

Higher Technician Sales – A Diagnostic Approach

Presented by James R. Leichter

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James R. Leichter

President & CEO, Aptora Corporation, Mr. HVAC LLC, RA Tax and Accounting Inc., Founder of Black Belt Contracting.

James is a successful entrepreneur and master mechanic whose accomplishments include being the founder of MrHVAC.com, the CEO and founder of Aptora, the President of RA Tax and Accounting and a partner with ProAmerican Investments.

James' company MrHVAC.com is a website dedicated to improving the lives of contractors. It includes industry articles, specialized HVAC calculators, forms, templates and one of the most extensive operations manuals in the country.

As the founder of Aptora corporation, he has created some of the most popular software programs in the service industry including Flat Rate Plus® and Total Office Manager®.

James is well known for his burning passion to help contractors and it shows in his unique speaking style. He has hosted management workshops all around the United States and has conducted onsite consulting since 1996 with hundreds of contractors.

MrHVAC.com

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Companies**

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Service Department Profitability?

How do we know if our service department is losing money?
We need departmentalized income statements!

- Residential
 - ☐ Demand Service
 - ☐ Replacements
 - ☐ Service Agreements
- Commercial
 - ☐ Demand Service
 - ☐ Replacements
 - ☐ Service Agreements



Review Your Productivity

- Sales Per Person: _____
- GP\$ Per Service Tech: _____
- GP\$ Per Install Tech: _____
- Non-Billable vs. Billable Employees: _____



Defining Your Service People

Few service people are true technicians. There are generally four types of people that perform service calls.

- Parts Changers
- Troubleshooters
- Technicians
- Master Technicians (Master Mechanic)

Judged By How We Speak

The military, police and other emergency services have their own vocabulary.

So do all other professional industries. Examples include architects, engineers, scientists, doctors, and more.

To be professional, we must first look professional and then sound professional.

We are truly judged by how we look and then how we sound.

A full sheet is at www.mrhvac.com

HVAC GRAMMAR SCHOOL

Forbidden Words & Phrases

Air-Cleaner
Bid
Boss
Buy/Purchase
Cash On Delivery
Change-out
Checked
Clean & Tune/Check
Credit Application
Contract
Customer
Deal
Dispatcher
Down Payment
Employee
Excuse
Fixed
Girls in the Office
Heating & Cooling System
Humidifier
Insulation (duct)
Installer
Invoice
Maintenance Contract
Maintenance Guy
Manager [Department]
Monthly Payment
Objection
Oil
Options (IE: humidifier)
Owner
Parts Runner
Price or Total Price
Problem
Put It Back
Repairman
Sales Call
Salesman
Serviceman
Signature
Thermocouple
Work For
Work (IE: "Do the work")
Your Price/Cost

Suggested Alternatives

Air Filtration System (Air Purification)
Proposal
(Don't ever say "boss")
Own
Cash on Completion
Replace
Inspected and Tested
Precision Tune-up
Account Application
Agreement
Client
Opportunity
Production Coordinator
Initial Investment
Co-Worker
Explanation
Resolved
Customer Satisfaction Representative
Comfort System
Humidification System
Acoustical/Energy Lining
Installation Technician
Technician's Report
Safety & Efficiency Agreement
Precision Tune-up Specialist
Department Leader
Monthly Investment
Concern
Lubricate
Comfort Enhancements
President
Material Handling Specialist
Investment or Total Investment
Challenge or Situation
Replaced It
Technician
Presentation
Systems Consultant
Technician
Approval
Pilot Safety
Work With
Procedure
Your Investment

Your vocabulary, the words that you use, can be a very powerful tool. Don't ever assume that our customers are technically inclined like us. Use simple, non-technical, easy to understand language, to make your point.

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The Phonetic Alphabet

The military, pilots, police and other emergency services use a standardized method of calling out letters. This is known as the “Phonetic Alphabet”. Its use improves efficiency, helps assure understanding, and adds a higher level of professionalism to the service technician.

Alpha	Golf	Mike	Sierra	Yankee
Bravo	Hotel	November	Tango	Zulu
Charlie	India	Oscar	Uniform	
Delta	Juliet	Papa	Victor	
Echo	Kilo	Quebec	Whiskey	
Foxtrot	Lima	Romeo	X-Ray	



Advanced Diagnostic Tools

In addition to the common tools you may already own, we recommend that you also acquire some specialized tools.

1. Vane Anemometer
2. Wet Bulb/Dry Bulb Digital Thermometer
3. Digital Refrigerant Gauges with Remote Temperature sensors
4. Combustion Analyzer
5. Carbon Monoxide Detector
6. Digital Manometer
7. Air Quality Analyzer
8. Megohmmeter
9. High Quality True RMS Multimeter
10. ESR Capacitor Tester



Calculating A\C Performance

Calculate BTU Removal Per Hour

The capacity of an air conditioning system is usually measured by determining how many BTU's of heat a system can remove per hour of continuous operation.

By taking the time to calculate system capacity and efficiency, you will know definitively if the system is operating correctly.

Even if the system is operating at near 100% of its design, we still need to perform a thorough evaluation of the system and each of its components.



Use a Megohmmeter

- Test motors, pumps, and circuits.
- Test grounding systems
- Analyze motors and controls
- ALWAYS test compressors BEFORE performing major work. You don't want to cleanup a system, fix leaks, charge it, turn it on, and find out the compressor failed.



Megohmmeter Basics

MEGOHMMETER - A meter capable of measuring resistances greater than 200 megohms.

- Regular ohmmeters typically measure less than 200 megohms.
- Megohmmeters generate high voltage, low current signals for testing the integrity (breakdown strength) of electrical insulation.
- They are called megohmmeters because the insulating resistance of a properly designed product is expressed in megohms (MO).



Using the Megohmmeter

- Test insulation resistance of motor wires and windings by using megohmmeter between T1, T2, & T3 leads. Each reading between phases should be within one or two ohms of each other; A to B, B to C, A to C.
- Use megohmmeter to test insulation resistance to ground of motor windings on 500-volt scale; minimum reading is 1000 ohms of resistance per volt of incoming power that motor will be connected to.
- Test motor for resistance to ground with megohmmeter, if reading is below 500,000 ohms, motor is grounded and must be replaced.



Using the Megohmmeter

Test Wires and Grounding Systems

- Be sure all power supplies are off and secured.
- Touch either of the megohmmeter's leads to the ground being used for that electrical system. For example, if the system you are testing is a condensing unit, connect a lead to the cabinet itself, since it is grounded.
- Touch the other lead to the copper wire you are testing.
- Anything reading between 2 megohms and 1000 megohms is usually considered a good reading. Anything less than 2 megohms indicates an insulation problem.
- This process can be used to evaluate almost any high voltage circuit.



Use a CO Detector

- ALWAYS test outgoing air at the plenum and various air vents.
- Be sure your CO detector is in good working order and have it calibrated per manufacture's recommendations.
- WARNING: NEVER use a CO detector to PROVE a furnace is SAFE. Use a CO detector to prove the furnace is UNSAFE.

Tip: Test the furnace when it is cold and when it is hot. Be sure furnace has been operating for at least 15 minutes. You need the heat exchanger to be hot.



Use a Combustion Analyzer

- Test flue emissions for correct CO levels. Adjust burners and/or combustion air as needed.
- Measure Oxygen (O₂) and Carbon Monoxide (CO).
- Calculate COAF (CO air free) and excess air (EA).

Tip: Test the furnace when it is cold and when it is hot. Be sure furnace has been operating for at least 15 minutes. You need the heat exchanger to be hot.



Use an Air Quality Analyzer

- Measure and Document
 - Carbon Dioxide (CO₂),
 - Formaldehyde (HCHO)
 - Volatile Organic Compound (TVOC)
 - Particle Matter (PM_{2.5}/PM₁₀)
- Always test outgoing air at the return intake, plenum, various air vents, and most rooms.

Tip: Test the furnace when it is cold and when it is hot. Be sure furnace has been operating for at least 15 minutes. You need the heat exchanger to be hot.



What is a True RMS Multimeter?

RMS stands for Root Mean Square and TRMS (True RMS) for True Root Mean Square. The TRMS instruments are much more accurate than the RMS when measuring AC current.

True RMS responding multimeters measure the "heating" potential of an applied voltage. Unlike an "average responding" measurement, a true RMS measurement is used to determine the power dissipated in a resistor. The power is proportional to the square of the measured true RMS voltage, independent of waveshape.



Use a True RMS Multimeter

- Test switches, contacts, disconnects, etc. for electrical resistance. They should read 0.08 ohms or less.
- Test and record motor voltage balance. An imbalance can cause higher than acceptable operating temperatures. Voltage difference between poles should not exceed 1%.
- Test for adherence to nameplate voltage while motor is running. Voltage variation should not be below 90% or exceed 110% of nameplate.
- Measure and record no-load voltage at the breaker and then measure full load voltage at the motor or compressor.



Electrical Component Replacement

- Recommend replacing any silver coated contact that shows signs of pitting or corrosion. This includes switches, relays and especially contactors.
- Recommend replacing any terminal or electrical connection that shows signs of high heat, corrosion, pitting, or wear. Don't forget to inspect compressor terminals, fuse boxes, and breaker seats.
- Recommend replacing any motor that shows clear signs of high continued operating temperatures.
- Recommend replacing any motor or pump whose bearings indicate signs of wear or unacceptable mechanical 'play'.



Electrical Component Replacement

- Recommend replacing fuses that appear to be in poor condition.
- Open up breaker panels and side panels. Verify correct wire\breaker size. Verify one conductor per breaker. Tighten all electrical connections. Inspect seats. Verify proper grounding. Verify that the furnace and a/c have their own dedicated circuit.
- Inspect beaker switches for signs of high heat. Replace breakers that are suspected of being 'weak'; especially when they are more that ten years old.
- Carefully inspect and test all electrical systems and ALWAYS seek permission before replacing.



Identifying Code Violations

Service technicians need to be familiar with all local and national codes related to their job.

- Condensing Furnace Flue Pipe Assembly
- Non-Condensing Furnace Flue Pipe Assembly
- Gas Piping
- Electrical Grounding and Isolation
- Electrical Safety Disconnect Switches
- Breaker and Fuse Sizing
- Duct Fasteners
- The list goes on and on . . .



Other Repair Opportunities

Service technicians must look for other legitimate repair opportunities that others might miss.

- Replace leaking Schrader valves and replace missing or improper service valve caps.
- Don't forget the humidifier - even in the summertime. Replace bad Saddle Valves. Water panels should be replaced each year.
- Repair or replace condensate and other drain lines. Recommend the replacement of any non-PVC drain assembly.
- Upgrade thermostats – even at lower profit margins.

Tip: All of this is very difficult when quoting a client “risky” time and material pricing. Flat rate users will notice sales of “extras” will increase significantly.



Conduct Regular Training

Regular, well thought out, consistent training is an absolute must if you are going to have a successful service department.

- Weekly meetings on various service-related topics.
- Thirty minutes each.
- No management or HR issues are discussed.
- Everyone gets paid.
- Everyone shows up on time.
- Start and stop on time.



Dispatching Service Calls

General Tips

- Dispatch technicians from their home to the first call of the day.
- Send all contact information, nature of trouble, and method of payment.
- Dispatch one call at a time. Schedule four per day. Don't bother the technician while on the job.
- Technicians must keep office informed of progress and advise if the call will take over 1.5 hours (residential - working time). Commercial work and geographical considerations may change this time.



Tech Training: Service Call Preso

Arriving at the Client's Home

- The technician should be properly uniformed according to current company policy.
- When parking your vehicle, never park your vehicle in the client's driveway. Your truck should be clean and properly lettered according to company policy.
- Park your vehicle on the street, locating it so the client can see it from their front door. This eliminates the chance of automobile fluid staining their driveway, and you never know who will be pulling in or out of the client's driveway or who's parking spot you'll be taking.



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Approaching the Front Door

- You will need to take business cards, shoe covers, a clean piece of carpet (e.g.: plain door matt), a flashlight, tool container (toolbox, tool bag, tool belt, etc.), service invoice, and a flat rate price book.
- When approaching the client's front door, never walk across their lawn. Always use cement-paved pathways, don't walk on flowers or bedding!
- Double-check your appearance. Be certain that your shirt is tucked in. If you're wearing sunglasses, remove them. Do not chew gum or tobacco while on client property. Follow company policy.



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Approaching the Front Door (continued)

- Approach the door and set your toolbox down on your right, approximately 4 feet in front of the door. You want your toolbox to clear a standard 36" door when opened for entry.
- Open the outer door (if any) and KNOCK 3X. Always KNOCK, do not ring the doorbell (use the doorbell as a last resort). You may awaken a sleeping child or an ill family member if you ring the doorbell.



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Approaching the Front Door (continued)

- Step back, away from the door, approximately 4 feet (you should be parallel with your toolbox). This allows the client to completely see your upper torso when looking through their peephole or window.
- The visual picture the client should see when they open the door is a clean-cut service technician, wearing a clean uniform with a photo ID badge. The client should also be able to look over the technician's right shoulder and see a clearly marked service vehicle parked at the curb.
- Have a business card in your left hand, with the logo facing up.



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Approaching the Front Door (continued)

- When the client answers the door, introduce yourself, using your first name only. Identify the company you're with and why you're there.
- Hand them the business card with your left hand. Your right hand should always remain free, in case the client offers to shake your hand. Never offer to shake a lady's hand, but politely do so if she extends her hand. Your handshake should be less aggressive than theirs.



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Entering the Residence

- Wait for the client to invite you into their home, or ask “May I come in please?” Put on your shoe covers, pick up your toolbox, and enter their home.
- NEVER place your toolbox on any type of floor. Do not place on carpet, vinyl, tile, hardwood, plywood or cement. Instead, carry a small piece of carpet with you, place the carpet on the floor and then place your toolbox on top of that. An inexpensive, welcome-type mat is a good solution.



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Beginning The Service Call

- Use this opportunity to ask your client some important questions:
 - ☐ How long have they lived at the residence?
 - ☐ How long do they plan to live there?
 - ☐ Confirm with them the problem you're here to diagnose (example: "The office indicated that your toilet is leaking?").
 - ☐ Allow the client to explain the problem in their own words.
 - ☐ Is there anything their system doesn't do that they wish it could?
 - ☐ Ask about service history on the equipment.



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Beginning The Service Call (continued)

- Let the client know that you're going to get to work by testing their complete system and that once you have concluded what the problems are, you will report back to them with all the details.
- Assure them that absolutely no repairs will occur without their express prior approval.



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Initial Invoice Preparation

- Once you've determined the service problem, document the problem on the invoice. Be sure to list the following:
 - ☐ The task number
 - ☐ The task description
 - ☐ The client's total investment for repairs
 - ☐ Mandatory and/or highly recommended repairs
 - ☐ Optional repairs and/or upgrades as needed.

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Explaining The Fees

- Ask if they own a SEA. “I just wanted to see if you qualified for the <callout the dollars and cents> discount”.
- I will replace your “contactor” for a total investment of \$_____.
- Once that work is complete, I’ll run your system for approximately fifteen minutes. That will allow me to conduct the rest of the diagnostic process. Nothing else happens without your approval.



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Explaining The Fees

- If additional repairs are needed, quote them.
- Sell extra services. There are plenty of legitimate repair opportunities out there.

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