

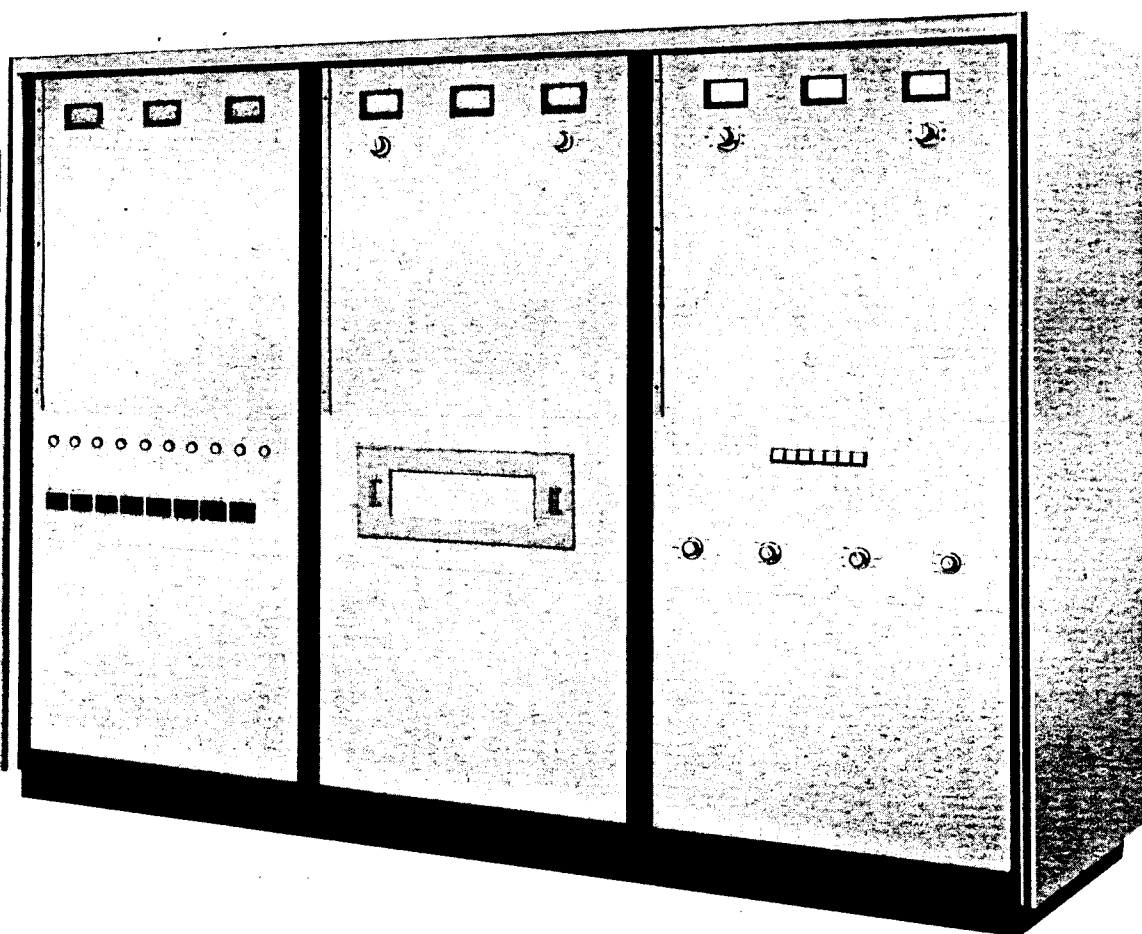
Collins Broadcast

THE POWER ROCK

Collins 828H-1 AM Transmitter

50-kW Medium Wave Broadcast Transmitter Features

- High-level (switching) Modulation
- Four-Tube Power Package
- Typical Total Efficiency Exceeds 60%
- Automatic Modulation Control
- No Modulation Transformer or Reactor
- Highly Stable 12-Phase Power Supply
- Final RF Amplifier Plate Circuit at DC Ground Potential
- No Blocking Capacitor
- No RF Feed Choke
- Peak Voltages Half that of Typical AM Transmitters
- Automatic Overload Recycling
- LED Operation and Fault Indicators
- Minimum Power Consumption — Only 85 kW at Carrier



PRELIMINARY CONCEPT

Collins 828H-1 PowerRock

Collins broadcast experts designed the 828H-1 for overall performance levels never before achieved by a 50-kW medium wave transmitter. With lower power consumption, this high-efficiency AM transmitter has a class D series switching modulator for high-performance modulation up to 125% positive.

4-Tube Power Package - Even Better Than We Say It Is

The 4CX35000C, switching tube and final power amplifier, operates well below manufacturers' dissipation ratings; the 3CX3000F7 is used as the rf driver; the F-1099 as the switching diode. The all solid-state power supply ensures long operating life. Collins designed reliability and long service life into the 4-tube power package and all the other quality components of the 828H-1.

60-kW Maximum Carrier

The rf power amplifier has a high-efficiency circuit with third harmonic resonators. This increases the rf power amplifier efficiency to nearly 90 percent and a maximum carrier power of 60 kW, allowing more headroom for driving directional antenna arrays. Audio and dc feedback (from the modulated dc voltage) provide nearly perfect power output control, improve distortion, response, and transient performance with processed audio waveforms. Stability and response problems usually associated with high Q, nonsymmetrical antenna loads are greatly reduced.

Exclusive Automatic Modulation Control

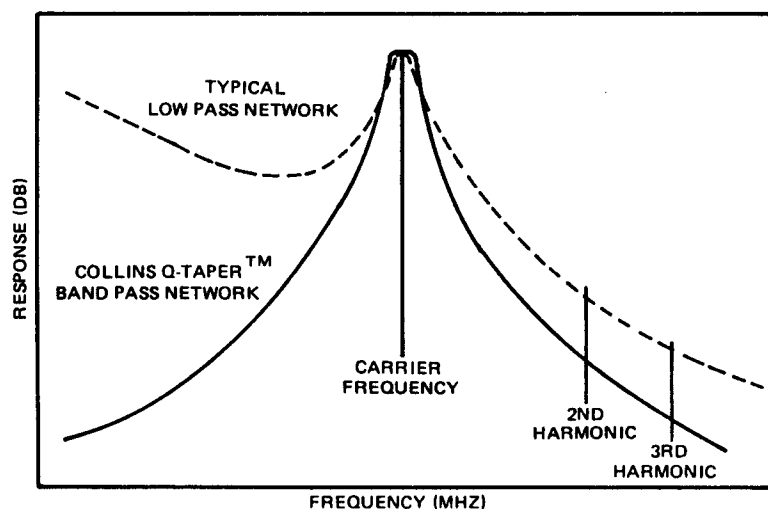
Collins automatic modulation control maintains desired modulation percentage whenever power output settings or line voltage fluctuations occur.

Protective Circuits

The major components of the 828H-1 are protected by circuit breakers and/or fuses. Tubes and semiconductors are protected by overload relays and other current-limiting devices. All interlocks are electromechanical. Front panel indicators display both forward and reflected power.

The Sensible Approach for Higher Efficiency

The rf amplifier and switching modulator each utilize a single air-cooled Eimac 4CX35000C tube. The low drive requirement of these tubes simplifies driver circuits and power requirements. Use of a single type for the modulator and PA reduces spare tube costs. The Q-Taper™ bandpass rf output network in the 828H-1 gives a flatter, wider passband response for better side-band performance and steeper skirts for better harmonic and spurious attenuation. No traps are required, and the network stress is reduced by operating with lower Q circuits. Bandpass characteristics and network design reduce intermodulation generated by nearby strong rf signals.



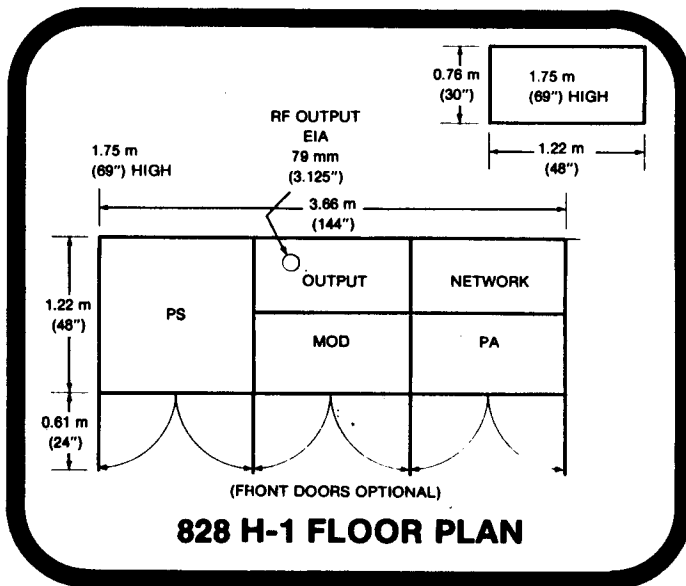
TYPICAL OUTPUT NETWORK RESPONSE

Whisper Quiet

The 828H-1 is kept quiet and cool with a self-contained blower that provides cooling for the power tubes. A low-speed fan constantly air-flushes the entire transmitter cabinet. All exhaust air can be ducted from the top of the transmitter to the outside of the transmitter building.

From Arctic to Tropics

The 828H-1 powers its way through all climate extremes and operates well within published specifications. High voltage transformers are oil filled. The Power Rock™ transmitter is designed for excellent operations at altitudes up to 2440 meters (8000 feet) above sea level.



Continuous 100% Modulation Rating

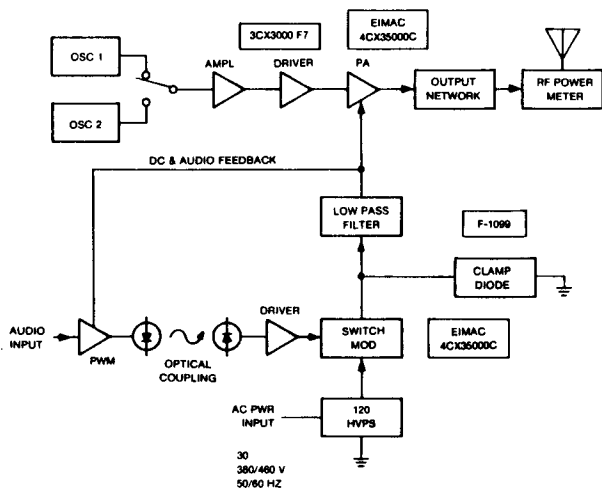
The 828H-1 is designed for continuous 100-percent sine-wave modulation, permitting higher than average modulation without increasing carrier power. When operating at a full 55-kW rf power output, the transmitter has a 125-percent positive-peak capability. The carrier power can easily be adjusted by a front-panel control with no change in output loading required.

Easy Access

Most of the components are easily accessible through the three front panels of the transmitter. Some components, such as the rf output coils and capacitors, are accessible from rear panels. The 828H-1 consists of three cabinets and an external high-voltage power transformer vault. The mainline circuit breaker assembly is built into the transformer cabinet. External connections to the transmitter are made through either the top or bottom of the unit, thereby creating installation flexibility.

Worldwide Application... Volt/Phase/Wire Flexibility

Because the 828H-1 uses Collins special 12-phase high-voltage power supply for increased operational stability, no additional transformers or modifications are required for operation from any voltage between 380 to 480 V ac, 3-phase, 3- or 4-wire. This additional flexibility, along with the small physical size, makes this PowerRock™ fit any worldwide application of this power range.



Unbeatable Specifications

Power Output	50,000 watts (rated), 60,000 watts (capable); power reduction to any power between 5000 and 60,000 watts
RF Frequency Range	535 to 1620 kHz; factory tuned and tested at specific frequency and power ordered
RF Output Impedance	50 ohms, 7.9 cm (3-1/8 in.) EIA (other as specified)
RF Frequency Stability	+5 Hz
RF Harmonics	-80 dB or better
Carrier Shift	Less than 2% at 100% modulation
Audio Frequency Response	Better than ± 1.5 dB, 20 to 10,000 Hz
Audio Frequency Distortion	Less than 3%, 20 to 10,000 Hz at 95% modulation
Noise (Unweighted)	-60 dB or better below 100% modulation
Audio Input	600/150 ohms at +10 dB mW ± 2 dB for 100% modulation
Power Input	380 to 480 volts, ac, $\pm 5\%$, 3-phase, 50/60 Hz, 3- or 4-wire (other voltages on request)
Power Consumption	85 kW at 0% modulation, 0.95 pF 92 kW at 30% modulation, 0.95 pF 115 kW at 100% modulation, 0.95 pF

Overall Efficiency	Better than 60% at average modulation
Tubes Used	4CX35000C (2), F-1099 (1), 3CX3000F7 (1)
Temperature Range	-20° to +50° C
Humidity	95%
Altitude	Up to 2440m (8000 ft) above sea level (higher on special order)
Size	
Transmitter Cabinet	1.75 m (69 in) high, 3.66 m (144 in) wide, 1.22 m (48 in) deep
External Power Supply	1.75 m (69 in) high
Transformer Vault	0.76 m (30 in) wide 1.22 m (48 in) deep
Floor Space	
Main Transmitter Assembly	4.56 m ² (48 ft ²)
Power Supply Transformer	0.89 m ² (9.6 ft ²)
Weight (Approximate)	
Main Transmitter Assembly	
Net Unpacked	2313 kg (5100 lb)
Domestic Packed	2812 kg (6200 lb)
Export Packed	3357 kg (7400 lb)
Power Supply	
Net Unpacked	567 kg (1250 lb)
Domestic Packed	680 kg (1500 lb)
Export Packed	771 kg (1700 lb)
Packed Space (cubage)	19.5 m ³ (690 ft ³)
Finish	Gray with black floor standoff and terra-cotta trim

Contact your local Collins Broadcast Salesman today
For his location or further information contact:

Collins Commercial Telecommunications Group

Rockwell International

Broadcast Products

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Dallas, Texas 75207

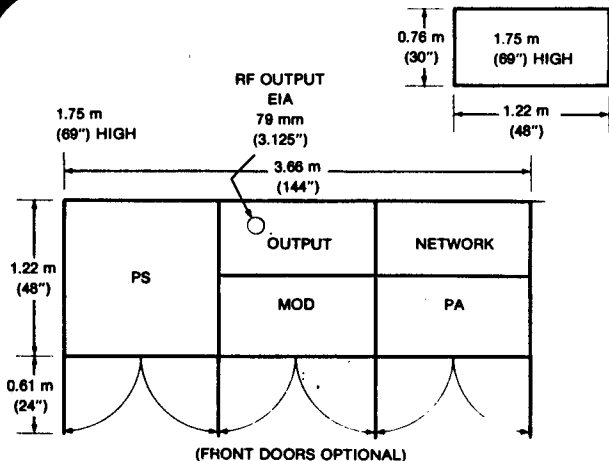
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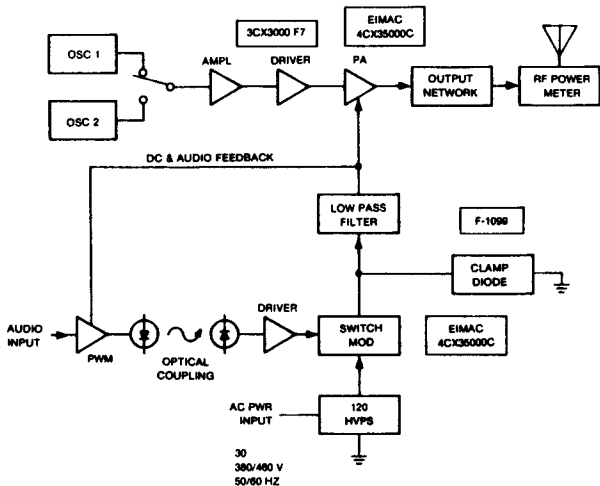
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828 H-1 FLOOR PLAN



Collins Radio Company Model 828H 50 kW. AM Transmitter

(4-21-03 Updated by Dave Hultsman – Birmingham, AL)

During the time I was with Collins Radio, Broadcast Divisions, Rockwell International, a plan was formulated to manufacture a 50 kW. PWM (Pulse Width Modulated tm) AM Transmitter. A preliminary brochure was produced and circulated to different broadcasters around the World. The principal design engineer was Don Colby, assisted by Forest Cummings and Jack Sellmeyer. The engineering supervisor was Lloyd Winter.

Collin actually received commitments for three of the transmitters from international customers. At that time, R&D funds from Rockwell had a number of levels to travel. The decision was, that the return on investment for the transmitter was not as fast as the return on investment of the Space Shuttle. The Broadcast Division was turned down on additional funding. The transmitter prototype was never completed.

Enough funding had been done that Collins had the cabinets and many components on hand for the construction of the first prototype of the transmitter. Many of the small components came from the 828E-1 (315R-1) 5 kW. “Power Rock” design.

Originally the design was a four tube transmitter using a 3CX3000F7 RF driver, two 4CX35000A tetrodes and a damper diode tube. Later the design was changed to The following tubes; 3CX3000F7 RF Driver, 3CX15000F7 switch modulator, and two 3CX15000F7 RF amplifiers. The damper diode was to be solid state. The design was to be similar to the successful Collins Power Rock-5. The overall tube cost was reduced significantly by use of the high-mu triodes. The tubes costs would be considerably lower than that of the 317C-2 and the MW-50. This transmitter would have been the smallest physical size 50 kW., AM transmitter in the marketplace.

Ah, but needless to say it was a dream of the Collins engineers and marketing group that never came to pass. When we moved from the Collins plant in Richardson to the Continental plant on Buckner Blvd. In Dallas, those three cabinets were within the inventory.

(Updated information supplied by Jack Sellmeyer 4-21-03)