

Chapter 11 – Assistive Technology for Activities For Daily Living

Introduction.....	1
Eating and Drinking Continuum.....	2
Meal Time Continuum	3
Self-Care Continuum.....	4
Assistive Technology for Control of Environment	5
Multi-Function Electronic Aids to Daily Living Comparison Charts.....	6
Resource List for Daily Living Continuums.....	17

Assistive Technology for Activities of Daily Living

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Introduction

Past versions of the ASNAT manual had one chapter that included Assistive Technology for Recreation and Leisure, Activities of Daily living (ADL), and supports for students with multiple disabilities in the same section. In this edition of the manual we have separated these three areas.

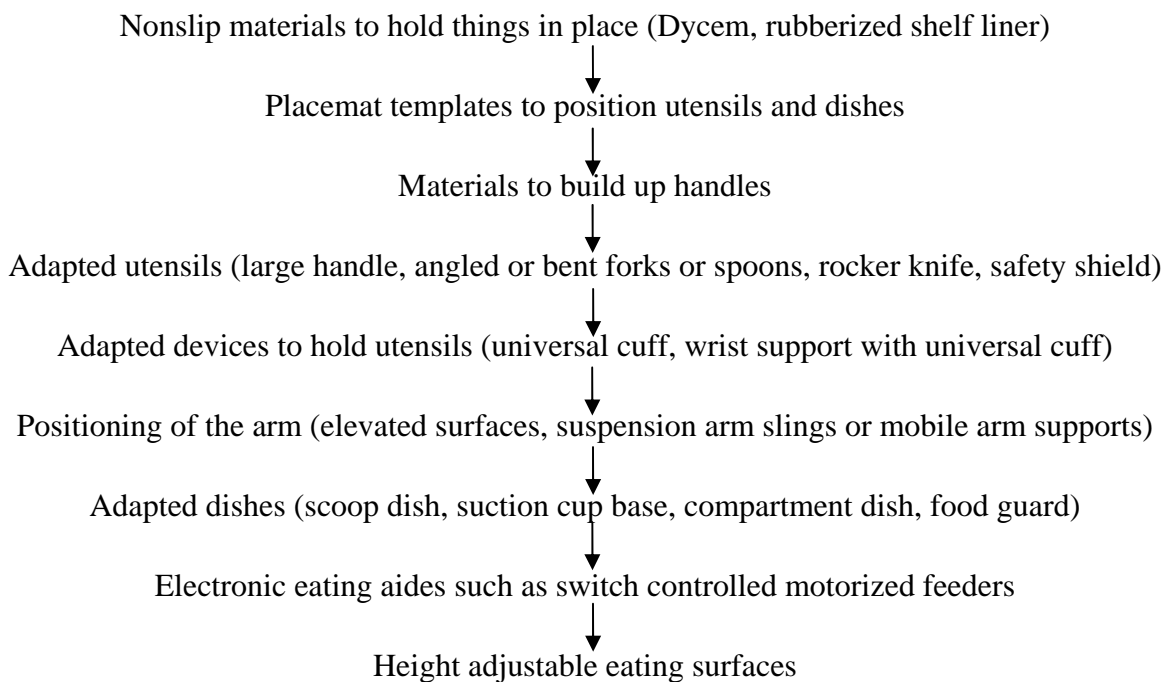
We have created three continuums to assist teams in looking at ADL goals in the areas of eating and drinking, meal time, and self-care. These areas are very specific and well supported by Occupational Therapists (OT). We strongly suggest that you rely on your OT for information on items in these areas. The section includes a chart on electronic aides for daily living.

At the end of the chapter is a very basic resource list of examples of the items mentioned in the continuums.

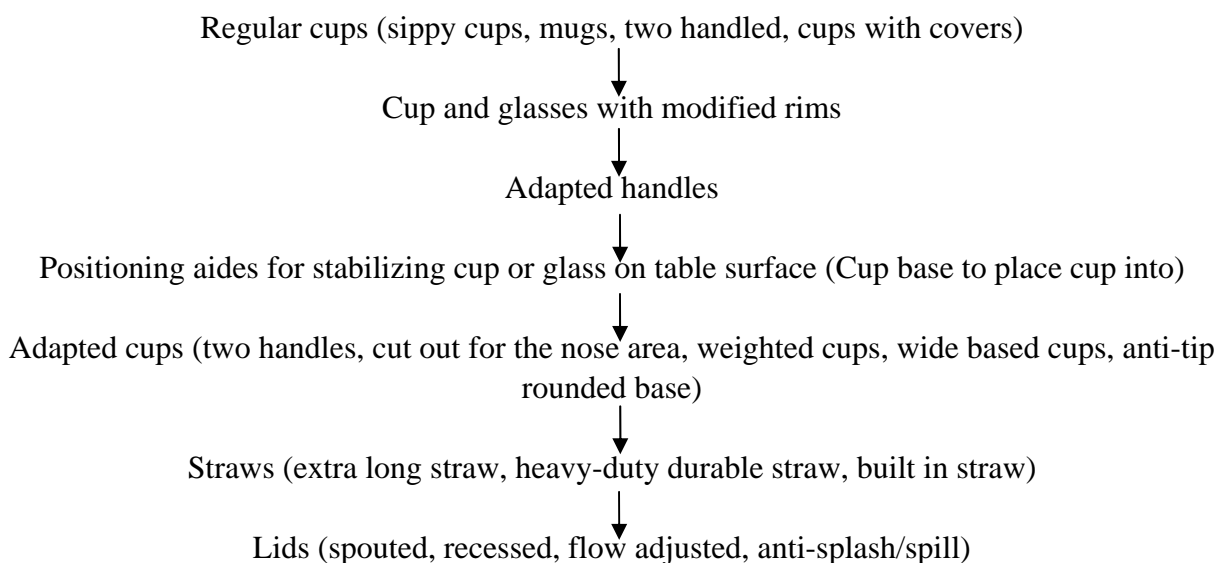
A CONTINUUM OF CONSIDERATIONS FOR ASSISTIVE TECHNOLOGY

Eating and Drinking

Eating



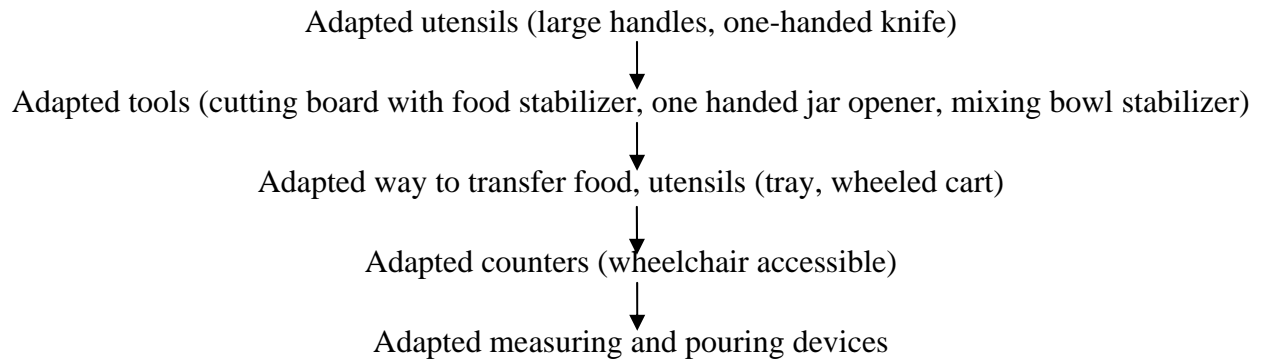
Drinking



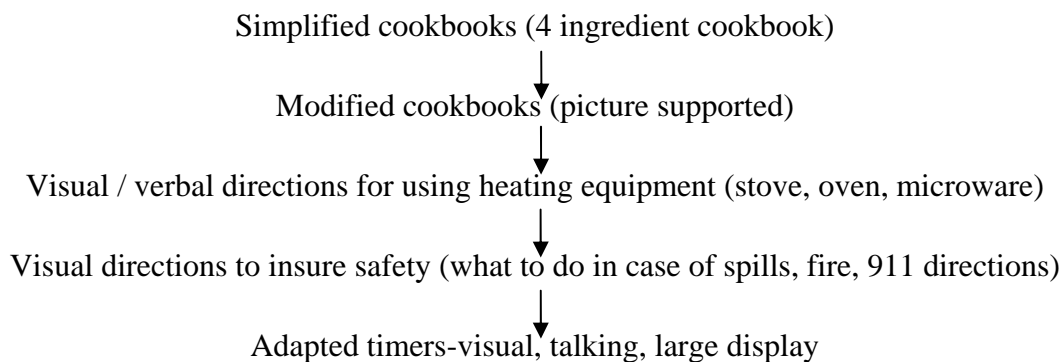
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Meal Time

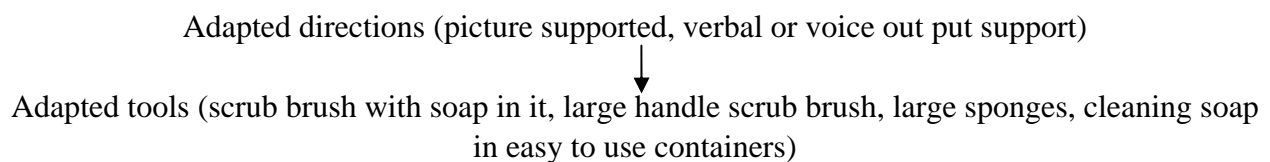
Food Prep



Cooking



Clean up



A CONTINUUM OF CONSIDERATIONS FOR ASSISTIVE TECHNOLOGY

Self-Care

Dressing

Specifically chosen clothing (elastic waist, pull over tops, easy fasteners)



Adapted clothing (Velcro fasteners, large buttons)



Tools to assist in dressing (button hook, stocking aid, large zipper pulls, dressing stick)

Hygiene Self-Care

Adapted tools



Tooth brushes-large handle, vibrating, spinning tooth brushes



Brushes and combs long, large handle or universal cuff hair brushes or combs; hair dryer stands



Pump style containers (toothpaste, soap, shampoo, body wash, lotions)



Adapted bathing aides tools (washcloth mitts, long handle back scrubber, tub chair

Transferring devices (transfer chair, lift)



Toileting aides- (toilet back support, mobile or stationary toilet chair, bath chair)



Accessible bathrooms including non skid surfaces, grab bars, or other environmental safety items

Assistive Technology for Control of the Environment

Electronic aids to daily living (EADLs) enable the person with disabilities to have more control of their environment. They go beyond the technologies described in the previous pages on activities of daily living as they pertain to electronic devices only. By virtue of that characteristic, they tend to be higher, more complex technologies.







When the person lacks mobility, motor, or cognitive skills that prevent them from performing even the simplest tasks, EADLs can provide them with some basic control over their daily life. Individuals control even the smallest amount of movement by using various types of switches. Text or pictures can be used to access the devices. Different types of input (direct, switch, voice) are available. The user can accomplish control by using either X-10, which is a wireless communication "language" that allows compatible products to talk to each other using the existing electrical wiring in the home (on/off control for lights, appliances, door openers, etc.), or infrared (for TVs, VCRs, infrared phone, etc.).

The following charts, developed by Michelle L. Lange, OTR, ABDA, ATP, give the reader valuable information and detail about EADLs. The multi-function electronic aids to daily living comparison charts details the type of access, controls, signal use, portability, display, and battery backup for different devices. The reader can then begin to determine the features that will best match the needs of the person with a disability.

Chapter 11 - Assistive Technology for Activities of Daily Living







Electronic Aids to Daily Living (EADLs) control devices in the environment using an alternative method, to provide independent control for persons with physical, sensory and/or cognitive impairments.



Direct Access Systems											
Remote control models and prices change frequently. Check with the manufacturer.											
EADL NAME	PHOTO	ACCESS	CONTROLS	IR		MACR	PORT	BATRY	DISPLAY	COMMENTS	COST/ PROD#
				Stord	Irn	OS	ABLE	BKUP			
GEWA Access Prog Zygo Industries 800-234-6006 www.zygo-usa.com		Direct One or two switches	IR functions: 205 X10 functions: through IR/X10 converter	no	yes	yes	yes	yes	Static overlays	Large 36 keys	\$1925 425602
Insteon RemoteLinc Wireless Remote Control Smarthome 800-762-7846 www.smarthome.com		Direct	Insteon functions: 6 scenes 417 devices	n/a	n/a	yes	yes	yes	Buttons	Remote works up to 150' from access point. Access Point required: #2443, \$39.99.	\$59.99 2440
Maxi Controller X-10 (USA), Inc. 800-675-3044 www.x10.com		Direct	X10 functions: 16 devices through powerline	n/a	n/a	yes	no	no	Text	Preset macros: all lights on, all lights off	\$24.99 SC503- HA
Universal 5-in-1 Learning Remote X-10 (USA), Inc. 800-675-3044 www.x10.com		Direct	IR functions: 5 devices X10 functions: 16 devices through RF and powerline	yes	yes	no	yes	yes	Backlit buttons Text		\$49.99 UR74A
Vizia RF Z-Wave Programmer Smarthome 800-762-7846 www.smarthome.com		Direct	Z-Wave functions: 256 devices Can create scenes	n/a	n/a	yes	yes	yes	Display Buttons		\$145.99 45020
Wireless Remote Control System X-10 (USA), Inc. 800-675-3044 www.x10.com		Direct	X10 functions: 8-16 devices through RF and powerline	n/a	n/a	yes	yes	yes	Text	To control more than 8 X-10 functions, must slide lever. Kit includes transceiver, receiver, 2 modules.	\$39.99 HR12A- SP-LAT- PS18





Chapter 11 - Assistive Technology for Activities of Daily Living



Switch Access Systems											
Choices are scanned and selected by a switch activation											
EADL NAME	PHOTO	ACCESS	CONTROLS	IR	MACR	PORT	BATRY	DISPLAY	COMMENTS	COST/	PROD#
				Stord	OS	ABLE	BKUP				
Angel FX Angel ECU 772-834-1989 www.angelecu.com		Switch: 1 - 2	IR functions: 1300 X10 functions: 18 devices Phone, bed, nurse call	no	yes	yes	option	yes	Dynamic graphic display	Auditory scanning, speech output, serial and relay output. Formerly Solo Act by Taplink.	\$6200
GEWA Control Prog Zygo Industries 800-234-6006 www.zygo-usa.com		Direct Switch: 1 - 2	IR functions: 241 X10 functions: through IR/X10 converter	no	yes	yes	yes	yes	Static overlays	15 levels, keyguard	\$870 425700
GEWA Progress Zygo Industries 800-234-6006 www.zygo-usa.com		Direct Switch: 1 - 2	IR functions: over 100 X10 functions: 256 through IR/X10 converter	no	yes	yes	yes	yes	Dynamic graphic display	Auditory scanning with recorded speech. Different scanning options available. 30 pre-built pages or can customize, various languages, graphics based, can back-up program.	\$5295 4253
Imperium 200H • Basic • With Bed Control • Complete Ablenet, Inc. 800-322-0956 www.ablenetinc.com		Switches: 2	IR functions: 6 devices X10 functions: 256 Integrated phone Bed control and nurse call on 2 nd & 3 rd models	yes	yes	no	Mobile Link option	yes	Dynamic display	Complete version is portable using Mobile Link. Auditory scanning with pre-recorded words for most commands. Bed control and nurse call optional on Basic.	\$3580 86200 \$4200 86100 \$7200 86000
James SAJE Technology 847-756-7603 www.safe-tech.com		Direct Switch: 1		no	yes		yes	yes	Static paper	Row/column or step scanning Levels: paper display must be changed for visual feedback if level is changed Options: telephone, cell phone, bed, lights	\$2000 \$3000 with phone








Chapter 11 - Assistive Technology for Activities of Daily Living



<ul style="list-style-type: none"> Relax II Relax III <p>Ablenet, Inc. 800-322-0956 www.ablenetinc.com</p>		Switch: 1 - 2	<p>IR functions: II: 40, 4 devices III: 30, 3 devices + phone X10 functions: 10 devices through RF</p>	no	yes	no	yes	yes	Text	<p>X-10 radio transceiver required. adjustable scanning (auto, hold, step). Relax III includes IR phone.</p>	<p>\$600 82000 \$1700 83000</p>
<p>Simplicity Switch Quartet Technology 978-957-4328 www.qtiusa.com</p>		Switches: 2	<p>IR functions: 240, 6 devices X10 functions: 64 devices Phone, nurse call</p>	yes	yes	no	no	yes	no	<p>Nurse call option. UL, CSA, CE approved. Speech feedback.</p>	<p>\$call 9164</p>

Voice Access Systems											
Switch back-up access is critical in case voicing is not recognized.											
EADL NAME	PHOTO	ACCESS	CONTROLS	IR		MACR	PORT	BATRY	DISPLAY	COMMENTS	COST/ PROD#
				Stord	Irn	OS	ABLE	BKUP			
POWERHOUSE Home SAJE Technology 847-756-7603 www.saje-tech.com		Switch: 1 Voice	IR functions: unlimited X10 functions: unlimited phone	no	yes	yes	yes wirless headst	yes	no	Can use headset for computer voice commands, auditory feedback, 500' range	\$4500
<ul style="list-style-type: none"> Sicare Standard Sicare Light II Ablenet, Inc. 800-322-0956 www.ablenetinc.com		Switch: 1 – 2 Voice	IR functions: Standard: unlimited Light: 7 devices X10 functions: Standard: 256, RF Light II: 4, IR/X10 converter required	no	yes	yes	yes	yes	Dynamic display Large font	Optional IR phone, IR bed control, external microphone, mount. Speech feedback. Standard: 96 words, can customize menus, auditory scanning. Light II: 15 pre-set menus.	\$5700 88450 \$2100 88460
Simplicity <ul style="list-style-type: none"> Voice/Plus All in One(AIO)/Plus Quartet Technology 978-957-4328 www.qtiusa.com		Switches: 1 – 2 (AIO) Voice	IR functions: 240, 6 devices X10 functions: 64 Phone, nurse call	yes	yes	no	yes wirless headst	yes	no	Nurse call option. UL, CSA, CE approved. Speech feedback. Plus model provides full keyboard and mouse control.	\$call 9161/ 9162 \$call 9165/ 9166
VoiceIR Infrared Voice Controller Broadened Horizons 612-851-1040 www.broadenedhorizons. com		Direct: remote Voice: 1 – 4 users	IR functions: 120 X10 functions: through IR/X10 converter	no	yes	yes	yes	yes, limited	no	Optional IR phone, IR bed control, switch output. Limited battery time. Can use one in each room or power off wheelchair batteries.	\$349

Chapter 11 - Assistive Technology for Activities of Daily Living



Computer Access Systems											
EADL NAME	PHOTO	ACCESS	CONTROLS	IR	MACR	PORT	BATRY	DISPLAY	COMMENTS	COST/	PROD#
				Stord	OS	ABLE	BKUP				
Home Automation Packages	Many Home Automation software/hardware packages are available that are primarily designed to set-up scheduled events in the home using X10 technology. Some of these also send IR signals. To control individual devices and functions, the consumer must be at the computer. These are not specifically designed for people with disabilities. Common examples include X10 Active Home, Hal 2000, Home Vision, Home Director and JDS Time Commander.										
CINTEX 4 NanoPac, Inc. 800-580-6086 www.nanopac.com		Computer access method, including voice	IR functions: 416 X10 functions: 255 Phone	no	yes	no	Phone hdset	no	Computer screen	Bed controls and A/C optional. Phone headset options, including wireless.	\$2190 Base C40-30
EADL IR Package RJ Cooper & Assoc. 800-752-6673 www.rjcooper.com		Computer access method	IR functions X10 functions	no	yes	yes	no	no	Computer screen	Option: X10/IR converter and 1 module \$129 Software also runs on some SGDs	HW-4- 6F \$249
MEDIAssistant 200/200V Convergence Concepts 303-907-3050 www.convergenceconcepts.com		Computer access method, touchscreen remote control 200V - voice	IR functions X10 functions Phone	no	yes	no	remte	10-15 minutes	Remote control screen	Remote control is very small	200 \$3200 200V \$4200
MotivAid 908-781-6595 www.motivaid.com		Computer access method, touch screen, voice, switch scanning	IR functions X10 functions Phone	no	yes	no	no	no	Computer screen	Dedicated computer	?
MultiMedia Max Multimedia Designs 888-353-3996 www.multimediasigns.com		Computer access method. Includes Dragon NaturallySpeaking for voice input.	IR functions: unlimited X10 functions: 256 devices Phone	no	yes	yes	no	yes	Computer screen: graphics of rooms	Includes computer, Dragon NS, hardware, software, installation, training, 1 yr. warranty. Optional bed control, thermostat, security camera	\$8995
Progress Star Zygo Industries 800-234-6006 www.zygo-usa.com		Switch scanning	IR functions X10 functions through IR/X10 converter	no	yes	yes	laptop	no	no	Progress dynamic display software uses onscreen graphic displays. Mini Progress Star does not include switch jack.	?
REACH Break Boundaries 513-645-4203 www.breakboundaries.com		Touch screen, voice, head control, switch scanning	IR functions X10 functions Phone	no	yes	yes	yes	yes	12" screen	Can customize screen	\$6400

Speech Generating Devices		
Most high end SGD's send IR signals.		
<ul style="list-style-type: none"> DynaVox M3 DynaVox V/VMax DynaWrite DynaVox Technologies 866-396-2869 www.dynavoxtech.com	Each of these communication devices sends nearly unlimited IR signals. X10 commands can be accomplished with an IR/X10 converter. Each offers a variety of access methods (direct, single and dual switch, joystick, mouse), customizable dynamic displays, auditory scanning for switch access, graphics and speech output. Each learn IR signals and can store macros. Auditory scanning means that the client just has to listen to scanned options, the auditory cue can be customized to the client's needs and no reading or even vision is required. The DynaWrite is a direct access device. The DynaVox V/VMax and the DynaVox M3 have an optional PhoneIT feature for phone control (\$315). The DynaVox M3 is the least expensive option (price listed) and can be used even by verbal consumers to provide reasonably priced switch accessed control of devices in the environment.	\$3285 
<ul style="list-style-type: none"> ECO-14 Pathfinder Springboard Lite Springboard Plus Vanguard Plus Vantage Plus Prentke Romich Co. 800-262-1984 www.prentrom.com	Each of these communication devices sends nearly unlimited IR signals. X10 commands can be accomplished with an IR/X10 converter. Each offers a variety of access methods (direct, single and dual switch, joystick, mouse), customizable dynamic displays, auditory scanning for switch access, graphics and speech output. Each learn IR signals and can store macros. Auditory scanning means that the client just has to listen to scanned options, the auditory cue can be customized to the client's needs and no reading or even vision is required. The ECO-14 has an optional Air Card to allow wireless control of a landline phone. The Springboard Lite is the least expensive option (price listed) and can be used even by verbal consumers to provide reasonably priced switch accessed control of devices in the environment.	\$2195 
Power Wheelchair electronics		
Some power wheelchair electronics packages send IR through the display. Invacare and PG Drives Technology are pending		
Quantum QLogic	The QLogic display (generally ordered when the consumer cannot use a joystick) sends multidirectional IR signals from the back of the display. It can learn up to 288 codes and store up to 3 macros. It can control X10 devices through a converter (4 devices per converter, 256 max.). The consumer uses the directional drive switches to scroll through and choose device and function options.	
Quickie iQ	The iQ display (generally ordered when the consumer cannot use a joystick) sends IR signals from the back of the display. It uses pre-set codes and can learn up to 22 codes. It can control X10 devices through a converter (4 devices per converter, 10 max.). The consumer uses the directional drive switches to scroll through and choose device and function options.	

IR: infrared control of audio/visual equipment, IR phone or other IR controlled device

X-10: on/off control for lights, appliances, fan, buzzer, door opener, drapery control, more. Uses existing house wiring (powerline) and, if remote, radio (RF) or infrared (IR) transmission to a converter.

Insteon: like X10, uses powerline and RF, more reliable, can control more devices. Can be given X10 address.

UPB: like X10, uses single band technology, powerline.

ZigBee and Z-Wave: like X10, single band RF wireless network.









Bed control can be accomplished with 6 X10 signals by X-10 System Electric Bed Operator #304, Jantek Home Controls, Inc., 416-620-5255, \$430.








Bed control can be accomplished with IR signals using the Ablenet IR Bed Control, \$1000.

Door Openers can usually be controlled with an X10 module. If the EADL is not portable, you cannot open the door from outside. IR Door openers are available, as well.

Any EADL transmitting IR may be programmable to send to an IR telephone. Check with the manufacturer.

Michelle L. Lange, OTR, ABDA, ATP, Access to Independence, MichelleLange@msn.com, 7/08.

BASIC ELECTRONIC AIDS TO DAILY LIVING – Battery and Simple Electrical Devices											
NAME	PHOTO	CONTROL MODE				SWITCH	SWITCH	COST	PROD. #	DIMEN	COMMENTS
		Direct	Latch	Time sec	Time min	INPUT	OUTPUT				
Battery Transmission											
Single SLAT Ablenet			X	0 - 60	0 - 60	1	1	\$75	100- SSLAT	2.25 x 3.75 x 1	
Choice SLAT Ablenet			X	0 - 60	0 - 60	2	2	\$95	100- CSLAT	2.25 x 3.75 x 1	2nd device will not activate until 1st device stops
Dual SLAT Ablenet			X	0 - 60	0 - 60	2	2	\$95	100- DSLAT	2.25 x 3.75 x 1	allows 2 people to use at one time
Tash Switch Latch Ablenet		X	X	2 - 52		2	2	\$125	43880	?	
LinkSwitch Adaptivation		X	X	1-60	1-60	1-2	1-2	\$106	DLT-202	3 x 4.5 x 2.5	alarm mode
Switch Scanner Adaptivation		X	X	1-60	1-60	1-2	1-6	\$159	SWSC	5.75x3.75 x 1.25	scans up to 6 outputs
5-in-1 Switch Modifier Enabling Devices		X	X	0-120		1	1	\$89.95	566	6.75 x 2.5 x 1.5	intention mode (adjusts activation time). Includes adj. pressure switch
Switch Modifier Enabling Devices			X	0 - 120		1	1	\$59.95	605	4.5 x 2.5 x 1	

Electrical Transmission											
PowerLink 3 Control Unit Ablenet		X	X	0-60	0-60	2	4	\$189	100-PL3D	9 x 5 ½ x 2 ¼	up to 1700 watts total remote switch access with AirLink (\$89)
Electralink Ablenet		X	X	1-60	1-60	1	1	\$200	34410	?	up to 1500 watts, 15A. Can be used with wireless Ultra One Transmitter
FreeHand Adaptivation		X	X	1-60	1-60	1	1	\$115	FH-ME	3.5 x 3.5 x 3.5	with transceiver module \$145
FreeSwitch Max Adaptivation		X	X	1-60	1-60	1-4	1-8	\$299	FSM-100	4 x 6.5 x 1.8	visual and auditory scanning (speech) X10 modules required Direct access option
Wireless Pal Pad Adaptivation		X	X			1	1	\$95	WPP	3.5 x 4	with transceiver module \$125
1-Switch Single-Appliance Unit Enabling Devices		X	X			1	1	\$107.95	1490	3 x 2.5 x 2	remote up to 600 watts
Environmental Controls Enabling Devices			X			1	4	\$149.95	591	4.5 x 2.5 x 1	Includes 2 receivers. 2 more \$63.95.






Basic EADLs provide direct, latched or timed on/off switch control of battery operated toys or simple electrical appliances. For control of more devices and features, please refer to the Multifunction EADLs chart.

Infrared Transmission							
a. Mini Relax - Scanning b. Mini Relax with Jacks c. Mini Relax with X-10 Ablenet		a. 1 b. 1-6 c. 1	a. 6 IR cmds b. 6 IR cmds, c. 6 IR cmds 1 X-10	\$300 \$325 \$400	82050 82060 82070	6 x 3.5 x 1.5	a. auditory and visual feedback, auto scan b. one switch required for each function c. includes X-10 radio transceiver
Wireless TV Remote Enabling Devices		direct or 5 switches	TV	\$142.95	1521	15.75 x 10.5 x 3.5	2" buttons or any 5 switches to control power, channels, volume
TV Remote Module Enabling Devices		1-5 switches	TV	\$72.95	5150	10 x 4 x 2.5	switch for each desired function: power, volume up, volume down, channel up, channel down

Basic EADLs send a limited amount of infrared signals to a limited amount of devices. For control of more devices and features, please refer to the Multifunction EADLs chart.

Infrared Controlled Telephones

An infrared controlled telephone can be used by virtually any Electronic Daily Living Aid (EADL, formally Environmental Controls) that can send infrared signal. Here is a comparison of features:

Features	GewaTel 200 ZYGO Industries, Inc. 800-234-6006 www.zygo-usa.com	Infrared Home or Office Accessible Landline Telephone Broadened Horizons 612-851-1040 www.broadenedhorizons.com	Prism Prism D Ablenet, Inc. 800-322-0956 www.ablenetinc.com	SiPhone Quickphone Quickphone f Dr. Hein www.SiCare.de (Germany)	TS Phone with TS Controller Technical Solutions 03 9737 9000 www.tecsol.com.au (Australia)
Photo					
cost	\$1,380.00	\$699.00	To be determined	?	\$360 (GST) phone only
access	-IR signal -Keypad	-IR signal -Keypad -Voice with voice dialer	-IR signal -Keypad	-IR signal -Keypad	-Single switch for answer and hang-up only -IR signal with TS Controller -Keypad
user can build #s	Yes	Yes	Yes	Yes	Yes
prestored #s held	50	50	5 speed dial Prism relies on directory in SGD Prism D adds directory of 100	SiPhone 200 Quickphone 50	20
redial	Yes	Yes	Yes	Yes	Yes
call waiting	Yes	Yes	Yes	Yes	Yes
battery back-up	Yes	Yes	Yes	Yes	Yes
Display	Yes	Yes	Yes	Yes	Yes
Volume Control	Yes	Yes	Yes	Yes	Yes

Chapter 11 - Assistive Technology for Activities of Daily Living



Privacy headset	\$115 earphone \$340 microphone	Wired privacy headset \$29.95 Wireless headset \$349.95 Expansion Microphone \$149.95	Pending	Optional	2 Options \$297 or \$498 (GST)
Interfaces	-any learning IR transmitter -any IR transmitting EADL -GEWA Prog	-any learning IR transmitter -any IR transmitting EADL -VoiceIR Voice Controller	-any learning IR transmitter -any IR transmitting EADL -SiCare Standard, Light II, Relax III	-any learning IR transmitter -any IR transmitting EADL -SiCare Standard	-any learning IR transmitter -any IR transmitting EADL
Transmission	Analog landline	Analog landline	Analog landline	Analog ISDN	?
Other	-can be used as standard phone. -commands pre-programmed into Quickie iQ electronics.	-can be used as a standard phone -voice dialer \$249.95 -same base phone as GewaTel 200	-same base phone as Quickphone -Prism D	SiPhone is cordless SiPhone takes pictures, sends via MMS "f" version has emergency call function, requires remote button press -can be used as a standard phone	-can be used as a standard phone

The GEWATel200 and Infrared Home or Office Accessible Landline Telephone are a Konftel 200 phone with remote. These are often available through various internet retailers for a lesser cost.

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Resources List for DL continuums	This is a sample of some resources. It is not meant to endorse any one product over another. It is meant as a starting point when looking for examples.	
Eating , drinking, and Food prep Resources	Nonslip materials- Built up handles, adapted plates, cups, straws	http://www.dycem-ns.com/ http://www.sammonspreston.com/app.aspx?cmd=get_sections&id=100000 http://enablingdevices.com/catalog/useful-devices/household-products
Meal time, cooking, clean-up	Transfer items, carts, tools Simplified cook book	http://www.sammonspreston.com/app.aspx?cmd=get_subsections&id=100844
	Support for kitchen shopping and cooking	http://www.infinitec.org/live/kitchens/Cookshop.html
Electronic feeder	Self feeder	http://www.mealtimepartners.com/
	Picture based cook books	http://picturecookbook.com/ http://www.attainmentcompany.com/xcart/search.php?mode=search
Dressing	Resource with multiple links to adaptive clothing sites.	http://www.familyvillage.wisc.edu/at/adaptive-clothing.html
Hygiene	Assist in toileting Bathing, bathroom supports Oral care	http://www.medicaldepartmentstore.com/Self-Wipe-Toilet-Aid-p/725062000.htm http://www.sammonspreston.com/app.aspx?cmd=get_sections&id=100001 http://www.sammonspreston.com/app.aspx?cmd=get_subsections&id=100831