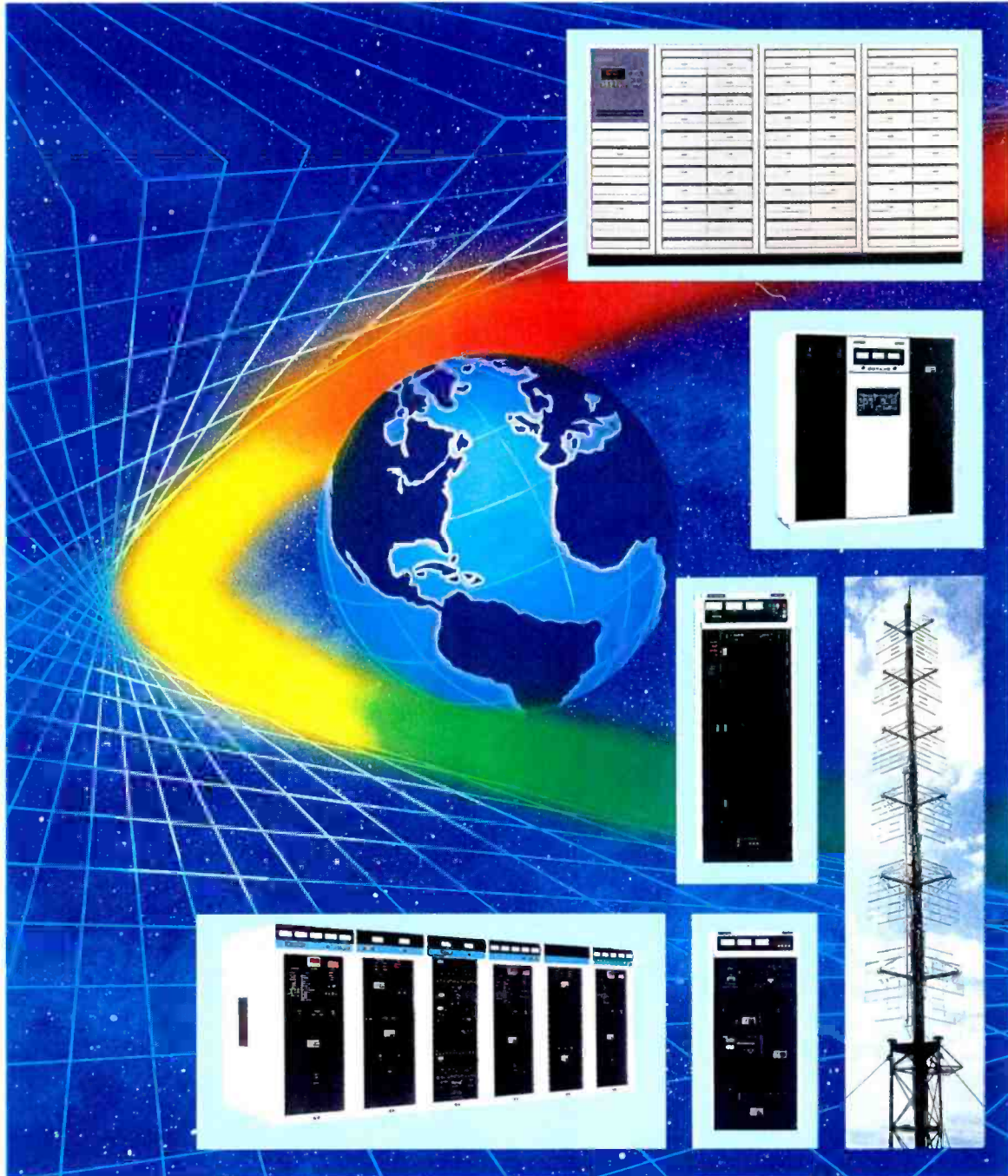




HARRIS

BROADCAST
DIVISION



Product Catalog



Harris Broadcast Division — The Broadcasters' Company

For over 66 years, one American company has represented the best in broadcast equipment technology.

That company is Harris Corporation's Broadcast Division.

Founded in 1922 as Gates Radio and Supply Company in Quincy, Illinois, Harris Broadcast Division has distinguished itself over the years for innovation in products and services, and an enduring commitment to the broadcast industry.

The result? A continuous stream of advanced products and services which have firmly established Harris as the leading manufacturer of radio and television equipment worldwide. To date, Harris has pioneered over 50 engineering breakthroughs — products that virtually have changed the way our world sees and hears itself — and holds more than 150 current patents. Backing these products is a commitment to unparalleled service and parts support and technical training.

Today, Harris Broadcast Division is the largest company dedicated solely to broadcast equipment manufacturing in the free world. In addition to manufacturing, engineering, training and test facilities which occupy approximately 250,000 square feet at the Broadcast Division's headquarters in Quincy, Illinois, Harris operates a 40-acre antenna test range optimally situated on the bluffs of the Mississippi River.

While broadcast equipment manufacturers have come and gone over the years, Harris Broadcast Division's commitment to products and service has remained a number one priority. From product design and manufacturing to installation and after-sale service and training, no one company is more dedicated to keeping you on the air than Harris — the Broadcasters' Company.

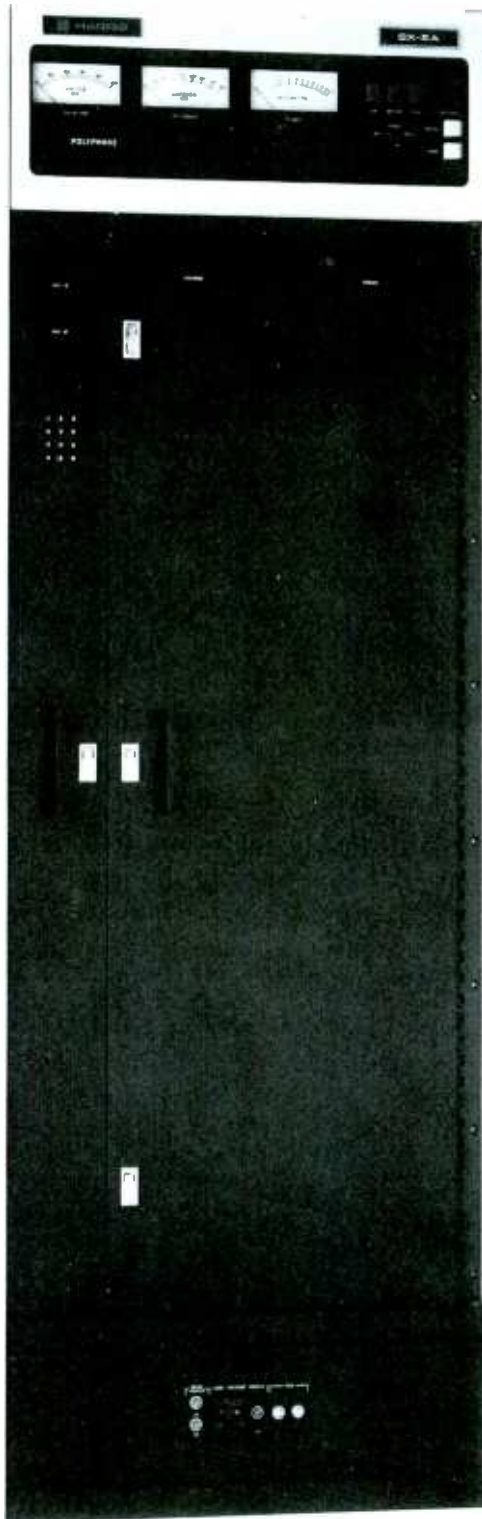
Want more
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about a specific
Harris product
or training
seminar?

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Harris AM transmitters have set the industry standards for performance and reliability virtually since the beginning of radio itself. Today, Harris offers a complete line of AM transmitters from 1 kW to 200 kW, as well as 50 kW and 100 kW shortwave transmitters.

AM/SHORTWAVE



SX-5A

Improved audio performance with advanced technology

- State-of-the-art modular design with socketed MOSFETs greatly simplifies routine maintenance.
- Extensive front-panel fingertip diagnostic system gives easy access to status information.
- Overall power amplifier efficiency typically exceeds 85%.
- The SX transmitter line typically yields overall efficiencies of up to 72% for reduced AC power costs.
- Designed for +125% peak capability and 100% continuous tone modulation. Capable of delivering greater average audio power for louder sound.
- Efficient, 100% solid-state design eliminates costly tube replacement. Engineered for low-cost ownership.
- SX "A" transmitters are provided stereo-capable from the factory.

Power Levels Available:

Single		Dual	
SX-1A	100 W-1.1 kW	SXD-2A	100 W-2.2 kW
SX-2.5A	250 W-2.75 kW	SXD-5A	250 W-5.5 kW
SX-5A	500 W-5.6 kW	SXD-10A	500 W-11 kW

SX "A" Series of Solid-State AM Transmitters

KEY OPTIONS

Single Phase — The 1 kilowatt and 2.5 kilowatt SX “A” transmitters are available for single phase installation. The 5 kilowatt model is available in either the standard three-phase model or for single phase installation. The single phase 5 kilowatt SX “A” transmitter is ideal for AM stations planning a power increase and wanting to avoid the high cost of running three-phase power to the transmitter.

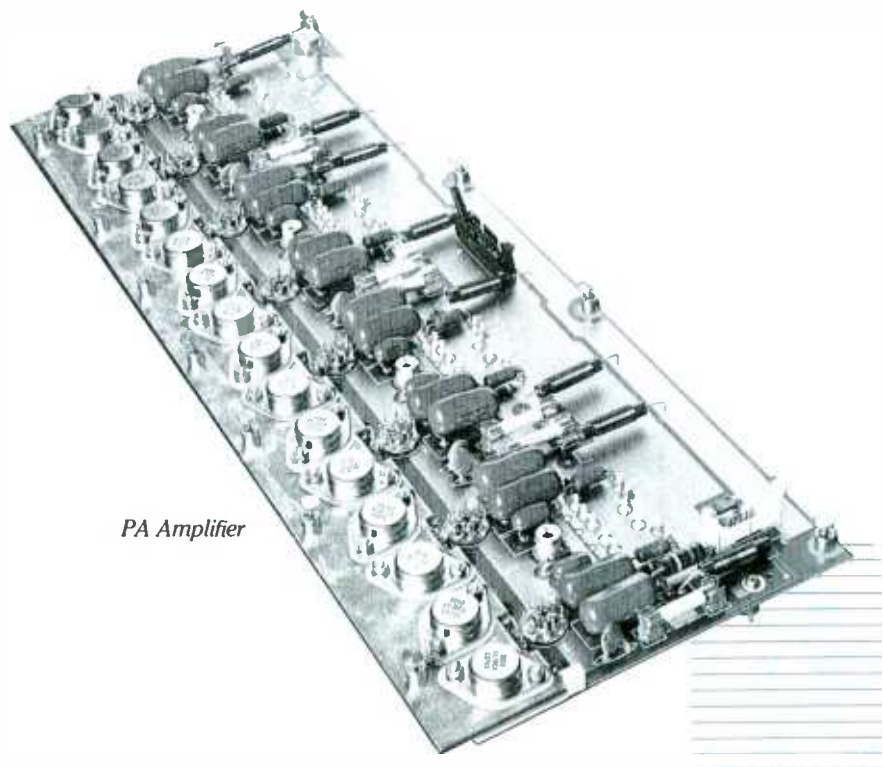


Microprocessor Keypad on Front Panel

SunWatch™ . . . An SX exclusive for daytime stations!

The Harris SunWatch option — available only on SX transmitters — allows daytime-only stations to conveniently extend their broadcast day while meeting the requirements of PSA/PSSA operation.

SunWatch provides easy, straightforward programming for pre-sunrise, daytime and multiple post-sunset operating schedules. It will accommodate up to ten programmed power levels per month, for an effective 120 power levels per year. Programming is easily reviewed and edited on the front-panel keypad.



PA Amplifier

86% Efficient

Unsurpassed performance and efficiency with Harris' exclusive digital modulator

- The world's first digital solid-state transmitters, featuring Harris' exclusive, patented design.
- Near perfect audio quality with virtually no overshoot, tilt or ringing, and the lowest distortion of any transmitter.
- The DX-10 typically operates at 86% overall power efficiency . . . unmatched in the industry . . . for the lowest possible utility costs.
- The DX-10 provides maximum loudness with 125% peak capability at full 11 kW power level for improved fringe coverage. 140% peak capability at 10 kW.
- 100% solid-state design eliminates tube replacement costs.
- Harris' FlexPatch™ permits operator to manually patch around a failure in the power amplifier section while continuing on-air operation.

- Extensive remote control and monitoring capabilities for ease of control and data retrieval.
- Low heat dissipation minimizes cooling costs.
- T matching network allows adjustment for optimum performance into real-world loads.
- Standard front-panel ColorStat™ monitors key operational stages; simplifies troubleshooting.
- Identical and interchangeable PA modules minimize spares requirements.

Power Levels Available:

DX-10	to 11 kW
DX-25	to 27 kW
DX-50	to 60 kW

Dual: DX transmitters may also be combined for double power and redundancy.

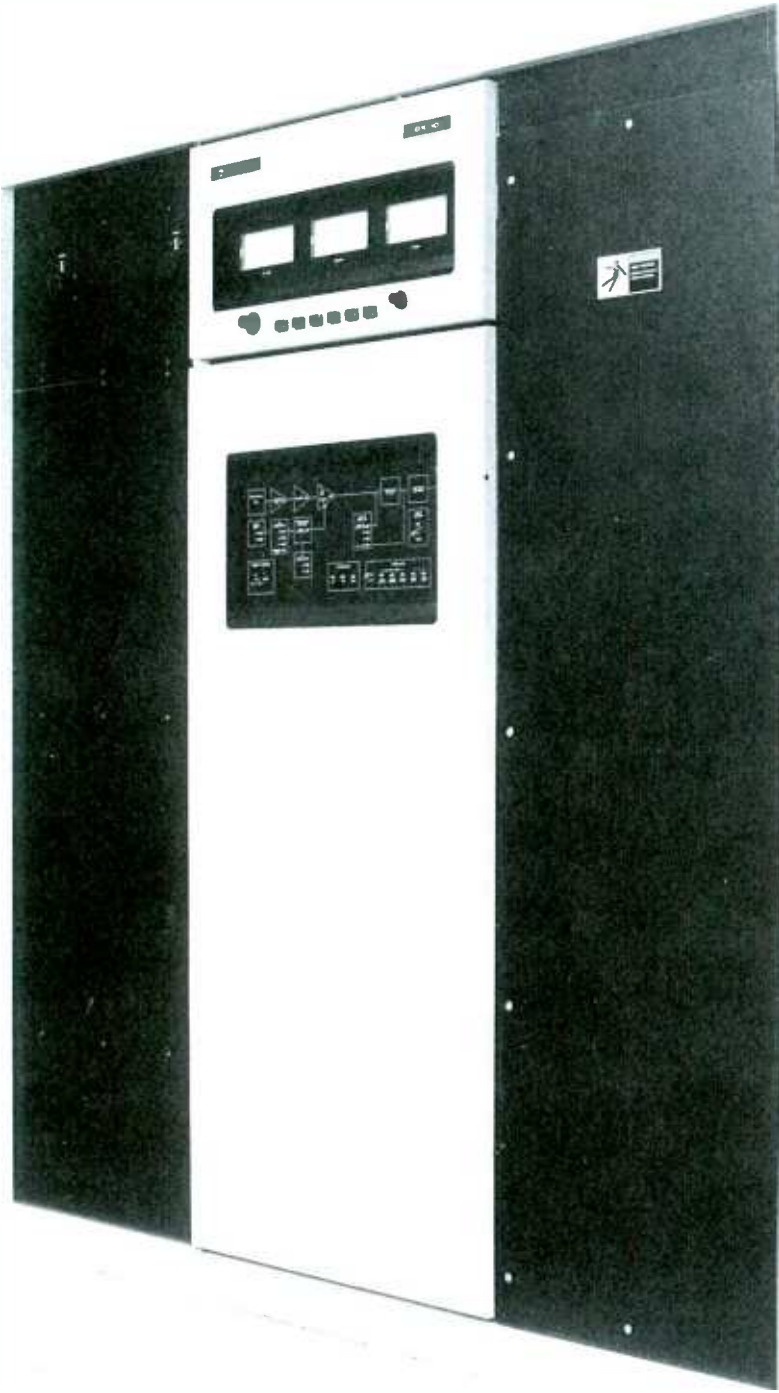
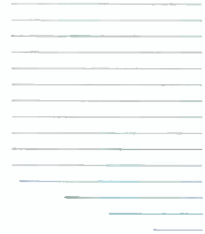


Modules are key to high efficiency, easy serviceability with the Harris DX-10.



DX Module

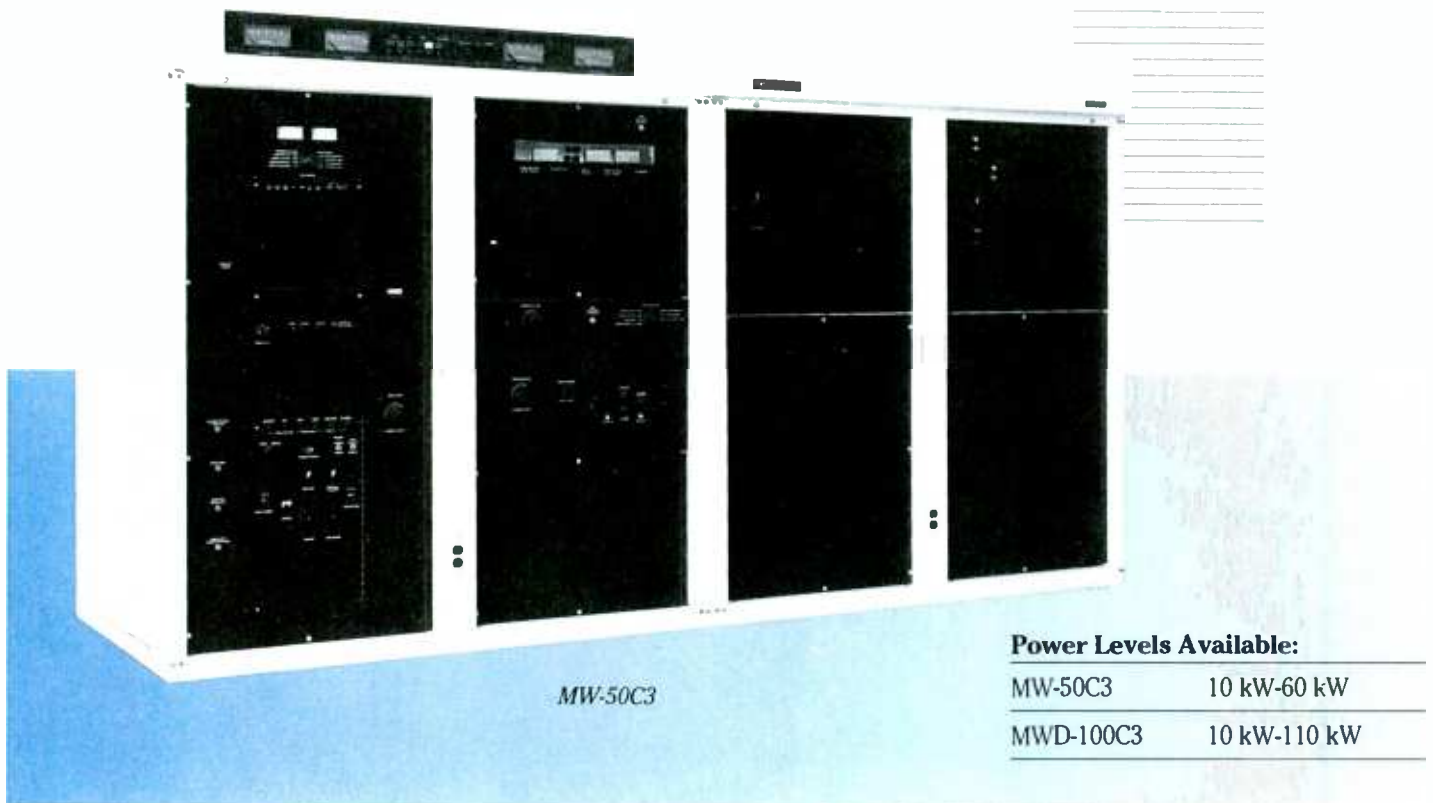
The DX Family of Digital Solid-State AM Transmitters



DX-10



The DX Family of Digital Solid-State AM Transmitters



Power Levels Available:

MW-50C3	10 kW-60 kW
MWD-100C3	10 kW-110 kW

Designed for high efficiency and top signal clarity

- Exceptional signal clarity and excellent mono or stereo performance, with 2.4% THD (total harmonic distortion) at 95%, and 2.4% IMD (intermodulation distortion) at 90% modulation.
- Offers high AC to RF overall efficiency typically exceeding 60%.
- Two rugged, long-life ceramic tetrodes operate in the power amplifier and modulator at close to 90% efficiency. Use of only three tubes and two tube types minimizes spares requirements.
- 100% continuous sine wave modulation capability allows transmission at higher average levels. More power in the sidebands means greater signal coverage.

- Complete overload protection with major components protected by circuit breakers. Tubes and transistors are protected by overload relays or current-limiting devices. A quick-acting circuit protects against damage from high-voltage arcs.
- Designed for easy monitoring and maintenance. Standard front panel includes meters and LED fault status to indicate overloads and monitor forward and reflected power. Easy front and rear access is provided.
- Automatic modulation tracking circuit maintains desired modulation level over a $\pm 20\%$ change in output power.

Solid-State Modulator Upgrade for MW-50/MW-50A/MW-50B/MW-50C AM Transmitters

- Replaces the tube-type modulator driver with a solid-state version.

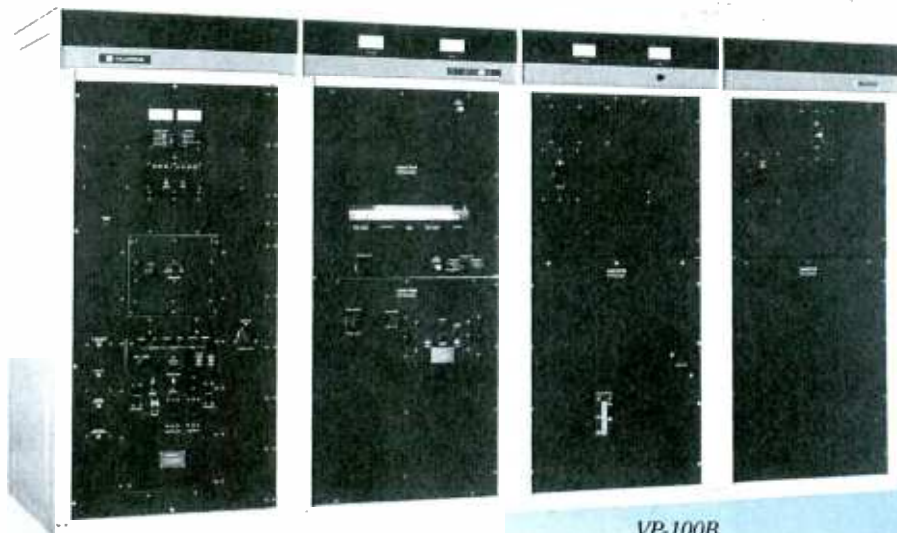
- Engineered for top performance in all types of climates, from hot and humid to dry and dusty.
- The MWD-100C3, for 100 kW operations, is also available.

KEY OPTIONS

Stereo Capability — The MW-50C3 can be ordered stereo-capable from the factory.

Extended Control Panel — Allows control and metering of transmitter from an adjacent room.

- Reduces IMD and THD.
- Reduces power consumption as well as maintenance costs.



Power Levels Available:

VP-100B	20 kW-100 kW
VP-200B	20 kW-200 kW

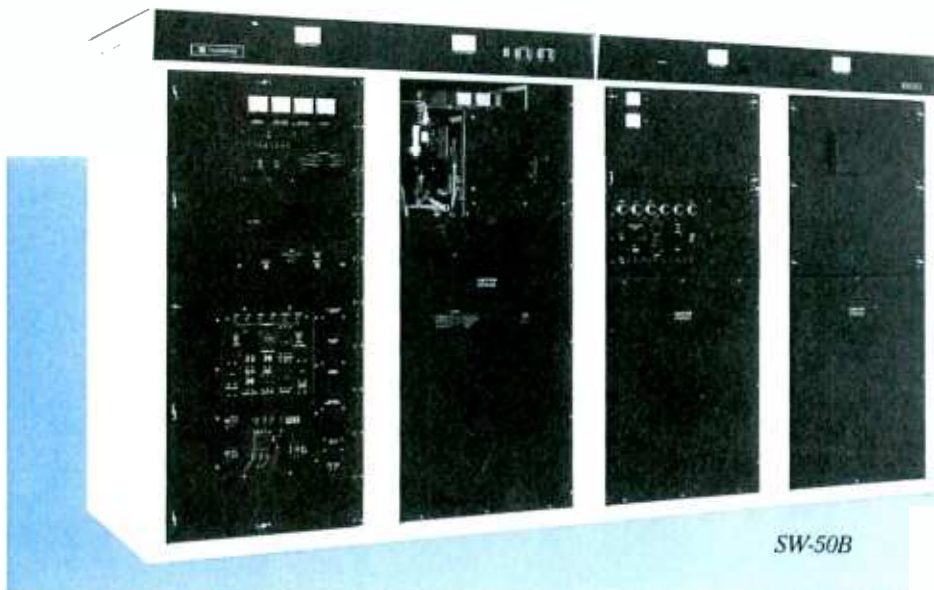
Reduced operating costs . . . exceptional signal clarity

- Typical overall efficiency exceeds 65% for reduced power costs.
- Harris' Pulse Duration Modulation system provides PA efficiency of almost 90%; eliminates costly, inefficient modulation transformer and offers superb audio performance.
- Uses only four tubes and three tube types for reduced spares requirements.
- Provides circuit breaker protection for all major components. Tubes and transistors are protected by overload relays or current-limiting devices. Built-in protection against damage from high-voltage arcs, voltage standing wave ratios greater than 1.2:1 and momentary RF overloads.
- Dual oscillator and modulator for redundancy in all transistor sections.

- Automatic modulation tracking circuit maintains desired modulation level over a $\pm 20\%$ change in output power.
- Offers regulated voltage supply for all low-voltage applications.
- Vapor-phase cooling eliminates need for large blowers; extends tube life by maintaining tube anode temperatures far below those attained by other cooling methods.
- Rugged design ensures top performance in a wide variety of climates.
- The VP-200B, for 200 kW operations, is also available.

KEY OPTIONS

- Remote Control** — Allows control of transmitter from virtually anywhere.
- Extended Control** — Allows control and metering of the transmitter from an adjacent room.
- 50 ohm Output and Tri-Level Power** — 230 ohm output and bi-level power standard.
- High Frequency Stability** — High-stability oscillators can be supplied for critical applications.
- Harris Water Purification Unit** — This five-filter system, available for use with Harris vapor-cooled VP and SW Transmitters, makes any water supply suitably pure for transmitter cooling. Features a safety interlock system for extended pump life and an LED meter for monitoring purity levels. Can be easily moved for convenient use in multiple-transmitter installations.



Power Levels Available:

SW-50B	50 kW
SW-100B	100 kW

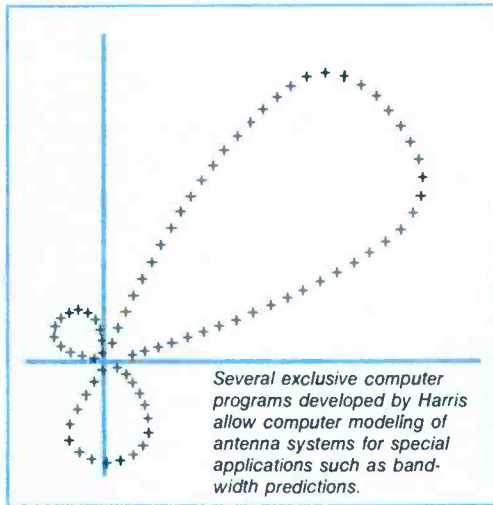
Offering superior performance and efficiency to shortwave broadcasters

- Designed for low operating costs with PA efficiency approaching 90% and typical overall efficiency over 55%.
- Harris' Pulse Duration Modulator eliminates need for modulation transformer and reactor — items which can limit modulation performance and prove costly if necessary to replace.

- Standard solid-state power line control automatically ensures uniform transmitter operation during moderate swings in incoming AC line voltage.
- Designed for a wide range of climates, from hot and humid to dry and dusty.
- Use of only four tubes and three tube types minimizes spares inventory requirements.
- Ten-channel pre-set tuning facilitates operation. Up to ten different frequencies — from 3.2 to 22 MHz — can be remembered, allowing pushbutton retuning to any pre-set frequency.
- The SW-50B, for 50 kW operations, is also available.

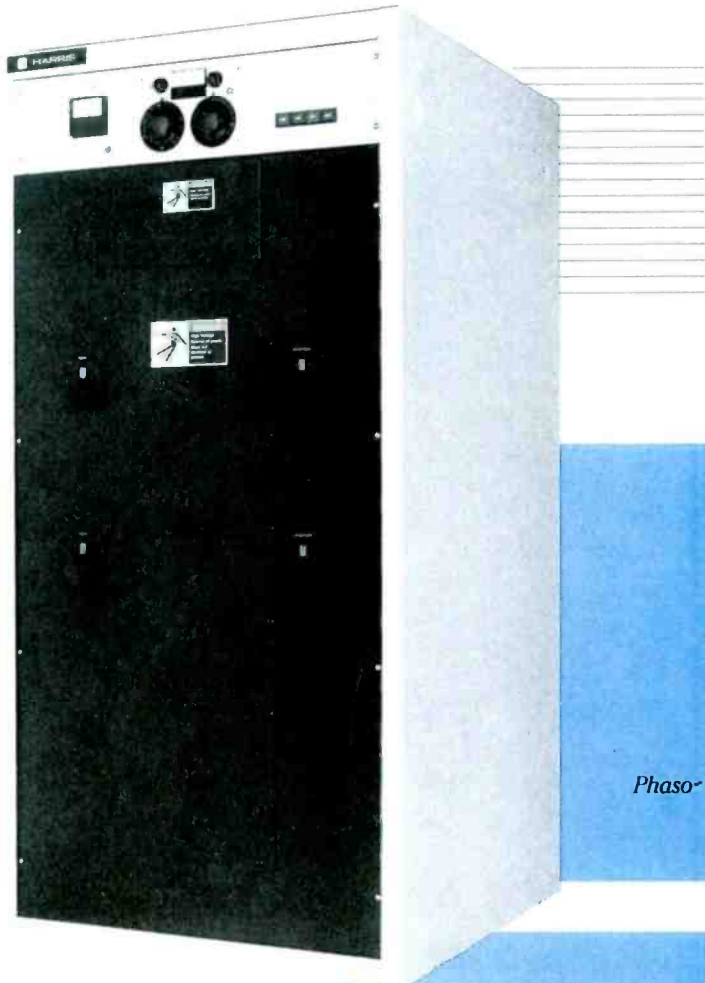
KEY OPTION

External Frequency Synthesizer Input Port — Allows operation of transmitter with an external frequency synthesizer.



Power Levels Available:

250 W-200 kW



Phasor

Medium Wave Phasing Systems

- Computer-aided design and analysis of complete phasing system to ensure best bandwidth for chosen pattern.
- Factory pre-tuning to predicted values with a network analyzer and vector impedance meter for accuracy in impedance match and desired phase shift. Greatly reduces initial setup time.
- Medium- and low-power phasor line features a removable front panel and rear lift-off door in a new 36" cabinet. Front and rear accessibility ensures easy setup and maintenance.
- Silver-plated coils and copper ground straps — the features most requested by professional consultants — are standard.
- A Delta common point meter, standard on Harris phasors, provides accurate readings with modulation and access for remote metering sample.

KEY OPTIONS

Common Point Impedance Bridge

— Harris features the Delta common point bridge and RF ammeter on a very attractive panel.

Main/Auxiliary/Dummy Load Switching

— Provides convenient control of two transmitters while terminating the standby transmitter into the dummy load.

Delta Base Current Meters

— Provide accurate readings unaffected by modulation, plus DC remote output for monitoring.

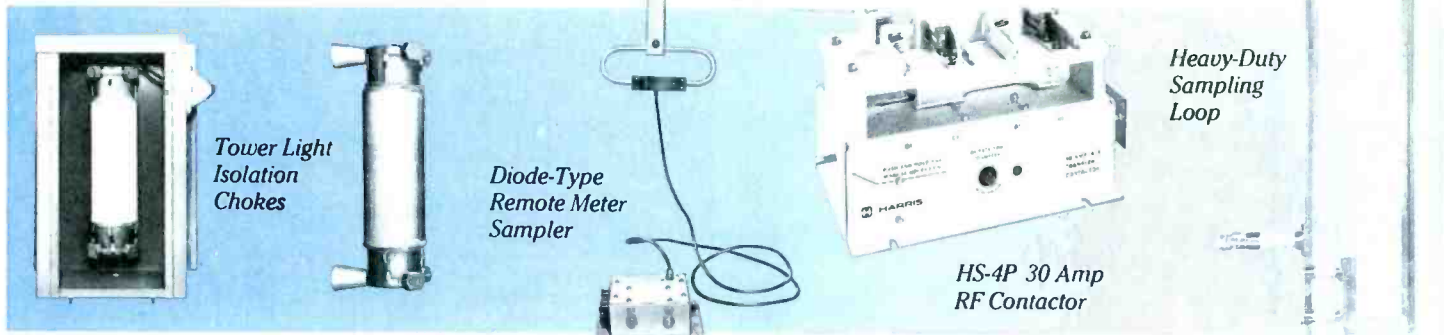


1 kW Antenna Coupling Unit

Antenna Coupling Units

Standard 1, 5 and 10 kilowatt ACUs for quarter-wave antennas, and special 250 watt through 200 kilowatt ACUs for various antenna heights, are available.

Medium Wave Antenna Accessories



Tower Light Isolation Chokes

Diode-Type Remote Meter Sampler

HS-4P 30 Amp RF Contactor

Heavy-Duty Sampling Loop

Tower Light Isolation Chokes — Provide power to insulated towers for tower lighting requirements. Available in two- or three-wire models.

Isolation Coils — 1/2" or 3/8" phase-stabilized foam transmission line coils are available with optional resonating capacitor. Can be mounted on flat aluminum panel or in a weatherproof enclosure.

Diode-Type Remote Meter Sampler — For remote indication of RF current. Used primarily in attaining RF remote metering samples when thermocouple base meters are used.

HS-4P 30 Amp RF Contactor — Motorized medium wave RF contactor. DPDT. Requires 208/230 VAC, 50-60 Hz at one ampere. Microswitches provided for external indicators or interlocks.

Heavy-Duty Sampling Loop — Rugged, fixed, non-shielded RF sampling loop is heavily galvanized after welding. Fitted with large seatite insulators and heavy-duty tower leg clamps for easy, positive mounting. Has "N" female connector input.

Harris also offers phase monitors, operating impedance bridges with the optional RF frequency synthesizer detector, and field intensity measuring equipment.



AM-90

AM-90 Medium Wave Modulation Monitor

- Designed for continuous monitoring of the amplitude modulation envelope in the 450 KHz to 30 MHz frequency range.

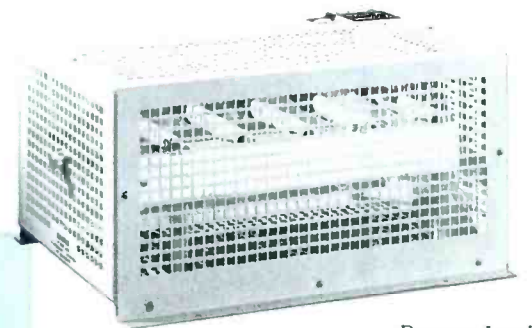
- Easy-to-read neon bar display accurately measures carrier and modulation levels.

- Two fixed flashers adjusted to +125% and -100% for constant monitoring of modulation levels.

- Carrier and modulation alarms illuminate when carrier amplitude drops below 50% of the pre-set level or when modulation remains under 10% for ten seconds.

KEY OPTION

AM Remote Meter Panel — Provides accurate monitoring and measurement readings at operator's position in transmitter facility.



Dummy Load

1100 Watt Dummy Load

- A low-cost maintenance accessory that provides a proper termination for the transmitter for testing.

- Ten non-inductive resistors provide a nominal 50 ohm impedance from 0.5 to 1.7 MHz and have a power rating of 1100 watts at carrier with full 100% tone modulation.

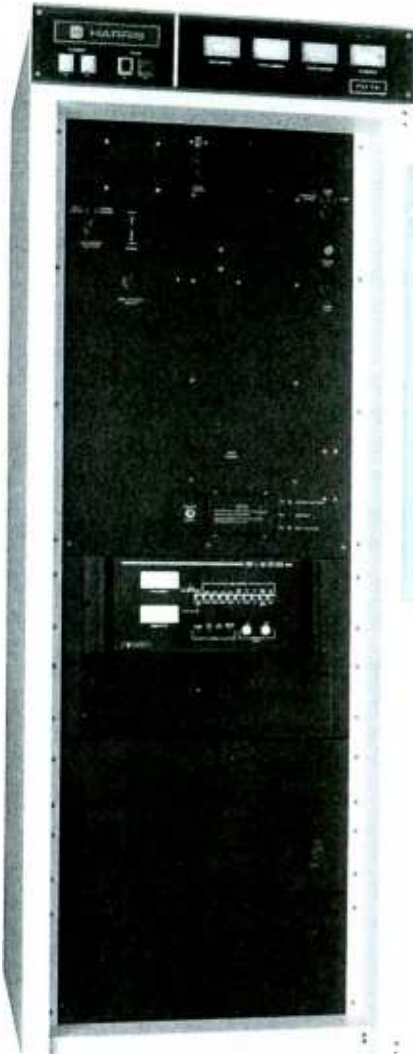
- No cooling fan required. Unit is convection cooled.

- Female "N" connector input provides easy and convenient hookup during transmitter maintenance.

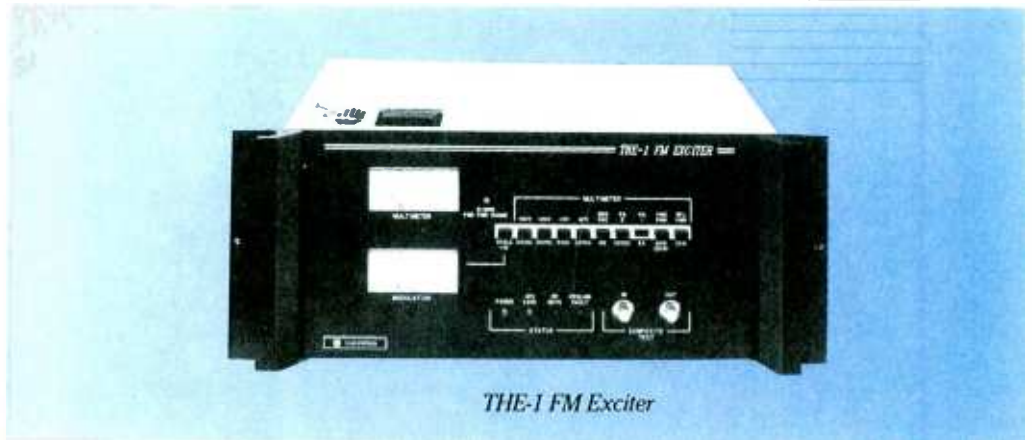
Harris has revolutionized FM broadcasting with the addition of new, technologically-advanced products to its line of 55 watt to 70 kW FM broadcast transmitters.

Power Levels Available:

THE-1	3 W-55 W
FM-100K	40 W-100 W
FM-300K	135 W-300 W
FM-1K	500 W-1.1 kW



FM-1K



THE-1 FM Exciter

Superior on-air reliability with low power consumption

- Harris' THE-1 FM Exciter*, rated at 55 watts or 15 watts RF output, is standard on all Harris FM transmitters and ideal as a low-power transmitter.
- Advanced solid-state design (FM-100K, FM-300K) for top reliability and no tube replacement.
- The FM-1K's one tube power amplifier is operated well within its ratings for long tube life.
- Single phase power supply eliminates the need for costly three-phase AC service.
- With full remote control interfacing standard on all models, and monaural input standard on THE-1, Harris saves you money on costly options.

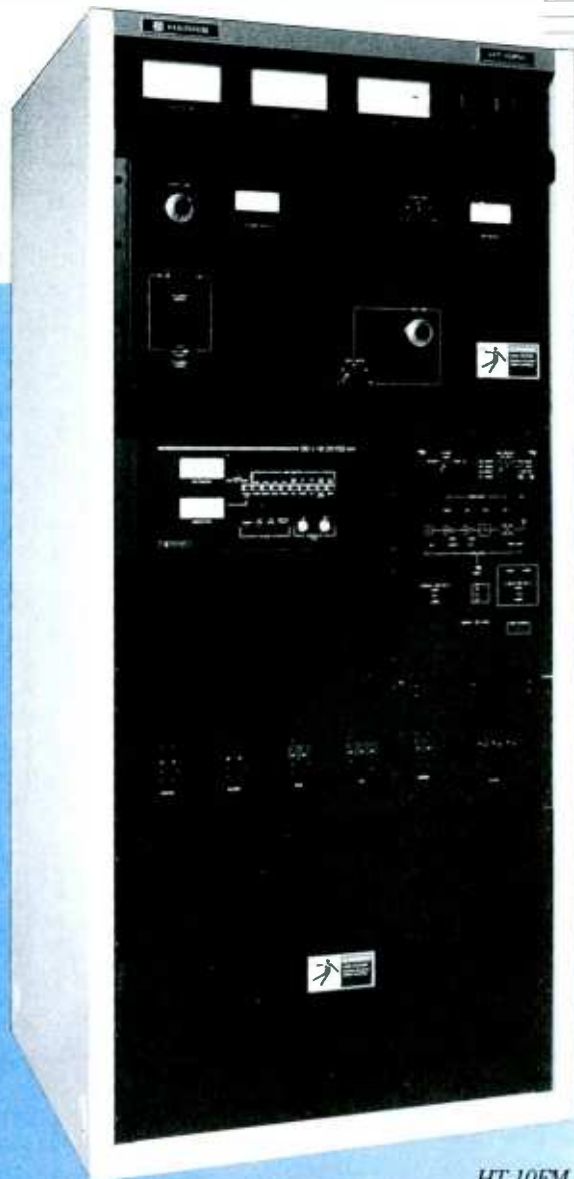
- Easy accessibility means quicker servicing and lower costs.
- Easy-to-read control and status indicators aid operation and servicing, and minimize downtime.

**For further information on THE-1 FM Exciter, see page 15.*

KEY OPTION

Stereo/SCA Generators — Space is available in the FM-300K and FM-1K transmitters for addition of stereo and SCA generators.

FM



HT 10FM

Power Levels Available:

HT 3.5FM	800 W-4 kW
HT 5FM	1.5 kW-5 kW
HT 10FM	5 kW-10 kW

**The power you want . . .
the durability you need**

- Single tube design with long-lasting, high-efficiency tetrode operating in wideband, quarter-wave cavity.
- Harris' high-power 55 watt THE-1 FM Exciter delivers outstanding reliability and super-clean signals. Monaural, composite and SCA subcarrier inputs standard.
- RF patch-around capability keeps you on the air at reduced power during emergencies.
- Automatic AC restart feature immediately returns transmitter to service when power has been restored after an outage.
- Automatic VSWR foldback helps keep transmitter on the air during antenna icing conditions.
- Front-panel block diagram display helps isolate problems and minimize downtime. LED indicators signal circuit status in each major functional stage and have fault memory in case of power failure.
- Automatic power control minimizes operator adjustment and maintains output power to within $\pm 5\%$.
- Full remote control interface included.
- Modular design ensures easy access for maintenance and repair.

IC 12

KEY OPTIONS

Stereo Generator — Space is available in transmitter for addition of stereo generator.

AC Power — Single phase power is standard on the HT 3.5FM and HT 5FM, and optional on the HT 10FM. Three-phase power is standard on the HT 10FM.

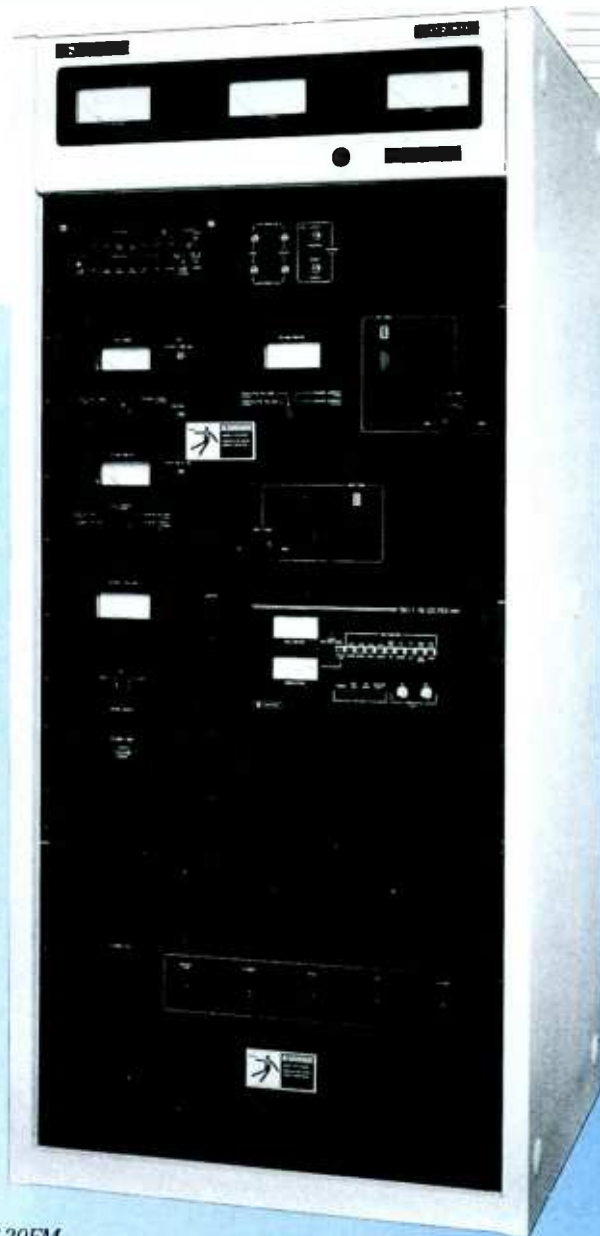
HT 3.5FM/HT 5FM/HT 10FM Transmitters

Power Levels Available:

Single		Dual	
HT 20FM	8 kW-20 kW	HTD 40FM	16 kW-40 kW
HT 25FM	8 kW-25 kW	HTD 50FM	16 kW-50 kW

High efficiency . . . wide RF bandwidth . . . single tube design

- Quarter-wave PA cavity for best stereo and SCA performance, and lowest synchronous AM.
- PA efficiency exceeds 77% for substantially greater savings over other designs.
- Wide RF bandwidth (greater than 2.8 MHz) provides signal transparency.
- Harris' high-performance THE-1 FM Exciter provides exceptional audio performance. Rated at 55 watts or 15 watts RF output.
- Automatic VSWR foldback keeps station on the air during antenna icing conditions.
- Low-noise air system for extremely quiet operation.
- Rugged, long-life tetrode means lower maintenance cost.
- Automatic AC restart provides built-in protection against total AC failure and loss of phase. Will restart automatically following a total power failure.
- FlexPatch™ capabilities allow bypassing defective stage for maximum on-air reliability.
- Status and overload LEDs provide fast evaluation of transmitter conditions.
- Built-in remote control interface for easy operation and monitoring.
- Full featured, yet easy to maintain.
- Small cabinet design allows you to make more efficient use of station floor space.



HT 20FM

HTD 40FM/HTD 50FM Dual Combined Transmitters

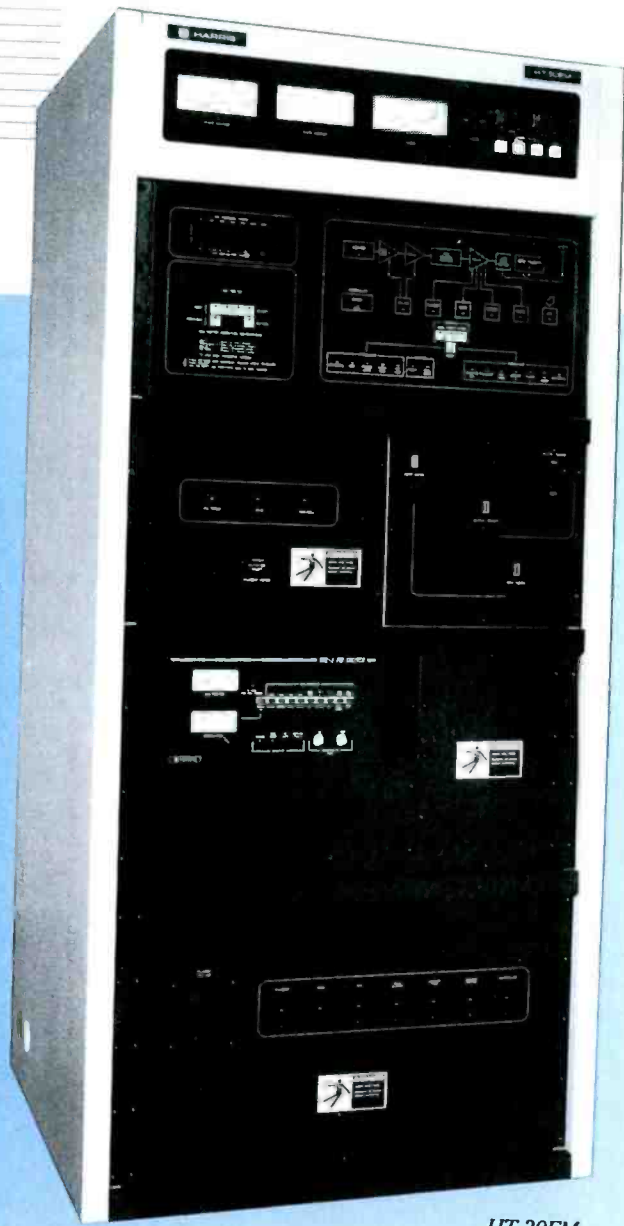
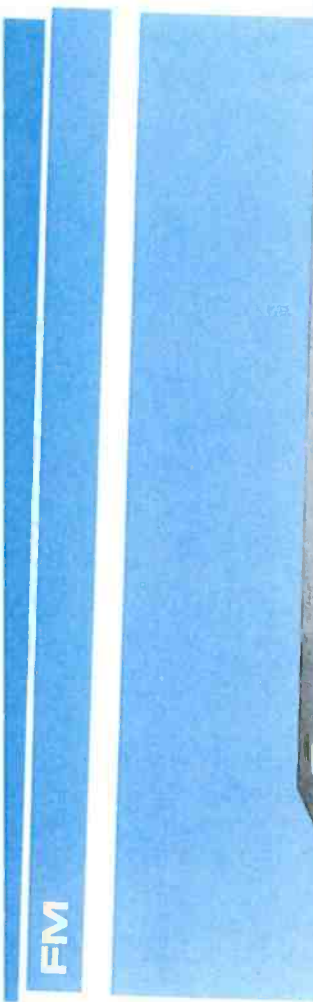
- Dual combined transmitter configuration allows transmitter maintenance at any time with minimal loss of coverage. Totally redundant system minimizes off-air time.

KEY OPTIONS

For Dual Combined Transmitters:

- Automatic Output Switching** — Provides the capability of switching either transmitter directly to the antenna, supplying one-half normal operating power in the event of transmitter malfunction.
- Automatic Exciter Switching** — For automatic backup exciter protection.

HT 20FM/HT 25FM Transmitters



HT 30FM

Power Levels Available:

Single		Dual	
HT 30FM	10 kW-30 kW	HTD 60 FM	20 kW-60 kW
HT 35FM	10 kW-35 kW	HTD 70 FM	20 kW-70 kW

The right choice in high-power, high-performance FM transmitters

- Quarter-wave PA cavity for best stereo and SCA performance and lowest synchronous AM.
- PA stage is 80% efficient over a wide power range for low operating costs and longer tube life.
- Built-in FlexPatch™ capability permits the preamplifier, IPA or even the final PA to be bypassed for continued operation at reduced power during emergency conditions.
- Low-noise blower provides ample cooling to 10,000-foot altitudes.
- ColorStat™ front-panel signal flow diagram immediately identifies problem stage, aiding repair and minimizing downtime.
- Main controller works in parallel with a discrete logic backup controller, assuring basic operation should the main controller require service.
- Both transmitters feature Harris' THE-1 55 or 15 watt solid-state FM Exciter — providing a high-power, high-performance signal source.

HTD 60FM/HTD 70FM Dual Combined Transmitters

- Dual combined transmitter configuration allows transmitter maintenance at any time with minimal loss of coverage. Totally redundant system minimizes off-air time.

KEY OPTIONS

For Dual Combined Transmitters:

- Automatic Output Switching** — Provides the capability of switching either transmitter directly to the antenna, supplying one-half normal operating power in the event of transmitter malfunction.
- Automatic Exciter Switching** — For automatic backup exciter protection.

HT 30FM/HT 35FM Transmitters

THE-1 55 Watt Solid-State FM Exciter

- Wide RF bandwidth provides signal transparency to exciter's performance.
- Automatic VSWR foldback keeps station on the air during antenna icing conditions.
- High gain, single tube design minimizes tube maintenance costs.
- All signal input and output connections are made on a conveniently located interface panel.
- AC restart feature provides built-in protection against total AC failure and loss of phase. Will restart automatically following a total failure.
- Standard remote control and extended control designed to interface with simple or full-featured remote control systems.
- Front-panel StatusPlus™ automatically logs the date and time when any of seven major overloads occur. Information is stored continuously and can be recalled easily. Helpful in isolating problems.

For top performance in any FM transmitter . . . and ideal as a low-power FM transmitter

- Switch-selectable dual power ranges (3 to 15 watts or 3 to 55 watts) and low-profile, slide-out drawer construction ensure easy, direct use in any FM transmitter — old or new.
- Approved as a low-power (5.5 to 55 watts) FM transmitter.
- RFI and transient protection on all inputs and remote outputs for maximum reliability in less-than-ideal environments.
- Ultra-linear, voltage controlled oscillator (VCO) has superb linearity for virtually transparent passage of stereo and multiple subcarriers.

- Modular design and conveniently located controls make adjustment and servicing easy. Broadband modular output amplifier requires no tuning. Comprehensive metering, status and control functions are provided.
- Other standard features include monaural input with selectable pre-emphasis, front-panel composite test input/output, built-in remote control interface, two composite and two SCA inputs for use with optional external generators.

Power Levels Available:

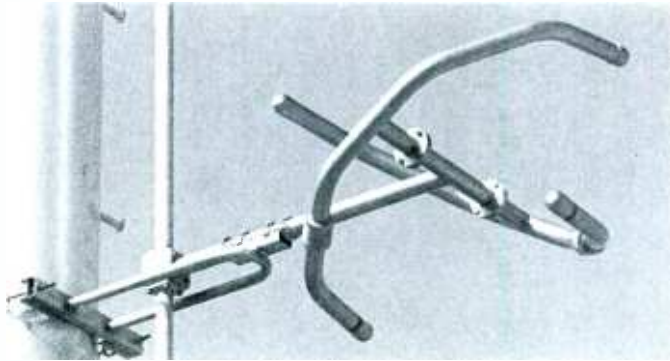
3 W-15 W

3 W-55 W

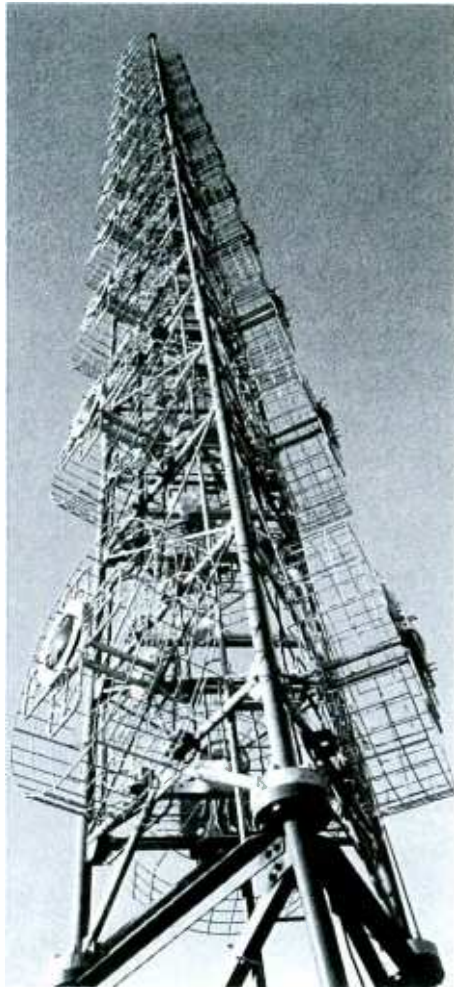


THE-1 FM Exciter

FM



FML Low Power



A complete line of FM antennas for every application

- Multi-station CBR allows up to ten stations to share expense.
- Superb axial ratio and pattern circularity for optimum coverage.
- Excellent bandwidth for best stereo/SCA performance.
- Power ratings to meet every application.
- Rugged brass and stainless steel construction for long, trouble-free life.
- Fully assembled and tested to ensure top performance.
- Brackets included for face or leg mount on typical tower.

KEY OPTIONS

- Pattern Testing/Optimization** — Custom measurements for your frequency and tower size.
- Half-Wave Element Spacing** — Minimizes radiation levels near tower and reduces local interference.
- Electrical De-icers or Radomes** — Reduce effects of antenna icing.

All standard Harris FM antennas* have the same published gain for equivalent number of bays, as shown below.

No. of Bays	Power Gain
1	0.4611
2	0.9971
3	1.5588
4	2.1322
5	2.7154
6	3.3028
7	3.8935
8	4.4872
9	5.0826
10	5.6800
11	6.2783
12	6.8781
13	7.4785
14	8.0800

**Omnidirectional, circularly polarized mode without beam tilt and null fill, and with one wavelength vertical element spacing.*

Cavity Backed Radiator (CBR)

FMH High Power

FMC



Automatic Changeover Panel

■ Automatic switching for minimum off-air time in the event of a power failure.

■ Full ON sequencing means standby transmitter may be a hot or cold unit.

■ All transfer functions are provided by the panel . . . no direct control of the transfer switch is required.

■ All ON-OFF and MODE commands remote controllable. Full control of both transmitters and the switcher panel from the remote control point.

■ Dry contacts provided for control of transmitters and the transfer switch. Compatible with virtually all transmitters.

Constant Voltage Filament Regulator Option

■ Designed for any Harris FM transmitter with PA tube* that operates in an environment where the AC power source is subject to fluctuation.

■ Provides tight voltage regulation for the PA tube's filament, resulting in controlled filament heat, controlled peak filament emission and extended tube life.

**Except the FM-1K which already has a built-in constant voltage filament regulator.*

FM Accessories

Calculation of Transmitter Output Power

Transmitter output power may be calculated by the following formula:

$$\text{Transmitter Output} = \frac{\text{Licensed ERP (max.)}}{\text{Antenna Gain} \times \text{Coax Efficiency Factor}}$$

Antenna gain for standard Harris FM antennas may be found on page 16 of this catalog.

Coax Efficiency Factor at approximately 98 MHz for various lengths of transmission line may be taken from the table below. Consult manufacturer's data for loss for other line lengths and frequencies.

EXAMPLE:

What transmitter power is required for 50 kW ERP at 98.1 MHz with a six-bay antenna and 550' of 3" Andrew Heliax?

$$\frac{50,000}{3.3028 \times .839} = 18,044 \text{ watts (ANSWER)}$$

FM Transmission Line Efficiency

The chart below shows approximate efficiency factors for various lengths and types of commonly used coaxial transmission line (98 MHz).

Efficiency Factor for:	Semi-Flexible Coax (Andrew)							Rigid Coax (Dielectric)			
	7/8"	1 1/4"	1 5/8"	2 1/4"	3"	4"	5"	1 5/8"	3 1/8"	4 1/16"	6"
350'	.745	.803	.848	.874	.894	.914	.939	.859	.927	.948	.961
550'	—	.709	.771	.809	.839	.868	.906	.787	.888	.920	.940
1050'	—	—	—	.668	.715	.763	.828	—	.797	.853	.888
2050'	—	—	—	—	—	.589	.692	—	.642	.732	.794
Loss/100' (dB)	.366	.272	.205	.167	.139	.112	.078	.189	.094	.066	.049
Power Rating**	5.2	7.5	11.7	16.2	29.9	45.4	59	8.7	33	62.6	131

**Approximate rating in kilowatts at 1.5:1 VSWR, 104°C ambient, 1 atmosphere dry air pressure.

Harris audio equipment — a perfect blend of engineering advances, no-compromise performance and user-friendly designs — all at a competitive price.



Digital Audio
Tape Recorder
(DAT)

Digital Audio Tape Recorder/ Playback Unit (DAT)

■ Superior sound quality from digitizing and accurately processing the audio signal . . . with an extremely wide dynamic range, practically unmeasurable distortion and ruler-flat frequency response.

■ High-speed cue/review, accessible from the front panel, allows fast, easy access to any cut on a cassette.

■ Can be rack mounted to save space. Cassette tapes are about half the size of conventional cassettes.

■ Digital playback/record capabilities at 48 kHz. Digital playback at 44.1 kHz.

■ The forward/backskip function permits rapid re-cue to the previous cut or next cut.

KEY OPTIONS

Hard Wired Remote Control —

Allows you to easily cue any cut on a cassette. Start-ID and program numbers can be automatically placed in the sub-code field of the tape to locate a desired cut.

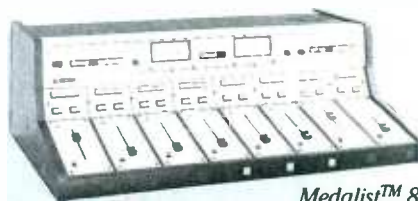
Rack Mount — 7" x 19".

DT60/DT120 Digital Cassettes —

Choice of 60- or 120-minute durable, long-playing cassettes.

DAT Specifications

- 16-bit digital audio.
- Three sampling frequencies.
- Unmeasurable wow and flutter.
- 92 dB S/N.
- 2 Hz-22 kHz \pm .5 dB.



Medalist™ 8

Medalist™ Dual Stereo Audio Consoles (8, 10 or 12 Channel Models)

■ A user-friendly design to minimize user error, with color-coded switching, wide attenuator spacing, and choice of plug-in and interchangeable rotary or linear attenuators.

■ Superb audio performance ensured with excellent RFI and EMI immunity and signal-to-noise performance, and extremely low THD and IMD.

■ Console includes three inputs into each channel. Optional fader modules can expand inputs to six per channel.

KEY OPTIONS

Mono/Sum Output Channel —

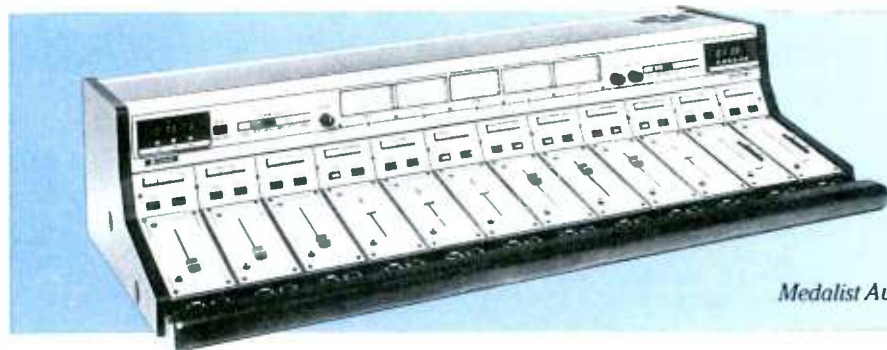
Standard on Medalist Au and Medalist 12. Provides a mono sum channel for Medalist 8 and 10.

Microphone Pre-amps — Two are included with each Medalist console. Additional pre-amps can be added, up to the maximum of 8, 10 or 12 per console style.

Nose Cone — For mounting up to three source start switches per channel on the 8 channel, 10 channel and 12 channel Medalist.

Momentary or Alternate Action Switches — Provide dry contacts to control your sources.

Clock and Timer — Mounting provided for optional clock and timer on the Medalist Au and Medalist 12.



Medalist Au™

Medalist Au™ 12 Channel Dual Stereo Audio Console

■ Five VU meters provide full visibility of all critical output levels.

■ Thirty-six inputs with logic-controlled switching provide START and STOP control of up to three sources per input channel.

■ Up to 72 sources into 12 input channels expand total input capacity to six sources per input channel with optional four input linear fader modules.

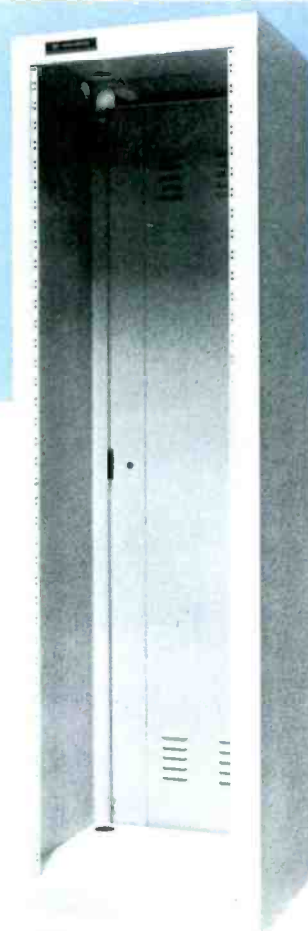
■ End-of-message controlled channel-off switching eliminates unwanted noise and extraneous signals from the program output channel.

■ Choice of various fader modules in both linear and rotary models to match your station requirements.



Phase Fixer

Rack Cabinet



Phase Fixer Digital Audio Time Base Corrector

- Improves stereo on-air sound by eliminating audible phasing errors on encoded stereo carts and tapes.
- Reduces flutter to insignificant levels on encoded stereo carts and tapes.
- One Phase Fixer at the output of the studio console will handle all the encoded carts played back. Additional encoders are available for each cart record studio.
- Uses 16-bit digital audio delay to achieve low-noise, high-fidelity audio time base error correction.

Phase Fixer Specifications

Audio Input: Active balanced
600 ohms or bridging.

Input Level: +26 dBv max.

Output Level: +24 dBm into
600 ohms max.

Distortion: THD less than .2%,
30 Hz to 15 kHz.

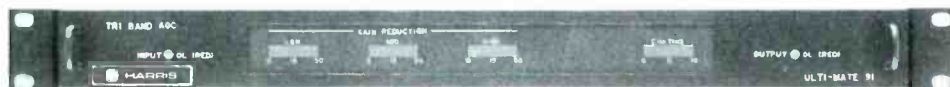
Noise: -64 dBm, 3 Hz to 30 kHz
measurement bandwidth.

Power Requirements: 117 or
234 volts AC, 50/60 Hz.

Flutter Reduction: Greater than 4:1.

Delay Corrections: To within
16.6 microseconds.

Meters: Two VU and one multimeter.



Ulti-Mate 91™

Ulti-Mate 91™ Tri-Band AGC Compressor

- For AM, FM or TV.
- Improves performance of leading audio processors.

- True linear VCA gain control for consistent sound.
- 110 dB dynamic range for ultra-quiet operation.

PX-91 Mastering Quality Phono Preamplifier

- Extremely low transient intermod, dynamic distortion and noise — assuring faithful reproduction of even the most demanding disc cuts.
- Precisely accurate RIAA response curve to less than $\pm .25$ dB error.
- Ultra-clean high-end audio sound quality.
- Conservative operation of all components provides excellent reliability.



PX-91

Rack Cabinets

RAK-90

19" x 70" panel mounting space/
25-1/2" deep, 78" high.

RAK-91

19" x 70" panel mounting space/
22" deep, 78" high.

RAK-80B

19" x 64-3/4" panel mounting
space/25-1/2" deep, 72" high.

RAK-7

19" x 71-3/4" panel mounting
space/19-1/2" deep, 78" high.
Complete with side panels.

Rack Accessories

Side Panel Kits — Available for RAK-90, RAK-91 and RAK-80B, two panels per kit.

Front Trim Kits — For one, two, three or four racks. Fits RAK-90, RAK-91 and RAK-80B.

Plugmold — Provides 10 AC outlets for rack equipment.

Blank Panels — 19" rack panels have modern, black pebbletex finish and are available in standard 1-3/4" through 10-1/2" sizes.

Only Harris has VHF TV transmitters on the air in every top ten U.S. market. Why? Because in critical performance parameters, Harris transmitters outperform the competition.



HT 30LS

Platinum Series™ of Solid-State VHF TV Transmitters

Revolutionizing VHF TV technology

- Designed for on-air removal and insertion, all visual and aural PA modules are identical and fully interchangeable.
- Multiple power supplies ensure highest on-air reliability. High efficiency means less heat to manage and lower operating costs. Compact, roll-out design integral to each cabinet for service accessibility.
- Parallel power amplifier cabinets further enhance on-air reliability.
- Separate AC feeds for each cabinet provide a degree of serviceability never possible with conventional single tube final amplifiers.
- Separate fans provide cooling for each cabinet.
- A state-of-the-art visual/aural exciter, designed specifically for the transmitter, provides exceptional visual performance, and audio performance comparable to that in a top FM exciter.
- PA modules designed for very high MTBF.
- A display screen provides both bar graph and digital readout of power, VSWR, voltage and current parameters, plus other data.

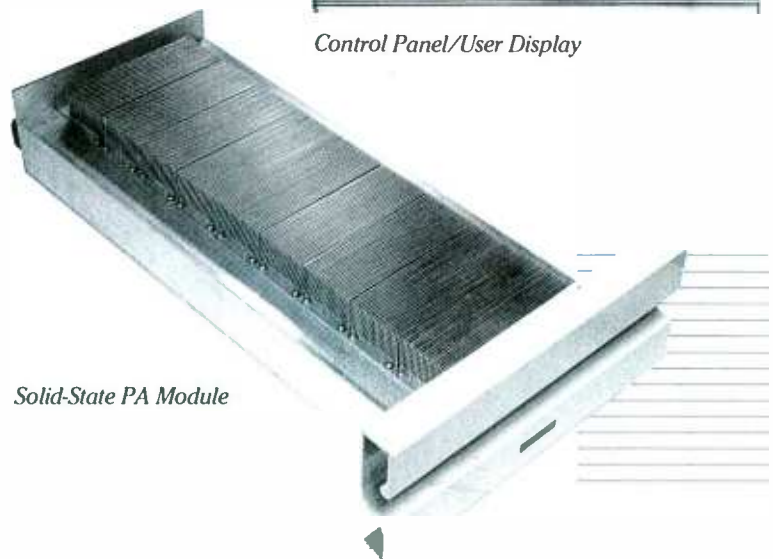
- Simple, straightforward control of transmitter on/off, remote/local control and power raise/lower functions is provided by front-panel pushbuttons.
- Status indicators provide a simple means to observe the condition of all overload and interlock circuits.
- The main control logic circuit provides a central point for control and monitoring of the entire transmitter.
- Individual cabinet logic circuitry provides control and monitoring of the solid-state amplifier modules.
- Interchangeable visual and aural driver modules for user convenience.
- A full range of power levels is available (high band and low band) up to 60 kW.

KEY OPTION

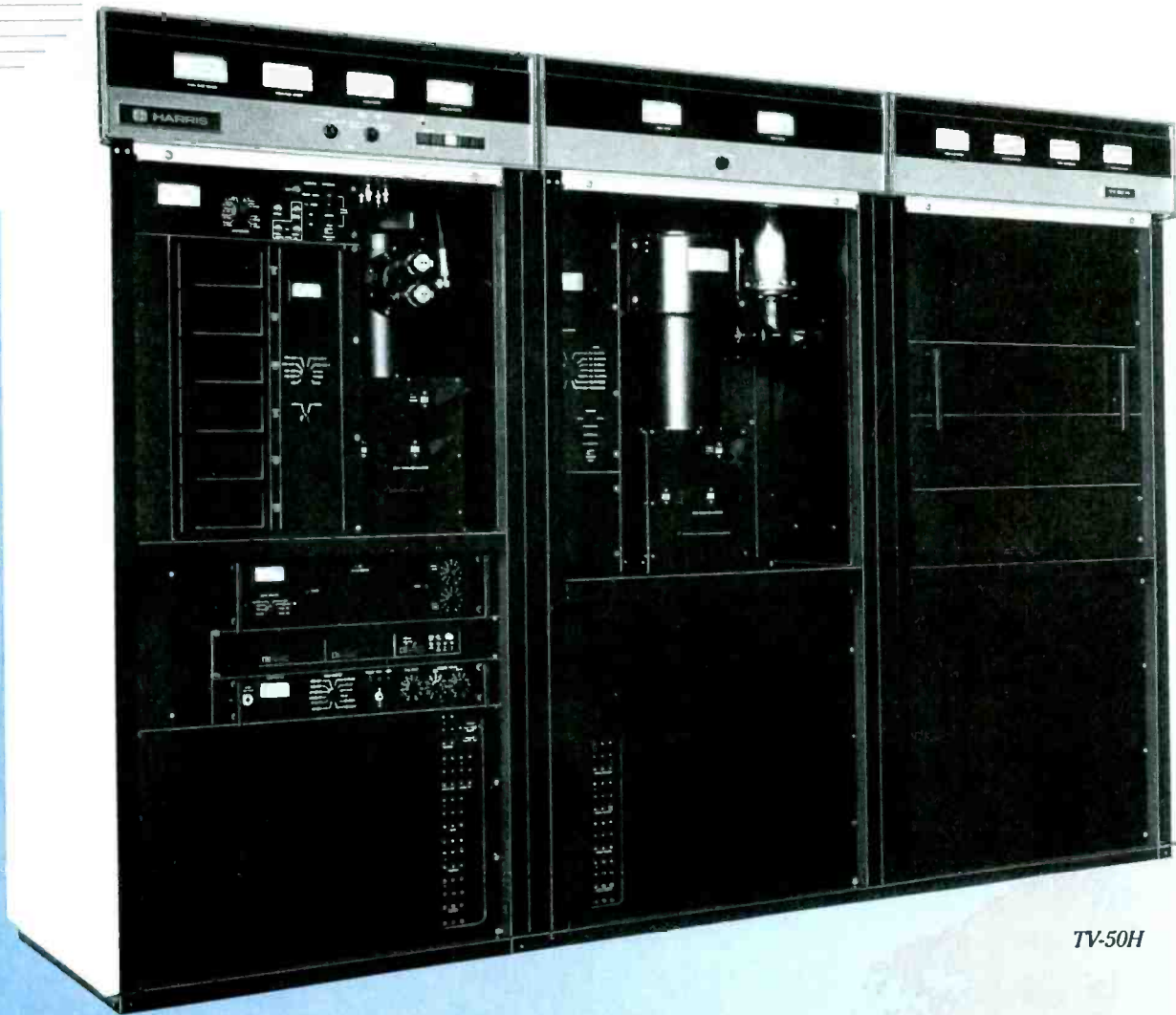
Dual Exciters — For the ultimate in on-air reliability, a fully redundant exciter and exciter switcher system are available.



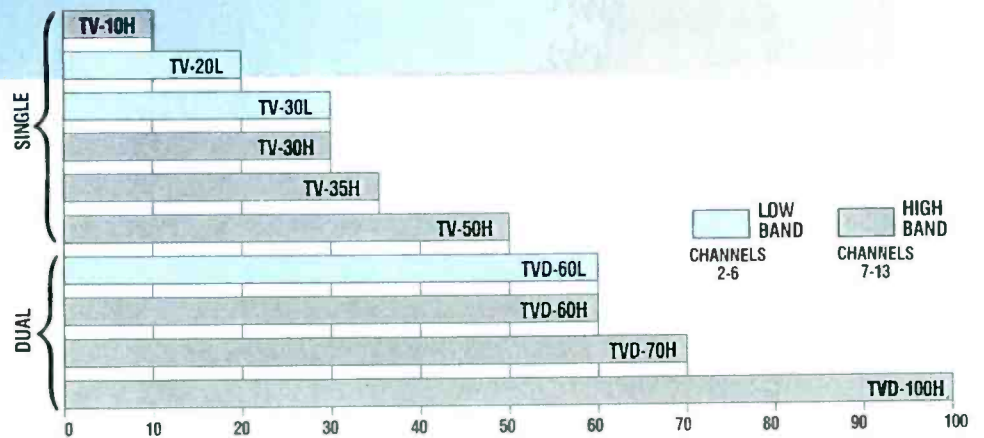
Control Panel/User Display



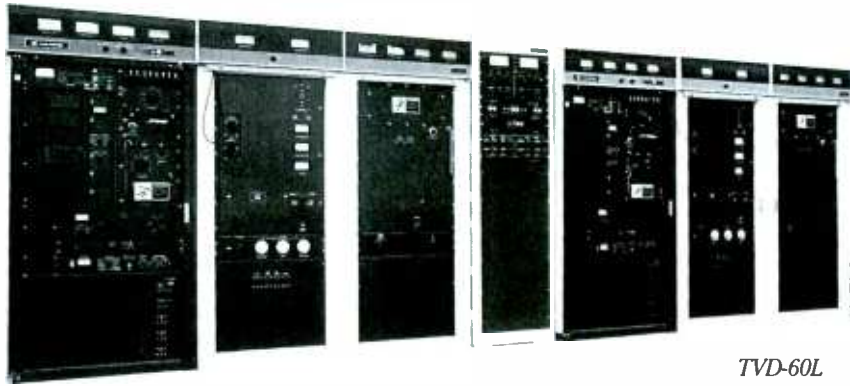
Solid-State PA Module



TV-50H



VHF TV (Tube) Transmitters/Exciters



TVD-60L

The choice of the top ten U.S. markets

■ IF modulation, introduced in the U.S. by Harris over 20 years ago, provides superior visual and audio performance.

■ Rugged, straightforward construction with less complicated circuitry for top on-air reliability.

■ The visual and aural exciters are in independent, slide-out drawers and can be operated outside of the transmitter for test purposes.

■ The MCP-2V visual exciter uses Harris' VIDEO* SAW filter for vestigial sideband shaping and FCC group delay pre-correction. Conventional receiver equalizers that require periodic maintenance with special test equipment are eliminated.

**Visual IF Delay Equalized Output.*

Power Levels Available:

Low Band — 20 kW, 30 kW

Low Band Dual — 60 kW

High Band — 10 kW, 30 kW, 35 kW, 50 kW

High Band Dual — 60 kW, 70 kW, 100 kW

■ The ultra-linear driver stage minimizes the amount of correction required and allows the transmitter to operate over extended periods of time without adjustment.

■ Harris VHF TV transmitters outperform the competition in all critical performance parameters affecting picture quality.

KEY OPTIONS

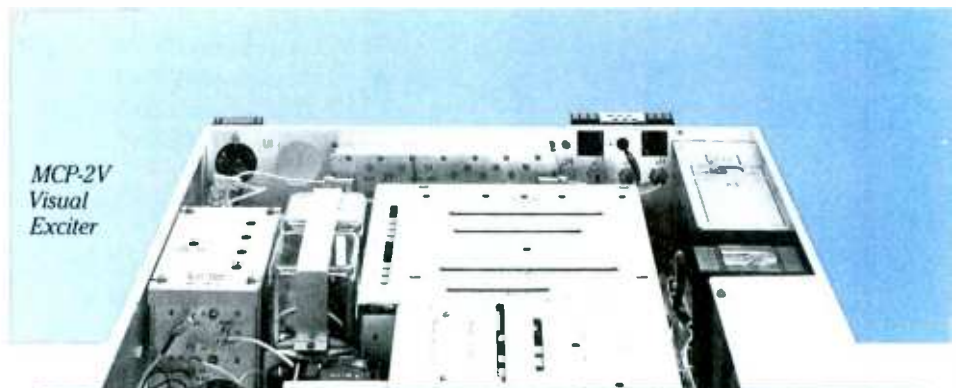
20% Aural Power — Standard on all low band transmitters. Available as a low-cost option for high band transmitters to eliminate distortion and noise problems in fringe reception areas.

Emergency Multiplex — Available in single transmitter configurations. Permits common amplification of the visual and aural signals through the visual RF amplifier chain should any stage of the aural amplifier chain fail.

Notch Diplexers — Dual-cavity stereo notch diplexers ensure the highest quality stereo sound reaches today's discerning viewers.

Dual Operation — Offers total redundancy for flexible maintenance scheduling and no lost air time in the event of component failure.

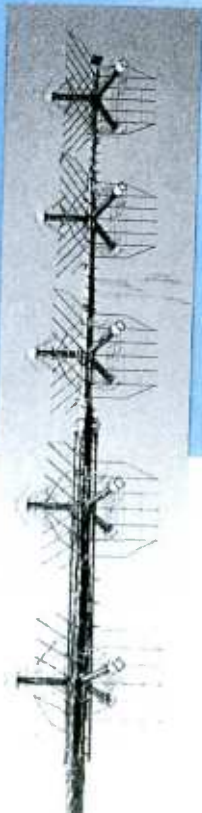
Precise Frequency Control (PFC) — Allows visual carrier to be locked to a precision external frequency reference. Frequency stability is within ± 2 Hz.





TAB Batwing
VHF TV
Antenna

TAV CPV
VHF TV
Antenna



Designed for long life, Harris VHF antennas feature rugged mechanical construction. Corrosion-resistant materials and copper feedlines virtually eliminate reharnessing requirements.

All Harris VHF TV antennas are factory-assembled and tested on Harris' unique far-field test range*.

*Does not include the TAD Deltawing antenna.

Horizontally Polarized

TAB Batwing

- Capable of handling high powers:
 - High Band — up to 77 kW.
 - Low Band — up to 120 kW.
 - High Band Models — 2 through 12 bays.
 - Low Band Models — 1 through 6 bays.
- Top mount design.
- Optimum coverage with selection of horizontal and vertical patterns available.
- Dual 3-1/8", 50 ohm input requires only a simple hybrid diplexer.
- Specially modified TAB-2HP, with 50 kW rating, is available for emergency/standby operation.
- Harris maintains a stock of TAB one- and two-bay antennas for emergency shipment.

KEY OPTIONS

Multiplex (Two or Three Channels)

— Allows stations to share expense.

Electrical De-icing — Calrod heating elements factory-assembled in each radiator.

Top-Half/Bottom-Half Feed — Provides for emergency operation.

Single Line Input — Requires notch diplexer.

Pattern:

- Directional azimuth and wide selection of vertical pattern beam tilt and null fill.
- Pattern measurement of azimuthal and vertical patterns on Harris' far-field range.

TAD Deltawing

- Power rating depends on number of bays, frequency and feed harness:
 - High Band Models — 2 through 12 bays.
 - Low Band Models — 1 through 8 bays.
- Economical — mounts on new or existing tower in stacked configuration. Low windload design.
- Three-around design ideal for triangular-faced towers.
- Excellent horizontal pattern control allows you to place the power where you want for omnidirectional and directional applications.
- Single line input.

KEY OPTIONS

Electrical De-icing — Calrod heating elements factory-assembled in each radiator.

Multiplex (Two or Three Channels) — Allows stations to share expense.

Slot Cover Radomes.

Four-Around Design — Available for square-faced towers.

Support Brackets — For mounting on existing towers.

Notch and Hybrid Diplexers

Circularly Polarized (CP)

TAV-CPV

- Capable of handling high powers up to 100 kW:
- High Band Models — 8 through 16 bays.
- Low Band Models — 4 through 6 bays.
- Top mount design.
- CP provides improved coverage, optimized by excellent axial ratio and pattern circularity.
- Multiple elements provide excellent control of vertical pattern.
- Single line input on high band, dual line input on low band.
- Requires no electrical de-icers.

KEY OPTIONS

Dual Line Input.

Extended Five-Bay Mast — For radiation center equivalent to six-bay, low band Batwing.

TAC CBR

(Cavity Backed Radiator)

- Power rating depends on number of bays, frequency and feed harness:
- High Band Models — 1 through 12 bays.
- Low Band Models — 1 through 6 bays.
- Economical — ideal for mounting on new or existing tower in stacked configuration. Two channels can be multiplexed on same antenna to share expense.
- Excellent horizontal pattern control allows you to place the power where you want for omnidirectional and directional applications.
- Harris' original, proven CP antenna.

KEY OPTIONS

Radomes — For ice protection.

Support Brackets — For mounting on existing towers.

Notch Diplexers

- Dual aural notch cavities for wider bandwidth and excellent BTSC performance.
- No requirement for forced air cooling means increased reliability.
- Designed with minimum insertion loss and low VSWR for optimum picture and sound quality.
- Minimal temperature drift of cavity tuning. Maintains optimum stereo performance with ambient temperature changes.
- Compact design with smaller footprint than previous diplexers. Fits easily into small rooms.
- Notch diplexer equalizer uses all-pass networks. Simple to adjust and provides stable operation.

Hybrid Diplexers

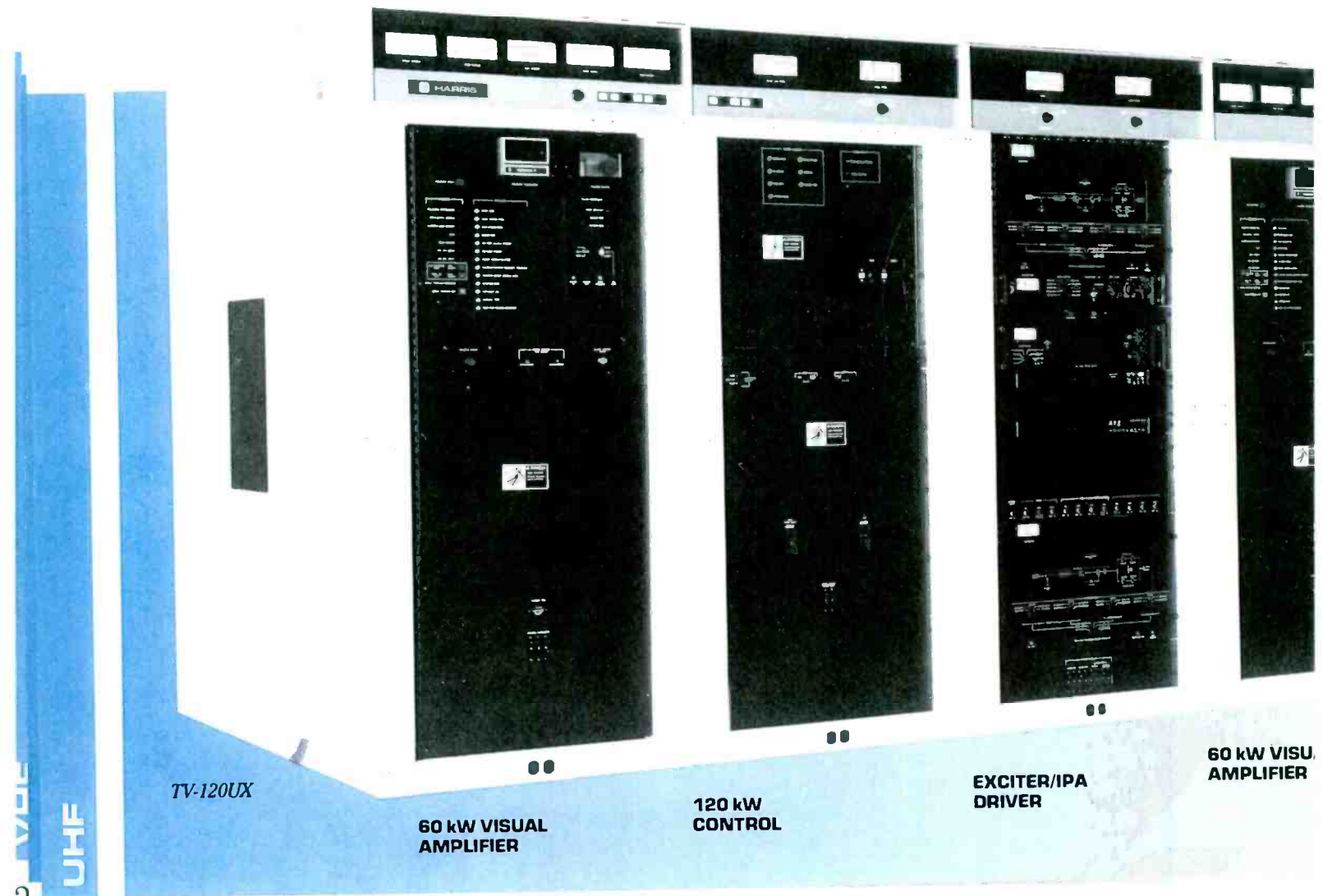
- Low insertion loss for significantly higher efficiencies.
- Low VSWR for best system optimization.
- Compact design fits easily into smaller area.

Power Levels Available: (Notch and Hybrid Diplexers)

High Band: 10 kW through 100 kW,
peak of sync, 20% aural power

Low Band: 20 kW through 60 kW,
peak of sync, 20% aural power

Developed in response to the needs of today's UHF broadcasters, Harris' full line of 60 kW to 240 kW UHF transmitters, antennas and accessories is engineered to deliver exceptional year-in, year-out performance.



TV-120UX

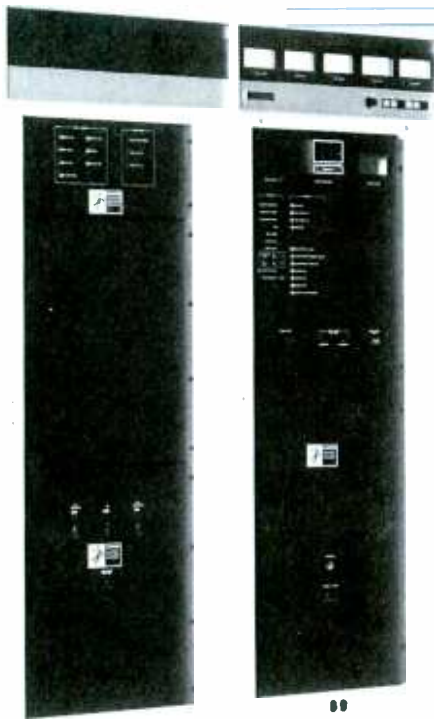
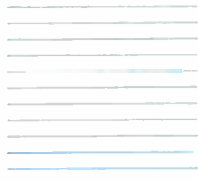
60 kW VISUAL
AMPLIFIER

120 kW
CONTROL

EXCITER/IPA
DRIVER

60 kW VISU.
AMPLIFIER

UHF



60 kW CONTROL

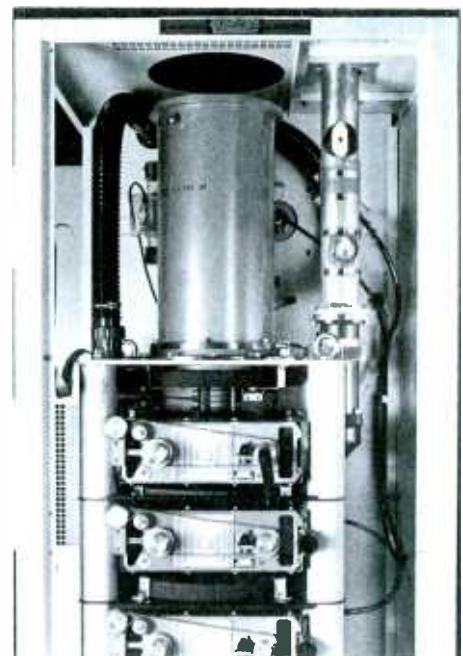
AURAL AMPLIFIER

Top on-air reliability, efficiency and serviceability from day one

- Superior reliability to keep you on the air.
- Excellent visual and aural performance.
- Klystron availability from three sources to ensure lower initial and replacement costs.
- Harris' exclusive two-stage glycol and vapor-phase shell and tube heat exchanger, used to cool the klystron collectors, maximizes reliability, efficiency and tube life.
- Annular ring pulser and exciter sync reduction circuitry for reduced AC power consumption.
- Complete at-a-glance status displays are standard.
- Clear and easy access to all parts and components. Visual and aural exciters self-contained in pull-out drawers.

KEY OPTION

Magic "T" Combiners — Available with 120 kW, 180 kW and 240 kW models. Provide on-air switching, enabling maximum power during failure modes.

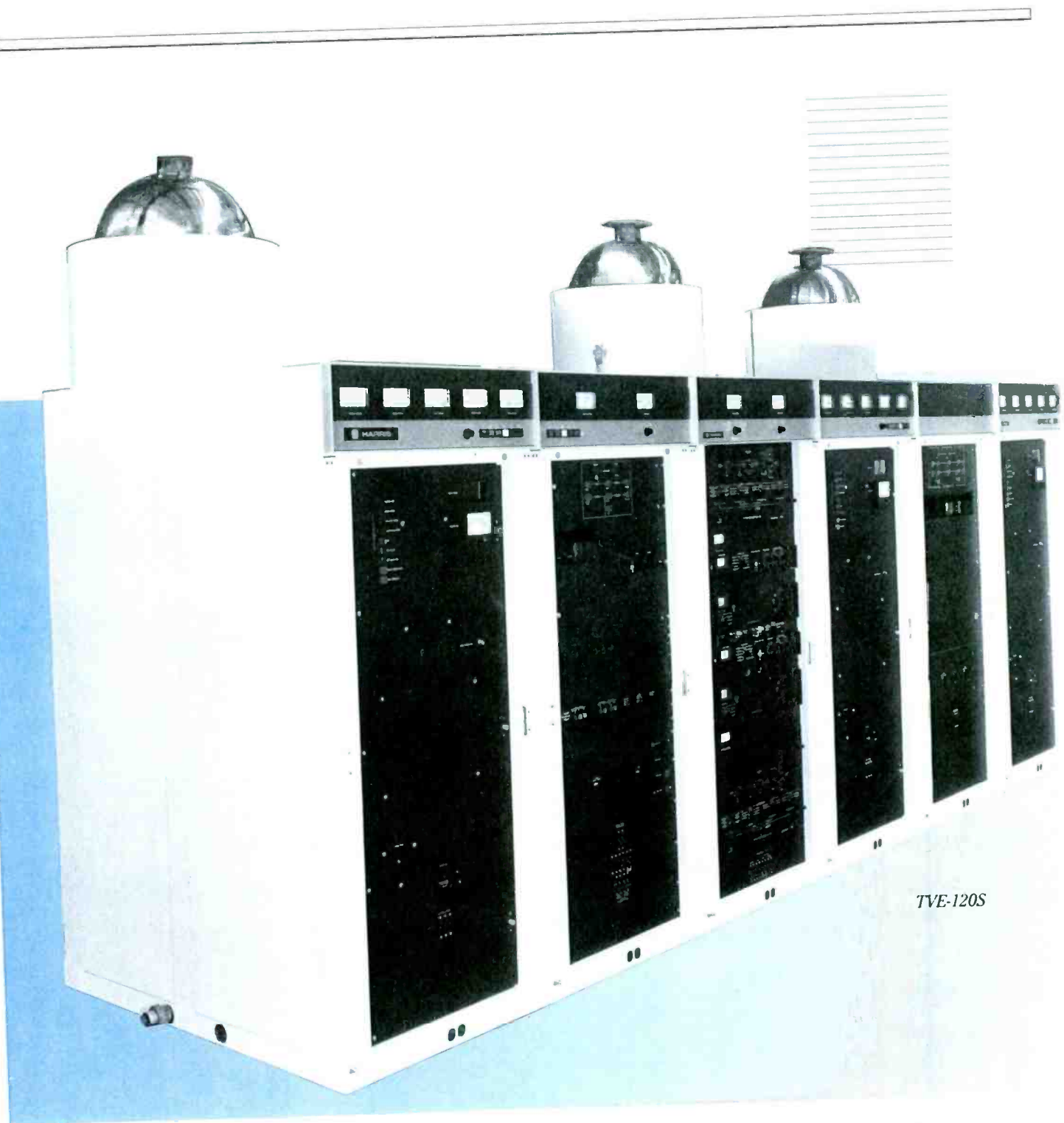


The klystron cavity cooling blower features an air filter for reduced tube maintenance. A separate blower cools the final cavity drift tube. These features provide maximum tube protection and enhance reliability.

Power Levels Available*:

TV-60UX	60 kW
TV-120UX	120 kW
TV-180UX	180 kW
TV-240UX	240 kW

**70 kW, 140 kW, 210 kW and 280 kW models available on request.*



TVE-120S

Power Levels Available:

TVE-60S	60 kW
TVE-120S	120 kW
TVE-180S*	180 kW
TVE-240S	240 kW

**Available on request.*

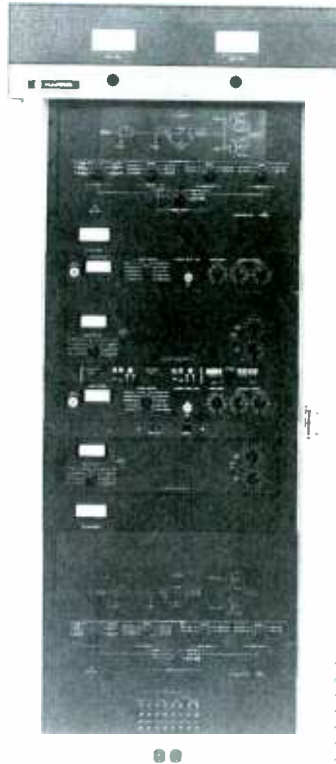
The "S" Family of UHF TV Transmitters (Integral Cavity Klystron)

Using the latest efficiency-improving technologies to help keep operating costs down

- High-efficiency "S" klystron, variable visual coupler and mod anode pulser substantially reduce operating costs.
- Conservative design, parallel solid-state devices, spare heat exchanger . . . for maximum on-air reliability.
- Harris' MCP-2 Maximum Color Visual Exciter and VIDEO* SAW filter — the best in the industry — offer excellent performance year after year, with outstanding video and color specifications and absolutely no realignment.
- Unique LED status panel indicates at a glance whether all IPA modules are operating properly. Integral cavity klystrons are easily tuned and replaced.
- Modular, unitized construction greatly reduces installation time.
- Emergency multiplex is standard on all models. Motorized notch detuners enable local or remote multiplex operation without any RF patching.

*Visual IF Delay Equalized Output.

- All TVE-S transmitters are stereo-ready. Excellent ICPM correction to within $\pm 2^\circ$ ensures optimum performance.
- Highly efficient shell and tube heat exchanger system provides the advantages of vapor-phase cooling of klystron collectors with the reliability of a glycol/water, thermostatically-controlled outdoor fan unit.



The solid-state IPAs and aural and visual exciters are housed in a separate cabinet. Space is available for a spare set of exciters in this cabinet.

KEY OPTIONS

60 kW Diplexer/RF System — Notch diplexer and RF interconnecting line.

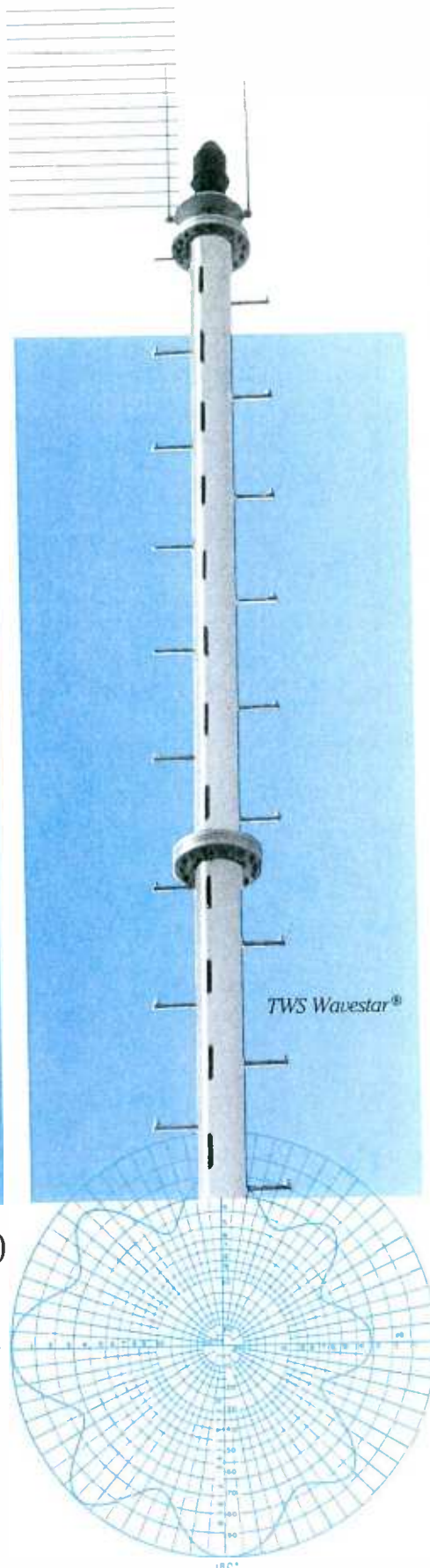
Spare Exciter — Additional visual and aural exciters, and automatic exciter switcher.

REC Spare Parts Kits:

- Semiconductor and Fuse Kit.
- Recommended Service Parts Kit.
- P.C. Boards Kit.

Choice of Three RF Systems for the TVE-120S:

- Standard combiner/diplexer RF system.
- Magic "T" RF system with aural emergency.
- Magic "T" RF system without aural emergency.



Harris TWS Wavestar® and TAZ Quadrapower Horizontally Polarized UHF TV Antennas

- Harris UHF TV antennas are designed for long life . . . featuring rugged construction and corrosion-resistant materials.
- To ensure maximum performance, each Harris UHF antenna is fully assembled and tested at Harris' unique facility, featuring both far- and near-field test ranges.

TWS Wavestar

- Proven reliability with the waveguide design from Harris — the innovator of waveguide antenna technology and still the leader.
- Capable of high-power handling. Standard rating of 240 kW; modified ratings to 360 kW and more; 5 megawatt ERP with ease.
- Wide range of horizontal patterns — omni, trilobe and cardioid.
- Vertical pattern:
 - Omn*, *Trilobe* — Gain of 30 or 25, 30% first null fill, .75° beam tilt.
 - Cardioid* — Gain of 30, 15% first null fill, .75° beam tilt.
- No-cost ice protection, with radome covers or full-pressurized radomes included (depending on model).
- Low windload.
- May be top or side mounted.

KEY OPTIONS

- Inputs** — Coax or rectangular waveguide.
- Full Radome Enclosure for Cardioid** — Extra protection for areas that experience extreme icing.
- Vertical Patterns** — Designs for your specific application.

TAZ Quadrapower

- For applications where a slotted antenna is unsuitable, Harris' TAZ Quadrapower Antenna offers unlimited horizontal pattern control.
- High reliability with a proven design.
- Standard radome covers offer no-cost ice protection.
- Capable of handling powers of 110 kW or greater.

KEY OPTIONS

- Inputs** — Coax or rectangular waveguide.
- Electrical De-icers** — Available on non-radomed Quadrapower antennas.

Medium-Power UHF Antennas

- Available in three patterns — narrow cardioid, peanut and omnidirectional.
- Offer input power rating of 60 kW.
- Designed for side mounting on tower.

Cardioid Pattern*:

- Uses rectangular waveguide as main structure.
- Horizontal gain: 3; Vertical gain: 10; Input power rating: 60 kW, with 6-1/8" input.

Peanut Pattern*:

- Uses rectangular waveguide as main structure.
- Horizontal gain: 2; Vertical gain: 10; Input power rating: 60 kW, with 6-1/8" input.

Omnidirectional Pattern*:

- Uses thin, circular waveguide as main structure.
- Circularity: ± 1 dB; Vertical gain: 8; Input power rating: 60 kW, with 6-1/8" input.

*Gain and Circularity values are approximate.

UHF Diplexer Systems

■ 120 kW Magic "T" RF systems allow you to select V1 or V2 half-power mode without going off the air. Enable half-power operation during a visual klystron failure, instead of quarter power.

■ Motorized notch detuners allow multiplex operation at the touch of a button (standard on all UHF diplexer systems).

■ 120 kW waveguide loads provide higher power capability than with coaxial loads, and higher reliability with no load resistor elements.

■ Unitized construction and compact size make installation into an existing room easy.

■ Capable of operation using the BTSC stereo system. Allows high-performance stereo operation with no additional cost or modifications.

■ Available in 60 kW, 120 kW, 180 kW and 240 kW power levels.

KEY OPTION

Magic "T" Waveguide Combiner/Diplexer with Aural Emergency

— Allows one visual klystron to replace aural klystron if aural klystron fails, for continued on-air operation at half power.

Magic "T" RF Systems

■ Provide multiple modes of operation and hot switching capability.

■ Feature a built-in logic interface between RF system and transmitter.

■ All functions of RF system are remote controllable.

Emergency Multiplex (all transmitters)

■ Allows continued on-air operation following loss of the aural klystron at the push of a button or by remote control.

■ Use of motorized notch detuners eliminates the requirement for manual patching.

■ Combines the visual and aural signals and amplifies them through the visual klystrons at reduced operating power.

Aural Emergency (transmitters with three or more klystrons)

■ Aural emergency mode allows one visual klystron to operate as an aural klystron and enables continued operation at half power.

■ Selectable locally or by remote control at the push of a button.



UHF Exciter
Retrofit Package

UHF Exciter Retrofit Package

■ Updates all makes of older transmitters to state-of-the-art performance.

■ Wideband, linear aural exciter for high-fidelity audio transmission.

■ Provides high stability, low maintenance.

■ Excellent for stereo operation.

■ Special configurations available.

■ Output power is 10 watts visual, 5 watts aural.

KEY OPTIONS

Dual Exciters with Automatic Switcher — For automatic backup exciter protection.

Mod Anode Pulser — Reduces operating costs.

Emergency Aural Multiplex — Combines the visual and aural signals and amplifies them through the visual klystron at less than half of normal operating power.

Shell and Tube Heat Exchanger Retrofit Package

■ Eliminates freeze-up on older UHF TV transmitters by replacing the steam cooling system with Harris' Shell and Tube Heat Exchanger.

■ Based on a water-glycol cooling system, cooling coils can be mounted outdoors, no matter how cold the weather.

■ Outdoor mounting eliminates the need for costly air ducting, exhaust and louver systems, and typically saves 65 square feet of floor space occupied by the exchanger and plenum.

■ Offers built-in redundancy with two pumps and two fans included.

■ Single kit can effectively cool any transmitter up to 140 kW.

■ Includes complete installation by Harris factory representatives.



Sentinel 48 Remote Control System

- An intelligent system that can control changes in your environment without operator intervention.
- Designed for ease of use with simple light-pen operation.
- Competitively priced with flexibility to expand from 16 to 48 channels, status and control points.
- Standard color status indicators provide a simple, visual way to monitor your system.

- Available in a single-site model or multi-site model which can monitor up to six locations from studio.
- Performs up to 50 discrete time functions to allow customized control action.
- Ten programmable series functions for use in handling custom sequence logic in the transmitter plant.
- Four programmable user-display screens available.
- Analog channels can have dual-limits monitoring and alarms with corrective action.

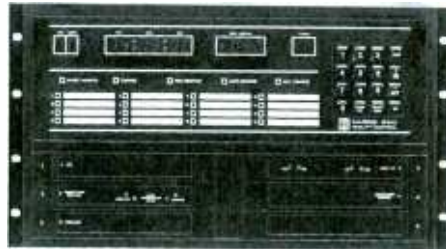
- Status channels can have state monitoring and alarms with corrective action.
- Dual disk drive provides long-term backup of all user-entered programming data for all sites in a system.

KEY OPTIONS

- Logging** — Automatic logging is available at the studio and remote site.
- Auxiliary Sample Units** — Sample units are available for line voltage, temperature and tower current.

9100 Facilities Control

- Microcomputer "building block" system tailored to meet specific applications, from complete automatic facilities control with ATS to simple remote or local control.
- Available in configurations to provide intelligent remote control: automatic transmitter control, automatic logging, plant protection, exercising of standby equipment, and automatic control of items such as tower lights and building temperature.
- Automated transmission system uses automatic control unit for ATS operation with power and modulation control.
- Facilities control handles up to three remote sites from single studio unit, offering control of transmitter, heating, cooling and ventilation equipment, backup equipment exercising and logging, and temperature and intrusion alarms.



9100 Facilities Control

KEY OPTIONS

- Dual Disk Drive Memory** — Eliminates manual loading for reduced operational time. Provides greater system redundancy with hardware backup.
- Disk Memory** — Reduces operational display time. Provides greater software security from having a non-volatile memory in the form of diskettes, which can be reproduced for storage.

Potomac AM-19™ Interface Software Package — Allows you to monitor up to six towers while providing for multiple databases, alarm and failure level limits monitoring, and full logging.

9100 High-Speed Communications Option

- Provides 400% improvement in communications speed for Harris 9100 Facility Controllers.
- Information on monitored alarms and inputs is communicated rapidly to the studio control site for display. Commands are returned with equal speed and accuracy.
- Easy to install.
- Reliable transmission of control information.
- Choice of conditioned or unconditioned telephone lines, two- or four-wire circuits.
- RS-232C industry standard communication interface.

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P.O. Box 4290
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Quincy, Illinois 62305-4290 U.S.A.

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No one company in the broadcast industry offers more total customer support than Harris . . . no one. From helping you select the right equipment for your needs, to providing program management or installation assistance you require, to offering around-the-clock technical assistance, parts support and ongoing training, Harris is committed to keeping you on the air.

Support Before the Sale

- International distributors worldwide, on every continent.
- The largest field sales force of radio and television RF specialists in the United States.
- Experienced technical applications engineers in AM, FM and television.

Around-the-Clock Technical Service

- Telephone technical service assistance staffed by service engineers, 24 hours a day, 365 days a year.
- Experienced service engineers to provide prompt, on-site technical assistance.

24-Hour Service Parts Support

- Telephone service parts line staffed 24 hours a day, 365 days a year.
- Computerized parts inventory for prompt response.

- Close monitoring of each emergency parts shipment to ensure fastest possible delivery.

Program Management, Installation, Check-Outs

- Complete program management services available for turnkey installations.
- Equipment installation available from Harris factory representatives.
- After-installation proof-of-performance and check-outs available.

Comprehensive Training Programs

- Regularly scheduled technical training on transmission systems and products offered at our 7500 square-foot Broadcast Technology Training Center in Quincy, Illinois.
- Five specialized, regularly scheduled courses on RF transmission systems:
 - RF Circuits I.
 - RF Circuits II.
 - AM Transmission Workshop.
 - FM Transmission Workshop.
 - TV Transmission Workshop.
- Training conducted by dedicated staff of degreed and experienced senior service engineers.
- Annual sponsorship of two-week program for international broadcasters through the United States Telecommunications and Technology Institute (USTTI).

- Programs designed to combine theory with practical, hands-on training.
- Programs can be customized and offered at site of customer's choosing . . . anywhere in the world.

Important Harris Numbers:

Radio RF Sales — U.S. and Canada:
217/222-8200, Ext. 3110

Television Sales — U.S. and Canada:
217/222-8200, Ext. 3415

International Sales:
217/222-8200, Ext. 3458

Radio Service (24 hours a day):
217/222-8200, Ext. 3529

Television Service (24 hours a day):
217/222-8200, Ext. 3178

Service Parts — Domestic U.S. (24 hours a day):
1/800/422-2218

International Parts
217/222-8200, Ext. 3498

Program Management/Installation:
217/222-8200, Ext. 3170

Proof-of-Performance/Check-Outs:
217/222-8200, Ext. 3529

Training Programs:
217/222-8200, Ext. 3508

**Harris Corporation,
Broadcast Division**
P.O. Box 4290
Quincy, Illinois 62305-4290 U.S.A.
TELEX: 247319 HARRIS UR
FAX: 217/222-7047

On The Air with Harris

Since its founding in 1922, Harris Corporation's Broadcast Division has set the pace for the broadcast equipment industry worldwide.

From the company's introduction of the transcription turntable in 1926 to its introduction of a digital, solid-state AM transmitter in 1987, Harris has pioneered over 50 technology and service innovations. A rich tradition of providing cutting-edge products and services to broadcasters distinguishes Harris from its competitors.

The Harris difference begins with commitment. Harris Broadcast Division has the largest investment in plants and equipment of any U.S. broadcast equipment manufacturer. But the Harris investment goes far beyond its facilities. Committed to keeping broadcasters on the air, Harris has the largest domestic field sales force of problem-solving radio and television specialists. Harris provides twenty-four hour technical service and parts assistance — an innovation it introduced in 1975. Harris also

sponsors the industry's only Broadcast Technology Training Center at its Quincy, Illinois, headquarters. Offering regularly scheduled programs on major Harris broadcast equipment, a two year degreed college program in broadcast technology, and annual training for foreign broadcasters through the U.S. Telecommunications Training Institute, the Harris Broadcast Technology Training Center attracts broadcasters from around the world. Harris training is also available at the site of a customer's choosing.

With installations in more than 100 countries worldwide, Harris Broadcast Division is a leading supplier of radio and television transmission equipment, including transmitters, antennas, and audio and video production systems. The Broadcast Division is part of Harris Corporation, a \$2.1 billion producer of state-of-the-art information processing, communication and micro-electronic products for the worldwide information technology market.



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