

Part I:

Background Information

Television/VCR Repair Case Study

BACKGROUND

Over 40 years ago, while only a junior in high school, a diving accident left James Register a quadriplegic. After graduating from high school he took an 18-month correspondence course in radio and TV repair. Upon receiving his certification, James opened his own repair shop with financial assistance from the Department of Rehabilitation Services. Over the years he developed a steady business but as the business grew, he began having difficulty keeping up with his workload and became increasingly dependent on the assistance of others to maneuver and disassemble the larger TVs, set up tools and test equipment and help with paperwork.

In the meantime James married, had 2 children and while later divorced, raised both his son and daughter. His daughter performs office management functions at his repair shop, located across the street from his home. He “commutes” 100 yards each morning in his power wheelchair, which does require crossing a fairly busy street, with no light for assistance. He now lives with his mother but is able to perform the majority of self-care.

FUNCTIONAL CAPACITIES/LIMITATIONS

James is a wheelchair user and has the following functional capacities:

Cognition: James’s cognitive function is unaffected.

Sensory: Both visual and hearing capacities remain intact.

Speech: Speech is unaffected.

Upper Extremity Function: James is functioning as an incomplete quadriplegic at the C5 level with more left upper extremity than right. He has good shoulder movement in his right shoulder but no fine motor coordination. However, his left shoulder range of motion and hand dexterity is close to normal and he has learned to write with his left hand.

Lower Extremity Function: James requires the use of a power wheelchair. He is able to sit up for approximately 8 hours and typically works 40 plus hours per week, usually spread out over 6 days instead of 5. He often returns to the shop in the evening and maintains flexibility in his schedule, given the nature of the work and his self-employment status.

JOB DESCRIPTION

The Dictionary of Occupational Titles classifies television repair as Medium, with lifting and carrying up to 50 pounds. A repairer uses hand tools and electronic testing instruments to repair and adjust television sets, tuning the receiver on all channels and observing audio and video characteristics to locate the source of trouble. Controls are adjusted to obtain the desired density, linearity, focus and size of picture. He examines the chassis for defects and tests voltages and resistances of circuits to isolate defect, following schematic diagram and using voltmeter, oscilloscope, signal generator and other electronic testing instruments. Tubes are tested and changed if necessary and loose connections must be soldered, replacing defective parts, using hand and soldering tools.

Additionally, as shop owner, James must supervise and coordinate the activities of the other repair staff, deal with customers, make estimates regarding costs and timeframe, order parts, supplies, and updated blueprints, ensure quality of all work, keep all business records, and interview, hire and train his staff.

Essential Functions of the Job

1. Provide customer service when taking orders and giving estimates.
2. Complete paperwork and invoices on all repairs and estimates.
3. Disassemble the TV to determine type and extent of defect.
4. Set up and operate diagnostic equipment.
5. Access information on TV models from reference materials in books and on microfiche.
6. Repair equipment using hand tools and electronic equipment.
7. Complete all paperwork, including business records and payroll.

EMPLOYMENT CONSIDERATIONS

James had been in business for several years but, as noted, an increase in business resulted in greater dependence on his employees. Assistance was needed in maneuvering and disassembling the larger TV's, setting up tools and test equipment, and helping with paperwork. This was due, in part, to the arrangement of the repair shop and the limitations of the work environment. The workshop was extremely cluttered and unorganized, with both the equipment to be repaired and the tools difficult to access. His workbench lacked convenient storage areas for organizing his tools and test equipment. From his wheelchair, James could not reach spare parts and catalogs. A great deal of effort was necessary for him to simply retrieve tools, set-up diagnostic equipment, and maneuver the television sets into place, before any repair work could begin.

James also lacked the financial means to keep up with advances in high tech diagnostic equipment and time saving tools. He had difficulty using some hand tools, particularly screwdrivers. Every repair job involves the removal and replacement of dozens of screws, which is impossible without a cordless battery-powered screwdriver. With all his fine dexterity in his left hand, he generally supported the work with his right and manipulated various tools with his left hand. Because it requires fine motor control from both hands, even with a cordless screwdriver, grasping the tool and activating the switch took great effort.

Despite these difficulties, James was determined to keep working. The State Rehabilitation Agency requested assistance from the Georgia Tech Center for Rehabilitation Technology (CRT) to evaluate and recommend changes to his work environment. Alan Harp and two other rehab engineers from CRT spent a day with James to evaluate the worksite.



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