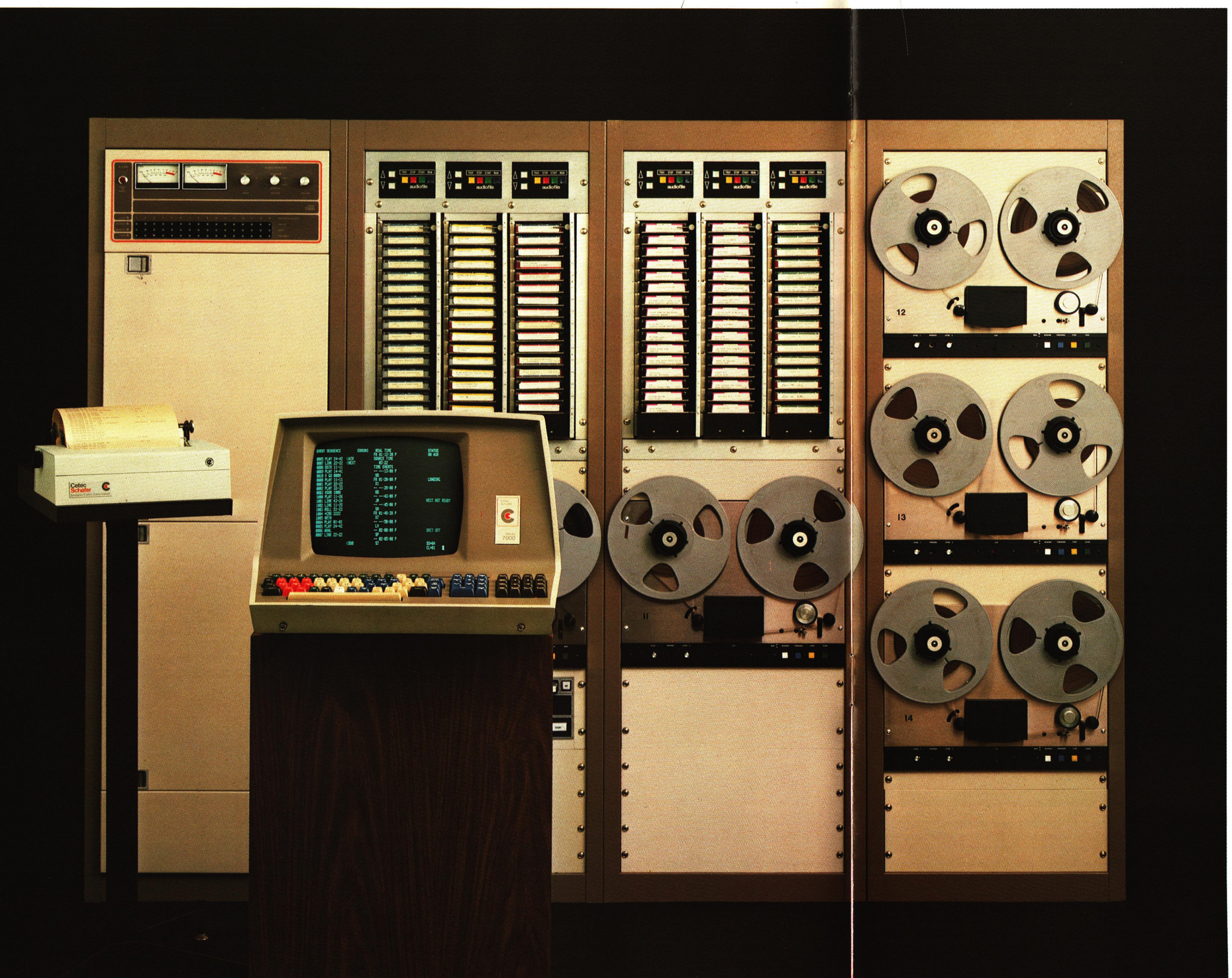
Cetec Schafer Automation System 7000

The microcomputer-based 7000 sets all-new standards for radio automation versatility, quality, and expandability

System 7000: Third-generation microprocessor sophistication human-engineered for ease of operation and fail-safe performance



Now there is a new standard for radio program automation and it is named the Cetec Schafer System 7000.

The role of automation in radio broadcast has changed several times since Schafer Electronics introduced the first system 25 years ago. For a time, some broadcasters used automation as a passive element — simply a way to economize, and to reduce on-the-air staff. History proved that to be a limited view of the possibilities.

A positive role in programming

More than ever, modern automation is a major factor in broadcast economics — but in clearly positive and productive ways. And the most advanced system of all, Cetec Schafer's 7000, contributes to profitability in a dozen ways: absolutely consistent high-quality audio, maximum editing and programming flexibility, long-range plug-in expandability, true computer precision, error-free keyboard interlocking, real-time response, simple operation in clear English, and others.

Sophistication made simple

The 7000 is a highly sophisticated programming and management system — and the third-generation multiprocessor electronics are highly reliable and solid-state. The software is broadcast-dedicated and *built-in* to the firmware in the system. You edit and program the 7000 in English, and it displays its compliance, or asks questions, or advises of errors — also in English.

That's a prime example of the "human engineering" designed into System 7000. It is a system that works for *broadcasters.* Nobody has to be an electronics engineer, or a computer programmer, or any kind of a specialist to program and edit the System 7000. Any member of the station staff can learn to operate the system in a matter of minutes.

The specifics of this remarkable broadcasting system are described and illustrated on the following pages.

Cetec Schafer 7000 "family photo": System 7000 is shown with real-time clock and Verified English Logging subsystems. In foreground at left is VEL impact printer. System video terminal in photo displays *program, edit, time,* and *system status* columns. At rear, from left, are main control cabinet (housing microcomputer, universal source cards, "debug" card, emergency power supply), two Schafer Audiofile II multi-cart systems, and reel-to-reel equipment. Video terminal and VEL printer can be moved to any convenient location.

Cetec Broadcast Group

System 7000 is ready to grow when you are

The Cetec Schafer System 7000 comes complete with microcomputer power; 1000-event memory; capacity for 16 audio sources; dual stereo program buses; separate, dedicated video terminal — and the ability to expand and diversify almost without limit. It is state-of-the-automation-art today — it will still be state-of-the-art five years from now.

You can expand memory to 10,000 events, 1000 at a time. You can expand to 64 audio sources. You can expand to as many as four separate CRT channels, and an unlimited number of terminals. You can add a logging system. You can add a real-time clock subsystem for precise network feeds or other critical time requirements.

The universal hardware concept in the 7000 design provides the basis for expansion. When you're ready to grow, the system grows with you. Starting with the powerful Z80 microprocessor, the proprietary Schafer microcomputer architecture is engineered to accommodate *tomorrow's* work, not just today's. You already have as much computer and control capability as you'll ever need, whatever the station task.

Super-clean audio: System 7000 has higher audio fidelity specs than any other available automation system. Consistent audio quality, whatever the audio source, is mandatory in any contemporary broadcast situation. The System 7000 universal source cards deliver the station "sound" to its listeners with fine fidelity — whether the source is live, reel-to-reel, cart, or multi-cart.

Dual stereo program buses: Voice-over-music is always balanced perfectly with the 7000, thanks to an *exclusive* dual bus feature. And it's automatic! When the voice comes up, the music is properly mixed to blend with the voice. The buses are easily accessible, so that audio processing equipment can be conveniently inserted in the loop.

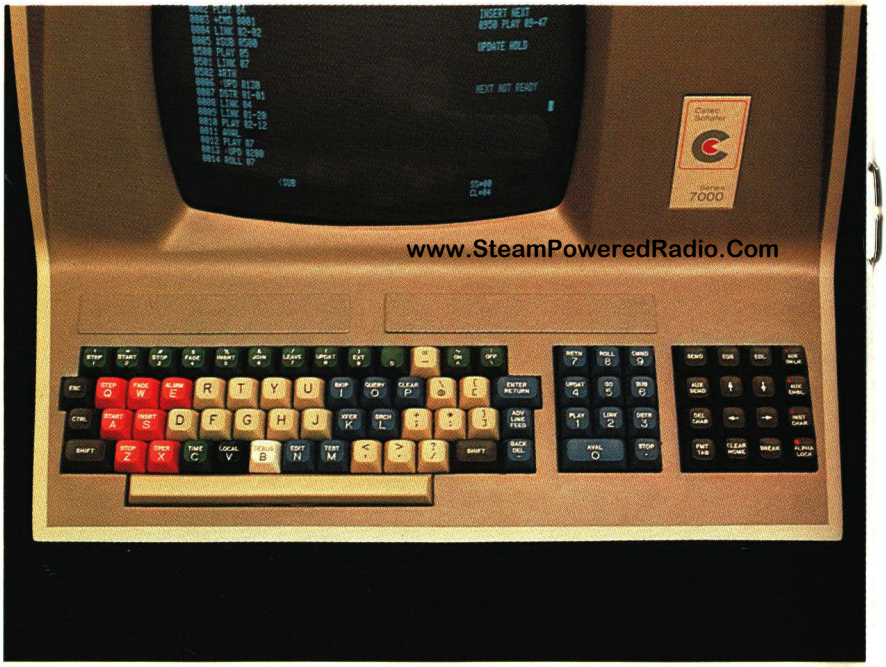
Dedicated CRT terminal is the "conversation piece" of the system. It can be located in the control room — or anywhere else that is convenient. You can add video terminals for different functions — for example, program event-entries can be in process on one terminal, while the program director is editing tomorrow's schedule, or traffic is working on its next-day scheduling on an additional terminal.

Terminal keyboards are color-coded and interlocked — you can't mis-program by accident. When an incorrect or illogical entry is made, the system will advise the operator in plain English on the video display — and await new instructions.

In the editing mode, the system asks for step-by-step verification: Function? Source? Tray? Enter?

Operating the 7000: This system is human-engineered for operation by radio station people. Entries and system responses are displayed in broadcast English, and the system verifies entries step-by-step. The video keyboard won't let you get in the wrong mode. Example: If you are in "program edit," all the other keyboard modes are inoperative.

It's true: any station employee can be taught to operate System 7000 in one hour or less.



7000 Terminal Keyboard Groups at a Glance

System Control Keys (Red)

STEP - Step to next event.
FADE - Fade on-air audio and step to next event.
ALARM - Reset alarm indicators.
START - Start system.
INSRT - Insert last event in memory into next-to-play position.
STOP - Instruct system to stop after source airs.
OPER - Activate all system control keys.

Edit Mode Control Keys (Blue)

SKIP - Skip to next programming entry.
QUERY - Allow entry of new event address.
CLEAR - Reposition display cursor to function position.
XFER - Transfer new address to "next to play."
EDIT - Activate all edit control and function keys.
ENTER - Load entry into memory.
ADV - Advance edit display one event.
BACK - Back up edit display one event.

Function Keys (Blue)

0-9 - Numbers used for source, tray, event.
RETN - Return to main format from subroutine.
ROLL - Start source "off air."
CMND - Special internal system commands.
UPDAT - Identify event as update position.
GO - Go to new event number.
SUB - Go to subroutine.
PLAY - Normal play command.
LINK - Link source to previous source for uninterrupted programming.
DSTR - Double start two sources simultaneously.
AVAL - Clear memory address.
STOP - Format stop request.

Time Function Control Keys (Green)

STEP - Step to next event.
START - Start system.
STOP - Instruct system to stop after source airs.
FADE - Fade on-air audio.
INSRT - Insert last event in memory into next-to-play position.
JOIN - Used for Network Join.
LEAVE - Conditional leave instruction used with Network Join.
UPDAT - Jump program to next update function.
EXT - Activate external relay controls.
ON - Day/Hour marker on.
OFF - Day/Hour marker off.
TIME - Activate all time function and control keys.

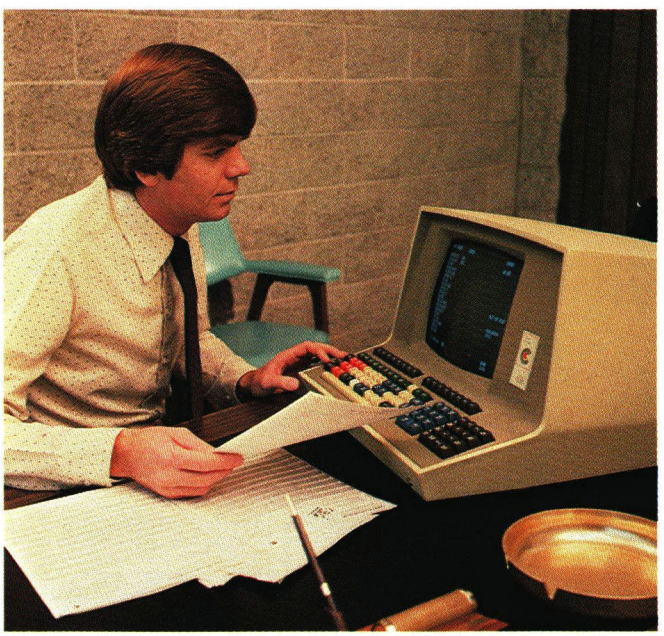
Load/list system for inserting program blocks into the System 7000 memory (seven-day programming, for example) is available as an option. The program is entered into the memory, unloaded onto a digital cassette, then reloaded into the memory at the appropriate time.

Lookahead programming: The program sequence display looks ahead to 19 events at once — you can see the program pattern for several hours at a time simply by advancing the display. Subroutine capability, used for different day-parts or music rotation by category, is just about unlimited.

Real-time subsystem: For format-resetting, network feeds or joins, or any live programming, a real-time clock system is a must. System 7000 offers two options: A timer that provides simple time operations; and a real-time clock sub-system, keyboard programmable, that accommodates up to 100 time events and interfaces with a logging system such as Schafer's VEL (Verified English Logging).

Eleven-at-a-time editing: In the editing mode, the display shows five events ahead and five behind — you can check the continuity, review previous entries, or double-check an entire subroutine.

Error detection and display: System 7000 detects and displays both operational errors (power or transmitter failure, closed loop, memory error, silent sense) and editing errors (adjacent trays, out of range). Operational failures are displayed both on the control panel and the video terminal. Editing irregularities are questioned on the video terminal display, while the system waits for the corrected instruction.



System accommodates up to four terminals. While control room terminal is in the *operate* mode, program director can be editing follow-on programming from his office or other remote location.

1. Operator is editing Event 0004, having accessed via "QUERY" key directly, or stepping to it via "ADV" or "BACK" keys. System asks for "FUNCTION?" (See Function Glossary below.)

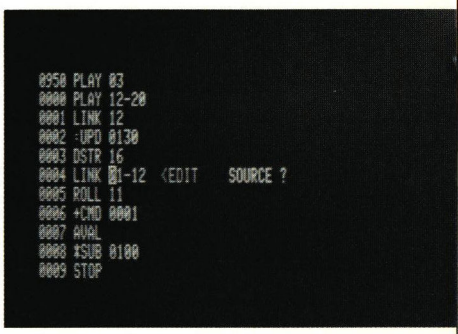
2. Operator selects "LINK" function, which is immediately displayed. System then asks for "SOURCE?" Sources are numbered 01 to 16 (can be expanded to 64 sources).

3. Operator enters Source 03. System identifies it to be reel-to-reel tape, and thus does not request cartridge tray information, but asks "ENTER?" — verifying that selection is to be entered in the memory. Operator depresses Enter key, the event is entered into the memory and displayed, and the system moves to next event to be edited.

4. In this photo, operator has instructed "PLAY 04-02." But the system has recognized that Source 04 will not play back-to-back trays. It sounds a warning "beep" and displays "ADJACENT TRAYS" in the error column. The system asks "TRAY?" once more, and adds a cursor to the source display to allow a corrected entry.

5. In Time Edit mode, the Time Event to be edited is displayed with three previous and three following events. Time displayed in the Edit column is expanded in graph at top of the screen, which shows the seconds, hours, and days this event is programmed. In this case, the event is programmed once each hour of the day, Monday through Friday, at 13 minutes past the hour.

1



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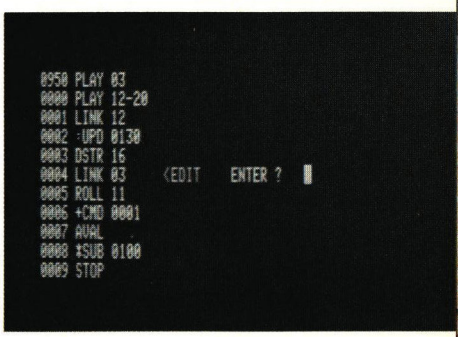

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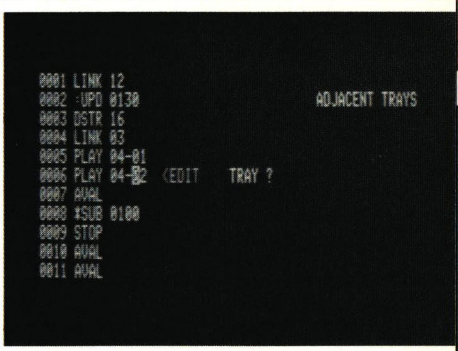

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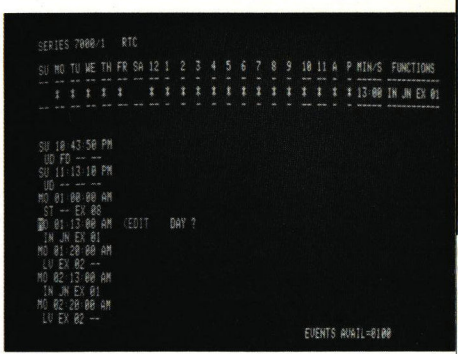

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System 7000: The versatility is almost unlimited

The "debug" card: A diagnostic printed circuit card gives the station engineer the ability to locate and display the source of system irregularities. System 7000 is a modular design, and problems of other than minor significance, should they occur, are most often solved by replacement of the appropriate plug-in board.

Remote control diagnosis: When there is a system problem that defies solution on the scene, Cetec Schafer's 7000 engineers can address the microcomputer directly, via telephone-and-modem link, isolate the problem, diagnose the solution, and start corrective procedures — all in real-time!

Remote control options: Up to four active communications channels can talk to System 7000; and additional inactive video monitors can be installed wherever necessary in the station.

Using a telephone line and modem hookup, a station manager can address the system from his home. The remote control capability opens many other possibilities. The broadcaster can take a terminal with him to the live football remote broadcast; to the major store opening; to the political convention.

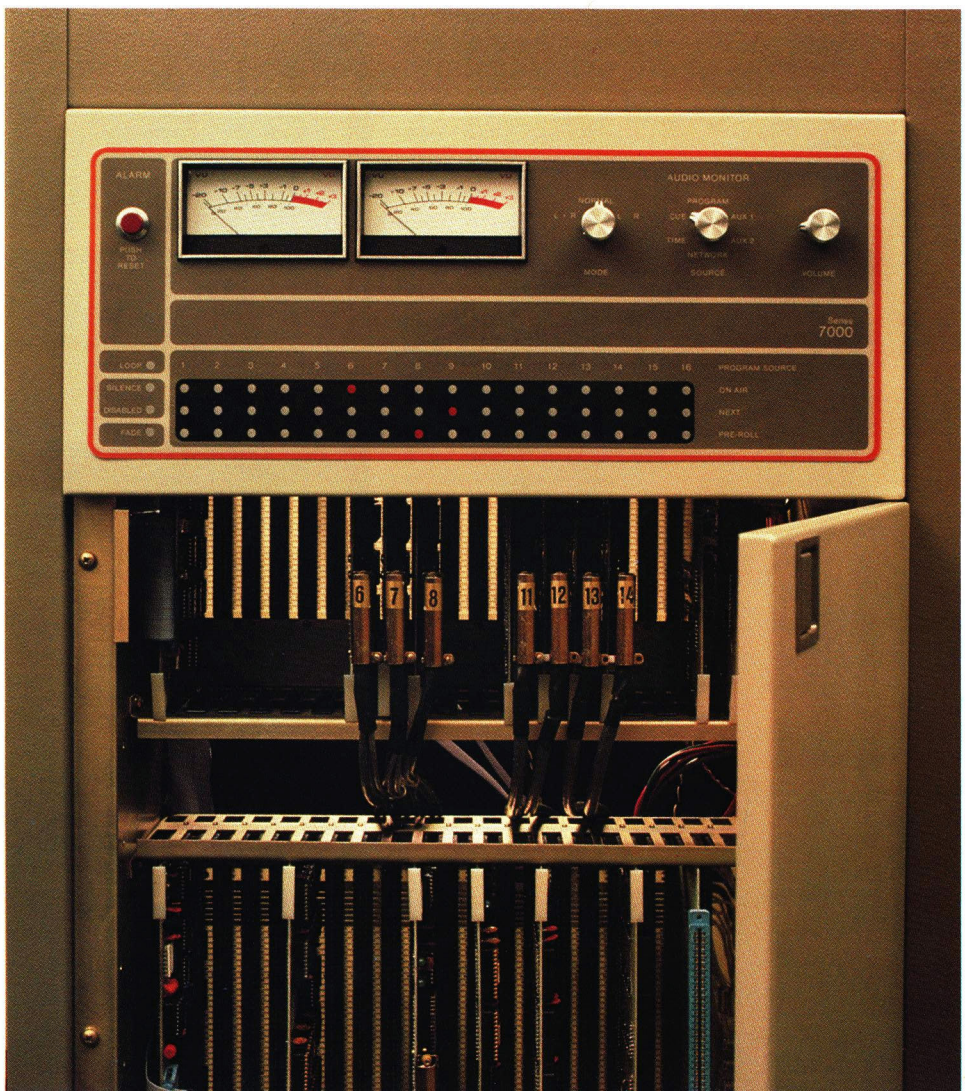
A simpler remote control option consists of a keyboard with which the operator can command "start," "stop," and "step" only.

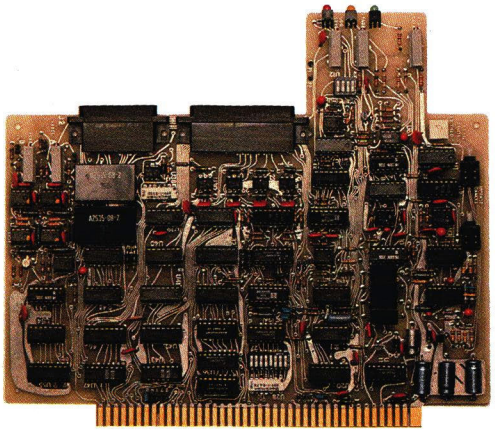
Universal source cards direct "traffic" among the 16 audio sources available in the standard system (as noted earlier, the capability is expandable up to 64 sources at any time). Universal source cards are engineered in three source categories: reel-to-reel tape; tape cartridge, and multi-cart systems. They achieve exceptionally good signal-to-noise ratios. They also provide another Schafer exclusive — System 7000 interfaces with *all* quality audio source equipment. LED displays on the control cabinet provide an instant reading on the source status: on air; next to play; or pre-roll.

The cabinet control panel includes twin vu-meters (left and right); an alarm reset button that draws operator attention to Schafer's exclusive closed-loop and silence-sense controls; an audio mode monitor; volume control; and the source-status indicator display noted above.

Verified English Logging: Schafer's Mark II VEL system is a valuable add-on to System 7000. Its own microprocessor allows VEL to log exact time, source, and description of every event that goes on-the-air — and to note any discrepancies in the program.

Using the System 7000 video terminal, English description of commercials and public service announcements is encoded with 3.5 kH tones on the cue track of each cartridge. When the cartridge is played, the description is decoded and





Above: Plug-in Universal Source Cards are designed for each source category: reel-to-reel, cart, or multi-cart. They permit System 7000 to interface with any quality audio source equipment with excellent signal-to-noise ratios and balance.

Left: Control cabinet panel includes vu-meters, alarm reset button, audio mode monitor, volume control, and source-status display (*on air; next to play, pre-roll*). Lower section of cabinet houses microcomputer master board, universal source boards, debug board, event memory boards — and still has plenty of room for follow-on expansion.

printed on the log. Where no specific description has been encoded, VEL will select the appropriate *fixed* English description from ten that are stored in its memory: station ID, network, voice track, weather, local studio, time announce, network fill music, station jingle, reel-to-reel music, or local news cart.

Discrepancy notations include silence-sense, closed loop, "step now," transmitter carrier "on," and transmitter carrier "off."

VEL firmware interprets time, source, and event data, and drives a high-quality Extel or other printer to produce the log.

Battery-power: A first-quality, computer-grade emergency power supply is standard equipment with the System 7000. It will supply power to the memory for several hours in event of power failure — and as much additional back-up power supply as seems necessary can be added externally to the system — 72 hours or even more.

Cetec Schafer follow-through: For 25 years, Schafer automation systems have been sold with a not-so-secret ingredient: after-sale service. That prompt and thorough back-up policy is stronger than ever. Schafer response is still available on a 24-hour-a-day basis; and Schafer is expanding its field service nationwide.

System 7000 design features themselves aid maintainability: master, memory, source and "debug" cards are all plug-in replaceable, and there is the remote "diagnosis" feature in which Schafer customer service people "talk" to your system directly via telephone-and-modem link.

The Cetec Schafer System 7000 is a highly sophisticated broadcast system that keeps its complexities to itself — in order to present a very versatile, expandable, precise, and easy-to-operate advantage to any radio broadcaster.

It's an addition that will contribute more than its share to station profitability — by improving audio quality and consistency and reducing the chances of inadvertent human error in repetitive, mechanical tasks.

It's a system that will enhance any broadcast format by delivering the broadcast product exactly as it was designed. System 7000 takes you flawlessly through day-part transitions and in and out of network events and other live inserts.

It's a system that programming, traffic, and management can accept, because it benefits all three — measurably.

It's a wise investment for today's competitive broadcast environment — and it's readily expandable to keep you ahead tomorrow, not just in program automation, but in other station-related considerations.

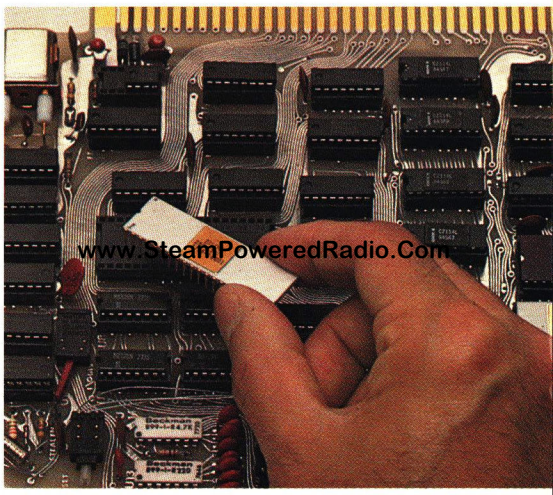
We consider that System 7000 sets all-new standards for program automation — even including the nearly 1000 fine systems that Schafer has produced during the last quarter-century.

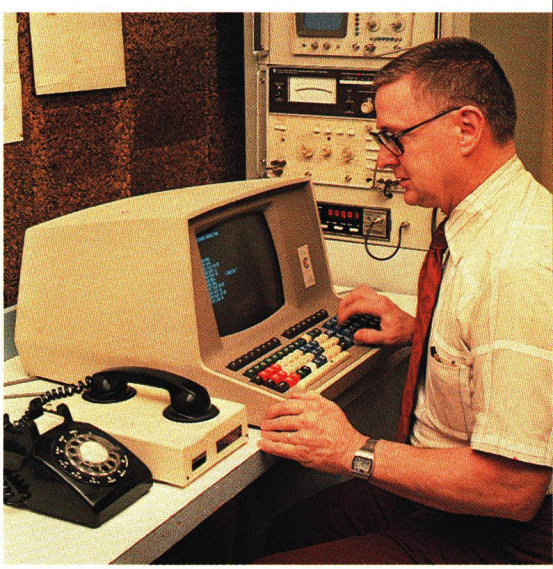
System 7000 is engineered for excellence, priced to be competitive, and designed to grow as you grow. Your further inquiry is invited.

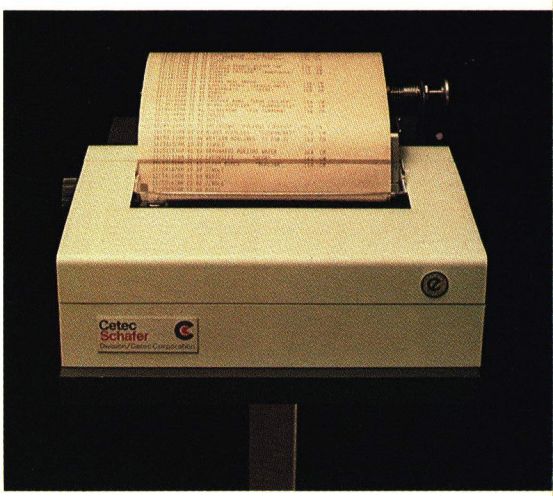
Z80 microprocessor, the powerful third-generation processor from Zilog, is the base for System 7000 proprietary microcomputer design. Microcomputer and master memory functions are on a single plug-in board. The 7000 is a true multiprocessor system.

Center: Using telephone-and-modem link, Schafer engineers can "talk" directly to any System 7000 anywhere in the field, thus providing unique diagnostic service in real time. With phone link, broadcasters can also operate the system from any remote location.

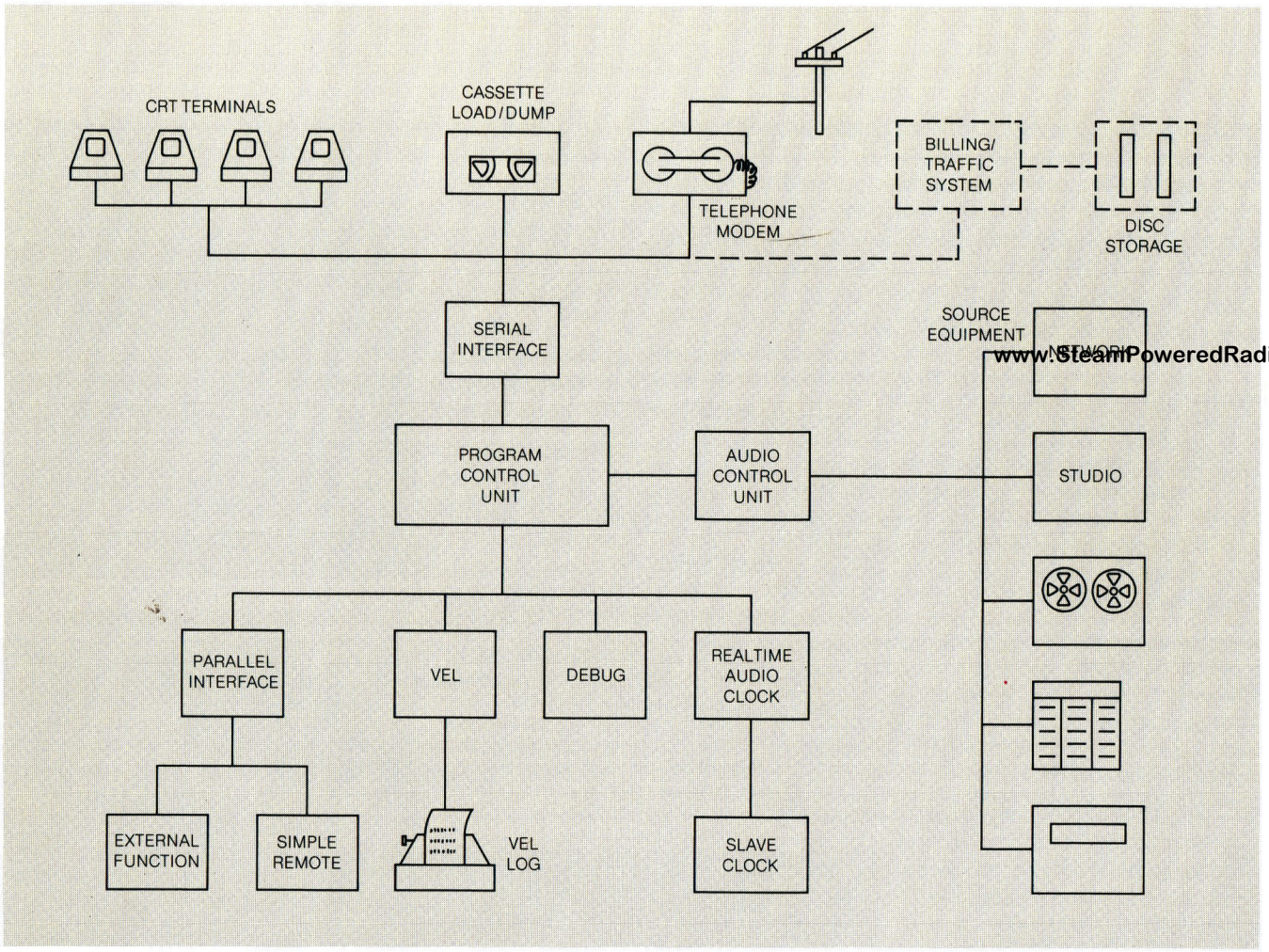
Bottom: Verified English Logging system by Schafer has its own microprocessor. It provides time and descriptive event log, correctly interpreting and editing time and commercial description (from separate data track on carts). VEL drives the impact printer (Extel or other high-quality printer, according to customer specification), to produce accurate log.







System 7000 Block Diagram



System 7000 Audio Characteristics

Frequency Response	± 1 db 50 to 15,000 Hz (including 25 Hz filtering)
Total Harmonic Distortion	Less than 0.5% at + 18 dbm (typically 0.1%)
Line Output	600 ohms balanced (stereo at + 8 dbm), adjustable − 20 to + 8 dbm out
Signal to Noise	− 60 db below + 8 dbm (not including audio source noise)
Filter Response	Greater than − 60 db at 25 Hz (rated at + 8 dbm)
Head Room	+ 10 db above rated output
Monitor Amp Output	Four Watts Stereo

Cetec Broadcast Group
The Broadcast Divisions of Cetec Corporation
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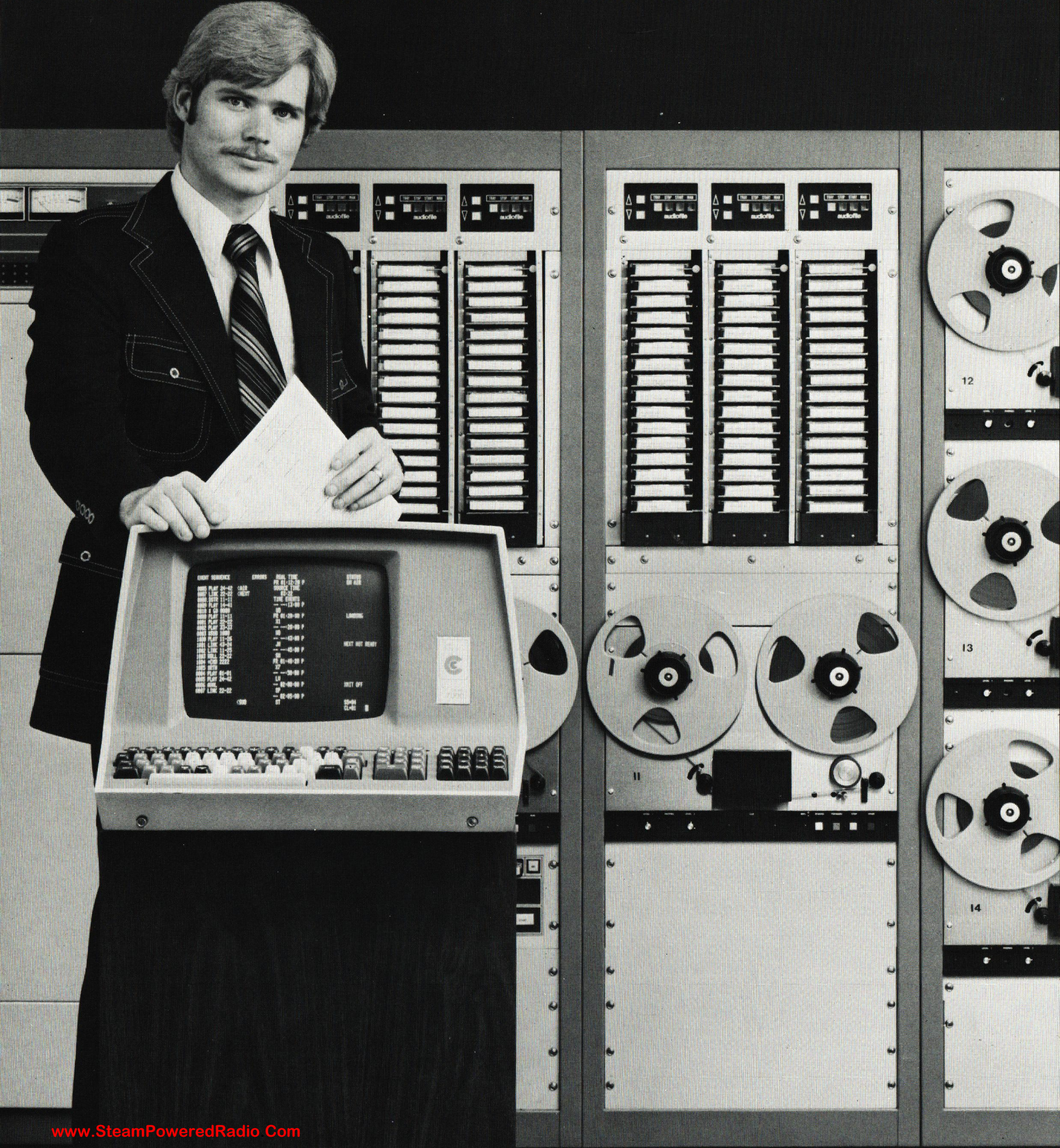

cetec broadcast group

The Cetec Schafer 7000:

Microcomputer power, unlimited versatility, and solid state reliability

Cetec Schafer's powerful new 7000 system brings a new generation to radio program automation. It's a major advance by the world leader in automation systems (with nearly 1000 operating systems in the field).

The 7000 is a complete system now, and it's expandable for tomorrow. You won't replace the 7000 with another system — you will simply expand it, with plug-in firmware boards from Schafer. Five years from now, the 7000 will still be state-of-the-broadcast-art!

Computer power designed exclusively for radio station operations

The third-generation multiprocessor 7000 gives you all the computer power you'll ever need, not only for advanced program automation, but for future station-related assignments.

This microcomputer system and its firmware are *dedicated* to automation and station operations. That means you have instant access to a great automation system at any time, but you're not paying for a lot of unused general-purpose computer time.

Talk to the 7000 in English; it answers you in English

Our video terminal displays information in plain English (with a broadcast accent). You instruct the 7000 in everyday language; it answers you in everyday language — not in "computerese."

The CRT terminal has a customized and color-coded keyboard that's fail-safe — you can't mis-program it by accident.

Take a terminal home for dinner

The 7000 can handle more than one CRT terminal at the same time. You can instruct the system minute-to-minute in the control room, while the program director is editing follow-on programming from his own office!

You can even keep a terminal in your den at home, and monitor the events as they happen, via telephone and modem hookup.

The audio is extra-clean: isn't that what you're selling?

The 7000 produces super-clean sound — after all, that's the end-product your listener receives. Beginning with our own Audiofile II, the 7000 can handle 16 different audio sources (and that's expandable to 64).

The 7000 is ready to grow when you are

Starting with a basic 1000-event memory, the 7000 is expandable to 10,000 events, a thousand at a time.

There are separate channels for additional CRT's; there's a real-time clock option, and others for phone lines, modems, and logging systems. With the phone-line and modem link, Cetec Service Engineers can diagnose any irregularity in the system from hundreds of miles away!

The 7000 challenges broadcast creativity. Yours.

Radio program automation is for technical precision, freedom from error, cost-effectiveness, and improved profitability.

It is also for freeing news and entertainment talent for more productive work than babysitting; building a winning sound and station personality; and for adding depth and color to your broadcast day.

Cetec Schafer's 7000 has an almost limitless capacity for following your commands — instantly, accurately, flexibly, and with an astounding memory. Tell it what you want it to do — and spend your own time on creative management.

For technical specifications and operation information, write or telephone Andy McClure today (805) 968-1561.

Cetec Broadcast Group

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75 Castilian Drive, Goleta, California 93017

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