Stepping Stones to Switch Access
(Summary of Steps)

Step 1: Single Switch - Cause and Effect

- Momentary/direct activation to get started
- Do not use a delay-timer until it is clear that the child understands the cause and effect of the switch. Then, use a delay timer if needed to make the results worth the effort. (You may want to begin sessions with a few minutes of direct activation)
- Short timed segments for more active engagement
- Toys with a mission
- Simple Means-Ends

Step 2: Single Switch - Multiple Locations and Multiple Functions

- Locating a switch in multiple locations
- Developing some motor automaticity, through repetition with moderate differences - without the stress of timing
- Using a switch with clear intent
- General social and pragmatic timing
- Sequenced social scripts

Note: Strive to achieve a balance between leaving a switch in one place long enough for the child to accommodate to it, and experimenting with moving the switch to a place that might be easier for the child to access.

Step 3: Two Switches - Two Functions

- Increase motivation by increasing cognitive engagement and control
- Two switches trial and error
- Two switches positionally related to function (Left Right Switch Activities on this CD)
- Two switches social turn talking
- Two switches / two functions
- Appropriate pragmatic use of function

Examples of Two Switches - Two Functions:

- **Light Tech:**
    - One switch toy and one voice-output device (single message or step by step)
    - Rotating plate activities and voice-output device (single message or step by step)
    - Game spinner switch and voice output
    - One step by step to list choice, one voice-output to say "That's it"
    - Two voice-output devices with different functions

- **High Tech:**
    - One switch computer, one switch related toy or voice-output device
    - IntelliPics - two switches two functions from overlay
    - IntelliTalk 2, PowerPoint, IntelliPics Studio, HyperStudio, BuildAbility or other computer story with one switch, and the other switch can be a voice-output device for repeated line, sound effect, or to comment about the story.

Types of Scanning - to increase choices and control

- Automatic Scanning
- Inverse Scanning
- Step Scanning with a Delay
- 2 Switch Step Scanning
- Morse Code

Why Two Switch Step Scanning?

- Eliminate need for Timing
- Concentration / Distraction
- Allows for more appropriate social skills and pragmatics
- Active vs. Passive Control
- Separate Function for Each Switch: Simple Cognitive Map
- One switch advances scan with each activation, the second switch selects the item.
- Very few options are available for a single switch user beyond cause and effect

Different Cognitive Levels:

- Some children have difficulty moving to two switch step scanning because they do not yet understand the cognitive task. The goal for these students is to provide them with graduated experiences so they can experience success in learning the task of two switch step scanning. These students will go on to Step 4.
- Some Children will understand the concept of 2 Switch Step Scanning, as soon as they are shown how it works. These students will go on to Step 5.
- Some children have difficulty moving to two switch step scanning because of the motor component, even though they cognitively understand the task. The goal for these students is developing and refining the motor skills while maintaining motivation for continued success, so they can use two switch step scanning to learn a variety of curricular content. Go to Step 5 or 6.
- Some children have difficulty moving to two switch step scanning because of passivity and learned helplessness. For these students it is especially important to provide purposeful activities with which they can experience control and success. Refer to motivational factors discussed earlier in this handout.
- Some children have a combination of motor and cognitive challenges and it may be difficult to know if they understand the task or if the motor component is too difficult. The goal is to find motivating activities, tied to what they do understand and

relate to, and then add moderate challenges to gradually increase their skills. These children may benefit from working on Step 4 activities.

Step 4: Learning to Two Switch Step Scan

- One switch is the "mover" or "lister" and one switch is the "get it" or "selector" switch
- Children who don't understand the concept of two switch step scanning, may need this intermediate step to experience one switch as the mover and one switch as the selector.
- These children may appear to activate the two switches randomly and without discrimination of function.
- Use battery powered toys to move to a location for a play purpose. Use a delay timer that moves the toy a short distance for each activation. (rotating plate)
- Provide experiences where one switch moves something on the computer screen and the second switch activates something in relation to where the item has moved. Allow only one switch to work at a time, so that if the child tries the other switch, the natural lack of feedback will direct her back to the first switch. This is in contrast to typical two switch step scanning where the movement on the screen or display is simulated by a light or highlight showing one item after the next. Some children may have trouble seeing this as movement.

Step 4a: Side Step: Single Switch Timing - Following this step may lead to variations of steps 5-8 for automatic scanning, inverse scanning or step scan with a delay

- Some children show an ease of activating the switch that indicates they will be able to activate a switch in a timed mode. For these children, you may want to probe this ability by presenting simple single switch activities that require timing. For example, Frog and Fly by Sim Tech. and other simple scanning games. Experiment with automatic scanning, inverse scanning and single switch step scanning with a delay
- Observe these children closely to make sure they are successful enough to stay actively involved. If they get discouraged, consider going back to two switch step scanning.
- Fatigue is a factor to consider, except for the beginner, also consider that increased active involvement may outweigh the downside of fatigue. Consult the child's OT and PT for help with positioning and switch placement that will reduce fatigue.
- If a child hasn't yet developed enough automaticity for switch activation, you may want to keep them on the path of two switch step scanning, until if and when, they can be more successful with timed activation.
- Children who have good timing skills may follow a similar sequence to steps 5-8, but with the access of single switch automatic scanning, inverse scanning or step scan with a delay.
- Other children may not be ready for a timed form of scanning until step 8, at which time, they may have developed enough motor automaticity with a switch to be successful with timed scanning.
- Some children may always be faster with two switch scanning and never use a timed scanning.

Step 5: Two Switch Step Scan Errorless Learning - any choice works

- This type of activity offers the child a variety of choices through two switch step scanning, but any response is accepted as the child plays or creates a story, rhyme or errorless letter.
- Along the same line, the student can choose verses of a song to be sung in any order.
- Similarly the child can use a series of communication displays to direct the action of another person in a play activity script.
- The child can "scribble" with a talking word processor with a limited set of letters.
- The child can use different computer voices to listen to a selected tongue twister or silly saying.
- The chid can use a communication device to direct action in a game such as follow the leader or draw a face, with options that all make sense.

Step 6: Two Switch Step Scan for Clear Choices: Activities for Increasing Accuracy and Cognitive Engagement

- Insert some blanks in the array of choices with a communication display or software activity.
- Use a word like "click" or "nothing" repeatedly and have the child listen/look for a target word such as: "read", "sing", or "show me!" Vary the number of clicks each time.
- When the child selects one of these choices, the feedback shows that it is somehow not logical or not reinforcing. Hopefully the child will not select that item again, and pay more attention to selecting a fun or appropriate choice.
- Use partner assisted scanning and model self-talk, "hmm, no, no, yes, that's what I want"
- The number of blanks or clicks before a target item, should be varied to prevent the child from just learning a motor pattern, instead of staying cognitively engaged to make a clear choice.
- Gayle Porter's light tech multi-page dynamic displays more info at: http://www.lburkhart.com/hand_design_auditory_syst.htm
- Aided Language Stimulation in visual and/or auditory scan mode
- Try adapting two switch step scanning access to commercially available mouse activated software games that respond to a child's choices. These are great for practice and motivation. For example CD Juke Box. (Clickit)

Step 7: Practice for Increasing Accuracy with Two Switch Step Scanning

- There are an endless variety of activities that can be set up to give children experience with two switch step scanning using authoring programs and communication devices.
- Try activities with some correct answers and some incorrect answers
- Add slightly negative or illogical items in the array of choices, or simply "no" and repeat what to listen/look for.
- For communication displays, select vocabulary items that have different pragmatic intents, so that the responses from the listeners provide clear feedback for the child's

comments.

- Once the child understands the process, then two switch scanning can provide an access strategy to many curricular applications as well as a means of communication. Music, animation, and logical or humorous sequences are often a good starting place.
- Use errorless activities, like step 5, however, now create them with options that allow the student to make choices that are more logical, or show more personal opinion than others. At this step, the child will be putting more conscious effort into creating and generating his or her own ideas with these errorless activities. Include the child in determining which choices to include in these activities, such as errorless letters.
- Provide emerging literacy activities for creating stories, playing with sounds and letters, or constructing a rhyme or sentence.
- Keep motivation high and customized for the child.
- With successful and motivating practice, the child will be developing more motor automaticity, and integration of cognitive and motor tasks.

Step 8: Two Switch Step Scan Reducing Time for Success

(for children who understand the process of two switch step scanning, and have developed some motor automaticity for the task)

- Present a limited array at appropriate times to increase efficiency (combining letters with word endings)
- If the child is just spelling out a controlled set of words, it may be faster for the child to be presented with only the possible letters instead of the whole alphabet array.
- If the child is creating sentences, selected words can be offered, instead of the child having to spell out each word.
- Make use of sentence starters, endings and phrases.
- Use the feature of natural branching to present a limited number of choices at each logical step of a discussion, sequence of activity, composition or story. (For example: the next logical vocabulary needed in a sequenced type activity, automatically appears, instead of having to be navigated to from the main page.)
- Set up the array so that incorrect pictures or items disappear after one selection.
- Provide practice for rehearsing or studying for a test in a child-controlled flash card format.
- Provide multiple choice instead of fill in the blank activities.
- Provide feedback in the form of a voice-output/written explanation for illogical choices.
- Utilize electronic "Word Walls" and "Word Banks" to provide access to frequently used words.
- Consider using word prediction or picture/word prediction.
- Consider using encoded alphabet displays for spelling.
- Explore other switch access strategies, such as Morse Code.

Two Switch Step Scanning - Some Points of Clarification

Important Notes:

- Two Switch Step Scanning provides a means to give the child control over more than 2 choices, by using two switches, one as a mover/lister and the other as the chooser/picker
- It has been around for a long time, however, the technology for its effective use is not always available in devices and in software
- The term two switch step scanning has many different definitions depending on the manufacturer or developer and may not work in the desired manner for the most efficient use by the child on a particular device or within a particular piece of software

Definition:

One switch advances the scan to the next item. To advance to the next item, the switch must be released and activated again. This should occur immediately in synchronization with the child's movements, even if the auditory prompt has not finished playing. Once the desired item is reached, a second switch is used to select it. Length of time on and off the switch does not effect correct responses and there is no timing involved. This should not be confused with inverse scanning or step scanning with a delay, both of which require an element of timing and are not the subject of this discussion.

Technical Points for Two Switch Step Scanning:

- In two switch step scanning, One switch moves the cursor, light or highlight from one item to the next. The second switch activates the item that is currently highlighted.
- Reactivation of the switch interrupts the auditory prompt, and moves to the next item in real time.
- Another feature to look for is the option to set a "bounce" or delayed acceptance time. The feature would have a setting not to accept another switch activation for a specified fraction of a second or so - depending on the child's physical abilities.
- A critical feature that should be considered is that the switch be required to be released and then reactivated in order for the scan to move to the next item.
- Two switch step scanning should allow for item by item scanning, even with multiple palettes/toolbars. Group/item or row/column scanning can be very difficult for the beginning two switch step scanner.

NOTE: Automatic scanning should be considered for any child who does not have trouble activating a switch on cue-consistently throughout the day and in a variety of environments (including busy classroom). Two switch step scanning should be considered for children who have difficulty timing a switch activation and/or are easily distracted.