

- » 21 years in IT + 8 years broadcast engineering
 - » Easy-going, fast learner, self-starter, strong communicator
 - » Well-suited to smaller organizations - wide skillset, flexible, inventive, thrifty
 - » Enjoy technical challenges, solving problems, creating solutions
 - » Dedicated to keeping the stations I maintain operating at their peak
 - » Always hold my work to high standards... every project solid, reliable, well-thought-out, easy to expand and repair, and aesthetically pleasing
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SUBARCTIC MEDIA, Broadcast Engineer

Mankato, MN

5 clusters - 19 stations, 8 translators, and one satellite network - spanning Southern Minnesota 2020-present

After wrapping up a successful TV facility transformation, I looked to radio for my next broadcast adventure. Mankato, Owatonna, Rochester, Fairmont, and Marshall - repairs and modernization "one bite at a time".

- » Handled a wide variety of engineering and IT duties
 - I was one of two engineers at the company; all technical needs were divided between us
 - Operated in a primarily autonomous, project-oriented role, while also addressing urgent needs
 - Tasks included all aspects of studios, transmitter sites, uplink/downlinks, etc.
- » Maintained, monitored, and repaired broadcast transmitters and related equipment
 - Did periodic maintenance, 24/7 response, planned upgrades/changes, and occasional new builds
 - Worked with many Nautel and Harris/GatesAir transmitters, along with a variety of legacy units
 - Planned and deployed a variety of STLs, including redundant setups, and those incorporating IP
 - Brought IP to every site I possibly could; designed a software-based remote telemetry/logging/alerting system to assist in site monitoring (using SNMP where available, and legacy protocols where not)
 - Provided my own RF test equipment, including spectrum analyzer and network analyzer, for diagnosis of various transmitter and antenna situations, as well as making periodic observations
- » Worked to modernize studios, with maximum impact from limited resources
 - Example: Obtained a quantity of older SAS gear from a large corporate broadcaster; meticulously restored, used as the centerpiece of a complete upgrade of the five-studio Owatonna cluster
 - New furniture (custom designed, built via barter w/ local cabinet shop)
 - SAS Rubicon control surfaces (each of which I tore down and refurbished to like-new)
 - SAS 32KD router and RioLink studio engines (upgraded to latest "everything")
 - Built all router, surface, logic, etc. configs from the ground up; developed custom soft panels
 - Planned and installed all wiring (576 channels of discrete audio, plus serial, GPIO, etc. etc.)
 - Trained staff, handled cut-over duties, and oversaw a smooth transition
 - Redid the cluster's IT infrastructure to meet current needs, wants, and best practices
 - Installed second-hand Cisco switches; divided the network into multiple subnets/VLANs with access between them limited as appropriate
 - Implemented pfSense for edge routing, firewall, VPN, etc.
 - Deployed VMware ESXi on used HP server hardware; migrated various processes to VMs
 - Set up Nagios for monitoring, including writing custom scripts to check various broadcast gear
 - Wrote custom RDS middleware for gathering/formatting data and feeding a mix of encoders
 - Also migrated the cluster from SS32 to iMediaTouch (did lots of custom integration work!)

- » Created new opportunities for content sharing and program syndication
 - Example: Transformed local talk show “AI in the Afternoon” to a regional, satellite-distributed program
 - Built new studio at AI’s residence, using various leftover hardware from throughout the company
 - Implemented Rivendell open-source automation, which handles all playout, keeps AI on time, and controls triggers for localization (all running on hardware recycled from previous upgrades)
 - Set up distribution via the company’s satellite network (including creation of a custom audio/GPIO switcher for the project), as well as IP backup using Barix hardware
 - Provided support to affiliates... ensured tight, local-sounding implementation every time!
- » Improved performance in challenging situations with custom equipment
 - Example: “Green Machine” audio processor/stereo generator/stream encoder units
 - Bought retired Linear Acoustic TV audio processors for pennies on the dollar
 - Modified their hardware and software to create a unit which looks and operates much like an Omnia 7, but with much higher I/O density (8 stations in 2RU), and many unique features
 - Completed units distinguished by an ‘exclusive’ metallic green finish and custom nameplate
 - Deployed (with rave reviews and excellent performance) on-air at KXAC, KRRW, KEMJ, KARZ; streams for KATO-FM, KXLP, KDOG, KTOE, KFSP, KOWZ, KRUE, KFOW, KNXR, KFMC, KSUM

UNITED COMMUNICATIONS (*later Gray Television*), Chief Engineer

12 KEYC-TV Mankato • 7 KMNF-LD Mankato

Mankato, MN

2015-2020

A family-owned heritage station serving southern Minnesota - consistently #1 in the ratings, but struggling with technical issues when I arrived. My charge was to stabilize, then modernize, with limited resources.

- » Handled all engineering and IT duties
 - Led a team of three engineers; reported to general manager and station ownership
 - Duties included maintaining all aspects of the station’s studios, transmitter sites, etc.
 - Responsible for non-stop operation of the station’s CBS, FOX, NBC, and CW channels
 - Ensured technically flawless production of 24.5 hours of local news per week
 - Handled all technical needs for the stations’ 60+ employees
 - Communicated directly with the public to assist viewers with issues
- » Led the charge towards technical stability, consistency, and reliability
 - Cleaned up, organized, and reconfigured existing gear to make it “be all that it could be”
 - Added redundancy in key areas - playout, graphics, encoding, transport, transmission
 - Ensured FCC compliance; corrected EAS issues, worked to create top-notch closed captioning
 - Built the station a proper IT infrastructure from the ground up, using second-hand hardware and open-source software where suitable to minimize costs; implemented virtualization to replace their many old/ailing servers; built firewalls, VPN system, etc; deployed fast and secure Wi-Fi, etc.
 - Worked tirelessly to achieve equipment reliability... zero transmission faults since 8/14/15; record of successful spot playback and successful newscast completion is likewise excellent
- » Maximized the impact of the station’s resources
 - Upgraded the station’s encoding chain with Harmonic Electra units; used VBR and statmux to move their FOX subchannel to HD without impacting other services
 - Installed Pelco high-definition IP PTZ cameras at scenic locations throughout the area; used Ubiquiti microwave IP gear to connect them to the studio, BrightSign boxes as receivers, and a home-made recorder and time-lapse generator
 - Moved several MMJs onto Panasonic AC30 cameras, delivering major cost savings while maintaining good picture quality; refurbished their old HPX370s and used them to upgrade “Bandwagon” (a locally-produced, 30-minute long, weekly live music show) to HD and tapeless capture
 - Purchased and combined two Larcan solid-state analog transmitters to create a digital backup rig

- Created shared storage for news and production using second-hand servers, new hard drives, and FreeNAS software; supplied 298TB of storage for \$16K, achieved actual throughput of over 700MB/s over 10 Gigabit Ethernet
 - Made extensive use of Linux, Apache, MySQL, etc. for backend tasks; implemented Nagios as a equipment monitoring/alarm system; deployed osTicket for discreps and general problem reporting
- » Created many in-house projects to extend the station's capabilities
- Designed and developed a custom video logger; it stores 12 months of video from all channels, plus two weeks' worth of raw transport streams, extracts captions for full-text search, etc... and runs on inexpensive, commodity hardware
 - Deployed CasparCG on standard PCs with Blackmagic video I/O; wrote additional software so that it could be used as a backup news playout server, master control CG (NewsTicker replacement), talent-driven elections data display system, other functions too numerous to list
 - Built a virtualized PBX using Asterisk, then deployed IP phones and moved to VoIP phone service; developed many custom telephone features to suit the station, plus applications such as a software-based Weatherline replacement
- » Planned, oversaw, and worked hands-on to replace and automate master control
- Created written plans, budget, etc. and began the bidding process in spring 2018
 - Building renovations took place fall 2018 - oversaw contractors who knocked down walls to create new control space and expand the station's rack room, finished the spaces, expanded electrical and HVAC capacity, etc; juggled equipment and on-air functions to make it all possible
 - Worked with integrators throughout winter 2018/19 to install, deploy, and transition the station onto Harris/Imagine ADC automation and Nexio playout, Telestream Vantage ingest / transcoding / segmenting, Ross Ultrix routing and MC1 switchers, and countless other items
- » Moved, upgraded, and converted translator to LPTV; launched new affiliations
- Translator had been displaced and was under STA to remain dark
 - Worked with consulting engineer to design a facility (channel, height, power, pattern, location) which would cover the core of the market, using the station's primary tower
 - When the construction permit was granted, only 90 days remained before the translator would have been dark for one year, and would therefore lose its licence as a matter of law
 - Quickly designed a plan to use available equipment to build a temporary facility at the new site, on the new channel; worked with consulting engineer again to get STA for reduced height and power
 - Drove across several states to expedite repair and tuning of a spare mask filter I intended to use for the project, by hauling it to/from the manufacturer myself
 - Built out the temporary facility, tested without issue, and signed on with over three weeks to spare
 - Later built out the permanent facility (Ch. 7, 3kW @ 972'), providing coverage as predicted
 - Ran technical efforts to create and launch two new channels on the station (affiliated w/ NBC, CW)

LAKES MEDIA FOUNDATION, Engineer, etc.
103.5 KCIZ-LP Brunswick / Mora

Mora, Minnesota • 2013-present

After years of servicing local AM and FM stations, I took this opportunity to build one from the ground up. Despite being built on a budget of only \$15K, this station's facilities are among the best in its market.

- » Played a key role in getting the station on its feet
- Handled all legal, research, planning; applied for and received license for new station without issues
 - Led multiple successful fundraisers, grant applications, donor presentations, equipment drives

- » Designed the transmission site, coordinated the build, and worked hands-on
 - Negotiated donation of a disused 120' self-supporting tower; coordinated the teardown process
 - Worked alongside local crew to design and build tower footing, and to erect tower at the new site
 - Riggered and installed the antenna system, feedline, and lightning protection equipment
 - Compiled and installed complete transmission chain - was solely responsible for all RF equipment
 - Built the station's on-air audio processing (based on Stereo Tool) to create its "signature sound"
- » Handled all aspects of designing and building out the studios
 - Designed custom studio furniture; had it built by a local cabinetmaker
 - Did all planning - tied together many varied and dissimilar pieces of equipment in a coherent fashion
 - Refurbished oddball PR&E Integrity digital consoles (circa 1996) to working order
 - Pulled and terminated all the high and low voltage wiring, including data and audio cables
 - Built patchbays to convert the consoles to RJ45 connectors (matches "StudioHub" pinouts)
 - Built and installed the station's VoIP phone system (including custom audio couplers)
 - Integrated several low-cost options for getting remote audio to the studio, both live and recorded
- » Implemented Rivendell (open-source automation system) for live-assist and full automation
 - Installed and configured backend environment under VMware... stable and redundant
 - Orchestrated the loading of over 1,200 musical recordings + metadata into the system
 - Set up hardware and wrote scripts to interface with EAS, consoles, switchers, RBDS generator, etc.
 - Created a workaround for Rivendell's lack of a built-in remote voicetracker, using virtualized workstations, VNC, and AoIP, allowing talent to voicetrack or broadcast live from anywhere
- » Provided assistance with programming and production
 - Recruited lineup of local on-air talent (volunteers!), including several well-known market veterans
 - Researched and created a "soft oldies" format (1,200 songs in rotation, spanning 1962-82)
 - Wrote liners, collected raw material, and created the station's initial imaging package
 - Above all, strived for top-notch quality - making everything tight, professional, and consistent!
- » Designed the graphics, built the websites, set up streaming
- » Took part in creating the station's underwriting program, and countless other projects

KANABEC SYSTEMS, Owner / Technician

Mora, Minnesota • 2000-2015

My owned-and-operated business, which grew up from humble beginnings in a garage, to being a fixture in the community. Well-known for high quality work and reasonable prices, and well-liked to boot!

- » Built and managed all aspects of the business from day one
 - Cultivated my "side-line" into a working business while still in high school
 - Opened the original (downtown) office two months after graduation
 - Kept things growing... a few years later, moved into new space on Mora's main highway
- » Sold, installed, and repaired Macs, PCs, servers, LANs, etc.
- » Designed and installed VoIP systems, especially with Asterisk
- » Built, maintained, operated a Linux-based shared hosting system
- » Did technical work for various local AM/FM stations
- » Largest source of new business: unsolicited referrals
- » Clients ran the gamut: agriculture, broadcast, construction, education, government, manufacturing, nonprofit, publishing, restaurant, retail, sales (cars, insurance, realty, etc), utilities, etc.