbers
Kloss	
Novabeam	170 171 241
KTV	083 084 085 094 145 172 236
Lloyds	014
Loewe	165
Logik	183 266
Luxman	097 118 120
LXI	025 030 047 050 064 111 115 120 153 165 173 174 175 230 239
Magnavox	004 036 064 095 099 108 118 120 121 128 165 170 171 176 177 178 184 188 215 216 217 241 267
Majestic	183
Marants	165 052 064 108 118 120 165 179
Matsui	091
Megatron	014 120
Memorex	014 050 091 116 120 182 183 230 266
MGA	014 062 108 109 110 118 119 120 128 129 130 155 180 182
Midland	239
Minutz	156
Mitsubishi	007 014 027 061 062 063 109 110 118 119 120 128 129 130 155 180 181 182 212
Motorola	234 269
MTC	014 097 101 108 109 118 119 120 199
Multitech	145

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Table 2 Television Brands (Continued)

Brand	Zilog Code Numbers
NAD	014 030 112 120 173 174 243
National	013 105 013
NEC	023 097 100 107 108 109 118 119 120 129 185 254 269
Nikkai	033 034
Nikko	014 120 126
Normande	000
NTC	126
Onwa	083 145
Optimus	243
Optonica	037 039 192 234
Orion	015 142 260
Osaki	034
Panasonic	006 011 012 013 060 064 104 105 106 165 263 265 269
Philco	036 095 108 109 118 119 120 121 123 128 165 170 171 176 178 184 241 267 269
Philips	052 064 118 121 123 128 165 170 171 177 186 187 188 269 176
Pilot	118
Pioneer	059 077 112 118 120 189 190 237 243 264
Portland	094 109 118 119 120 126
Price Club	199
Proscan	111 115 239
Proton	014 026 094 103 120 123 191 244 118

Table 2 Television Brands (Continued)

Brand	Zilog Code Numbers
Pulsar	113 118
Quasar	011 105 106 172 263 269
Radio Shack	034 037 083 094 115 118 120 123 145 153 192 230
RCA	016 017 025 053 054 055 056 057 058 077 102 109 111 115 118 119 120 128 193 194 196 197 239 245 256 269 273 274
Realistic	050 118 120 123 145 153 192 230
Saisho	090 091
Sampo	108 118 120
Samsung	000 008 014 034 052 091 094 097 101 108 109 118 119 120 123 125 127 128 129 198 255
Sansui	260
Sansung	199
Sanyo	049 050 051 082 118 153 154 180 200 230
SBR	052
Schneider	052
Scotch	120
Scott	083 087 089 094 118 120 123 132 142 145 151
Sears	009 014 030 040 041 042 043 044 045 046 047 050 051 082 089 097 111 118 120 124 128 129 151 153 154 155 169 173 174 201 202 230 239
Seimitsu	014
Sharp	021 022 037 038 039 049 094 118 120 123 137 192 203 205 210 234
Shogun	118



Table 2 Television Brands (Continued)

Brand	Zilog Code Numbers
Siemens	049
Signature	116 183 266
Simpson	121
Sony	114 117 259 268 272
Soundesign	014 083 095 118 120 121 145 151
Spectricon	029 099
Squareview	015
SSS	083 109 118 145
Starlite	145
Supra	097
Supre-Macy	098 235
Supreme	117
Sylvania	035 036 064 095 108 118 120 121 128 165 170 171 176 177 178 188 207 241 267 184
Symphonic	015 145 270
Tandy	033 039 234
Tatung	105 237 269
Technics	106
Techwood	097 118 120 157
Teknika	031 032 083 089 094 095 096 097 098 101 109 110 118 119 120 121 123 124 126 145 151 177 182 183 199 266
Teletch	091

Table 2 Television Brands (Continued)

Brand	Zilog Code Numbers
Tera	103 244
Thomas	014
Thompson	005
TMK	014 097 118 120
Toshiba	019 030 046 050 101 153 173 174 199 201 230 255
Totevision	094
Toyomenko	014
Universal	081 156 187
Vector Research	108
Victor	069 169 240
Video Concepts	063
Vidtech	014 109 118 119 120
Viking	98 235
Wards	037 081 089 102 108 109 116 118 119 120 128 132 151 156 156 165 170 171 176 177 183 184 187 188 192 208 209 266 267 268 270
Yamaha	108 109 119 120 128 129
York	014
Zenith	113 118 183 226 227 261 266 271
Zonda	029



Table 3 VCR Brands

Brand	Zilog Code Numbers
Admiral	154
Aiko	169
Aiwa	021
Akai	075 076 077 136 137 138 139 140 156 157 141 155
Alba	115
Amstrad	021
ASA	101
Asha	160
Audio Dynamics	012
Audio Dynamics	158
Audiovox	161
Beaumarck	160
Broksonic	159
Broksonic	167
Bush	020
Calix	161
Candle	017 160 161 162 163
Canon	108 117
Capehart	115 116
Capeheart	074 164
Carver	036
CCE	035 169

Table 3 VCR Brands (Continued)

Brand	Zilog Code Numbers
Citizen	017 018 160 161 162 163 169
Colt	035
Craig	005 018 035 160 161 165
Curtis Mathes	08 017 078 108 153 163 166 160
Cybernex	160
Daewoo	074 114 115 123 167 169 170 162
Daytron	074 115
DBX	012 158
Dumont	112
Dynatech	021
Electrohome	004 161 171
Electroponic	161
Emerson	004 019 021 023 038 077 079 142 143 144 145 146 147 159 161 162 166 167 171 173 174 175 176 177 178 179 180
Fisher	003 05 021 025 026 028 029 080 086 112 113 165
GE	008 018 030 052 078 108 109 110 111 153 160
Go Video	106 107
Goldstar	002 017 031 126 161
Goodmans	020
Gradiente	168
Grundig	101
Harley Davidson	168



Table 3 VCR Brands (Continued)

Brand	Zilog Code Numbers
Harman Kardon	098 126
Harwood	035
Hinari	020
Hi-Q	165
Hitachi	015 016 021 032 033 072 075 118 119 120 121 122
JC Penney	011 012 018 072 080 108 126 158 160 161
Jensen	032 075
JVC	011 012 017 075 082 102 103 104 105 158
Kenwood	011 012 017 075 082 089 104 158 163
KLH	035
Kodak	161
Lloyd	021 168
Logik	020 035
LXI	161
M. Wards	004 005 006 018 019 020 021 108 129
Magnavox	36 37 101 108 129
Magnin	160
Marantz	010 011 012 017 036 101 108 158 163
Marta	161
MEI	108
Memorex	005 021 089 100 108 112 124 154 160 161 165 168
MGA	004 038 077 099 171



Table 3 VCR Brands (Continued)

Brand	Zilog Code Numbers
MGN Technology	160
Midland	030
Minolta	032 072
Mitsubishi	004 032 038 039 040 041 042 044 045 046 047 071 077 082 097 098 099 104 171
Motorola	154
MTC	021 160 168
Muktitech	160
Multitech	030 035 163 168 018 020 021
NAD	096
NEC	009 010 011 012 013 017 049 050 051 075 082 104 125 126 158
Nikko	161
Noblex	160
Optimus	154 161
Optonica	065
Panasonic	001 014 073 108 130 132 133 134 135
Pentax	017 032 072 121 163
Perdio	021
Philco	036 037 108
Philips	065 101 108 181 36
Pilot	161
Pioneer	012 032 052 053 082 093 094 095 096 104 158

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Table 3 VCR Brands (Continued)

Brand	Zilog Code Numbers
Portland	074 115 163
Proscan	008 052 129 153
Protec	035
Pulsar	124
Quartz	089
Quasar	091 092 108
Radio Shack	003 004 005 006 026 065 154 160 161 165 168 171
Radix	161
Randex	161
RCA	000 007 008 018 032 052 054 055 056 057 060 061 062 072 078 121 127 128 129 130 131 153 155 160
Realistic	021 026 065 086 089 108 112 154 160 161 165 168 171
Ricoh	150
Saisho	145 146
Salora	089 099
Samsung	018 030 076 090 110 123 138 156 160 162 174
Sanky	154
Sansui	012 063 075 082 104 125 158
Sanyo	005 087 088 089 112 160 165
SBR	101
Schneider	020
Scott	019 038 064 144 159 162 167 173



Table 3 VCR Brands (Continued)

Brand	Zilog Code Numbers
Sears	003 005 025 026 028 032 072 080 086 089 112 113 161 165
Sentra	115
Sharp	004 006 065 065 171
Shintom	020 035
Shogun	160
Singer	035
Sony	148 149 150 151 152
STS	072
Sylvania	021 036 037 038 099 108 168
Symphonic	021 168
Tandy	021
Tashiko	021 161
Tatung	011 075 085
Teac	011 021 056 075 168
Technics	073 108
Teknika	021 022 067 108 161 168
TMK	146 160 166
Toshiba	019 026 028 032 038 064 099 123 162
Totevision	018 160 161
Unitech	160
Vector Research	012 126 158 162 163
Victor	012 104 105 158



Table 3 VCR Brands (Continued)

Brand	Zilog Code Numbers
Video Concepts	012 077 158 162 163
Videosonic	018 160
Wards	032 035 048 065 068 069 070 072 154 160 161 162 165 168 171
XR-1000	035 168
Yamaha	011 012 017 075 126 158
Zenith	124 151 152

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Table 4 Cable Brands

Brand	Zilog Code Numbers
ABC	007 008 009 010
Archer	011 012
Century	012
Citizen	012
Colour Voice	013 014
Comtronic	015
Eastern	016
Garrard	012
Hytex	007
Jasco	012
Jerrold	005 017 018 030 009 010
Magnavox	019
Movie Time	020
NSC	020
Oak	000 021 007
Panasonic	001 006
Philips	024 012 013 014 019
Pioneer	002 003 025
RCA	034
Regency	016
Samsung	026 015
Scientific Atlanta	003 004 027 028



Table 4 Cable Brands (Continued)

Brand	Zilog Code Numbers
Signal	015
SL Marx	015
Starcom	010
Stargate	015
Televue	015
Tocom	008 017
TV86	020
Unika	012
United Artists	007
Universal	012 011
Viewstar	020 019
Zenith	003 032 033

Table 5 Satellite Brands

Brand	Zilog Code Numbers
Alphastar	019
Chaparral	000 001
Cheyenne	001
Dishnet	018
Drake	002
Drake	003

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Table 5 Satellite Brands (Continued)

Brand	Zilog Code Numbers			
Echostar Dish	027			
GE	013	020	021	
General Instruments	004	005	006	
Hitachi	023	024		
Hughes Network	017	028		
JVC	022			
Magnavox	025			
Philips	025			
Primestar	016			
Proscan	020	021	013	
RCA	013	020	021	
Realistic	007			
Sierra	001			
Sony	014			
STS	008	009	010	011
Toshiba	012	015		
Uniden	026			



Table 6 Amplifier Brands

Brand	Zilog Code Numbers							
AIWA	002	038	039	033	034	035	036	037
Carver	021							
Citizen	024							
Fisher	021							
GE	026							
Goldstar	005							
Hitachi	032							
JVC	018	040						
Kenwood	006	041						
Luxman	001							
Magnavox	020							
Marantz	023							
Memorex	007							
NAD	011							
Nakamichi	009							
NEC	031							
Onkyo	004	014	015					
Optimus	012							
Panasonic	022							
Pioneer	003	017	007					
Proton	020							
Quasar	022							

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Table 6 Amplifier Brands (Continued)

Brand	Zilog Code Numbers
RCA	019 042
Scott	016
Sharp	027 030
Sherwood	010
Sony	008 002 043 044
Techniques	022
Toshiba	025
Victor	018
Yamaha	000 013 045 046



Table 7 CD Brands

Brand	Zilog Code Numbers		
ADC	017		
ADO	018		
Aiwa	000	019	
Akai	020		
Denon	022		
Dynatech	001		
Emerson	002		
Fisher	003	025	026
GE	027		
Hitachi	004		
Inkel	028		
JVC	005	029	
Kenwood	006	030	031
Luxman	032		
Magnavox	053		
Marantz	008	033	
MCS	034		
Mitsubishi	035	036	
Nakamichi	038	039	
NEC	007		
Onkyo	009	040	041
Optimus	042	043	044

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Table 7 CD Brands (Continued)

Brand	Zilog Code Numbers		
Panasonic	010		
Pioneer	011	045	
RCA	012	024	
Sanyo	052		
Sears	021		
Sherwood	046		
Sony	013	023	047
Teac	048	049	050
Technics	014		
Toshiba	037		
Yamaha	015	016	051

Table 8 DVD Brands

Brand	Zilog code Number
JVC	005
Magnavox	004
Mitsubishi	003
Pioneer	002
RCA	006
Sony	001
Toshiba	000

Appendix A Acronyms

UIR	Universal Infrared Remote
OTP	One Time Programmable
TV	Television
VCR	Video Cassette Recorder
CD	Compact Disc
MCU	Microcontroller
LED	Light Emitting Diode
RF	Radio Frequency
PCB	Printed Circuit Board
EEPROM	Electrical Erasable Programmable Read Only Memory

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