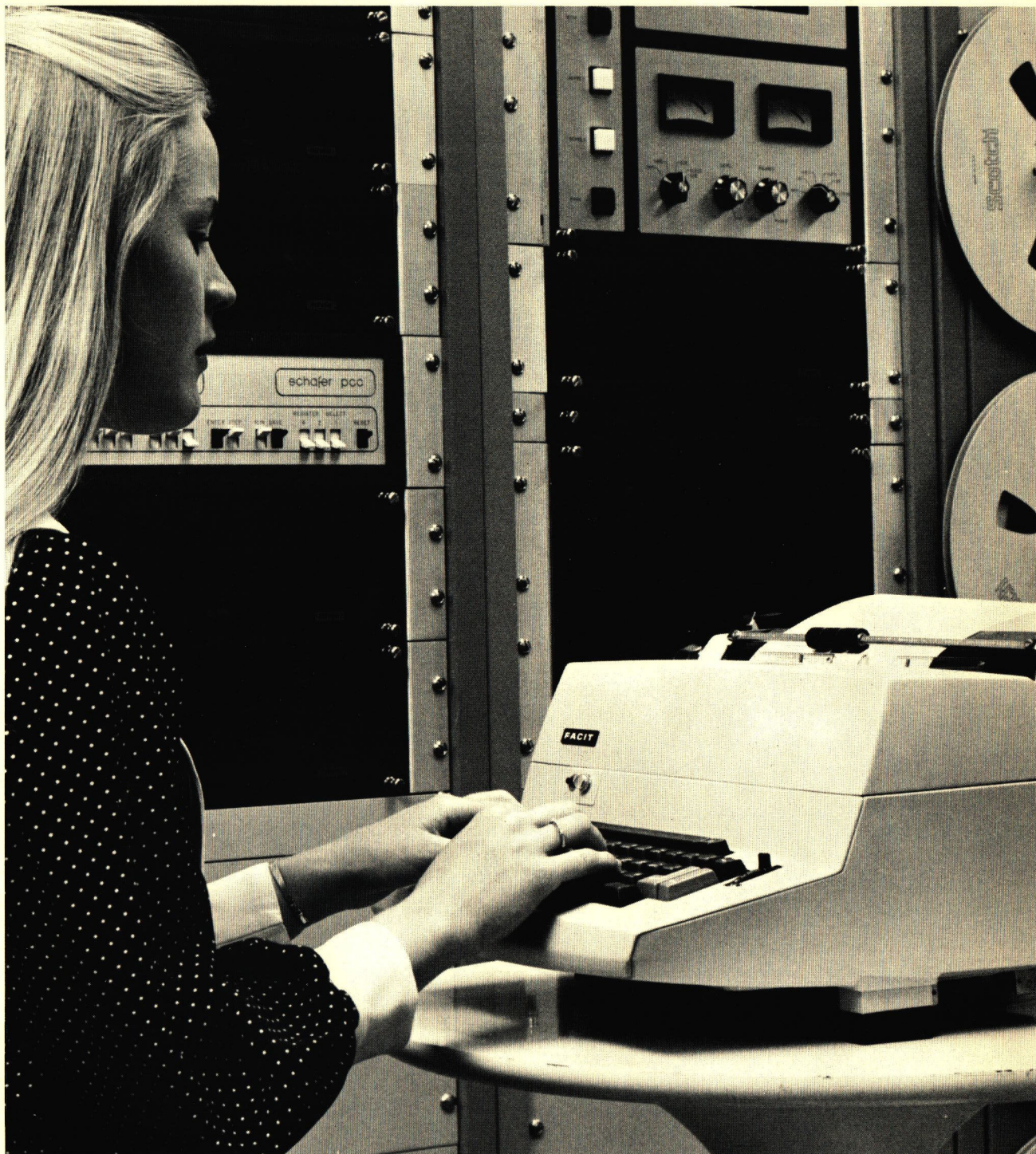# The Schafer Model 8000 Broadcast Automation System
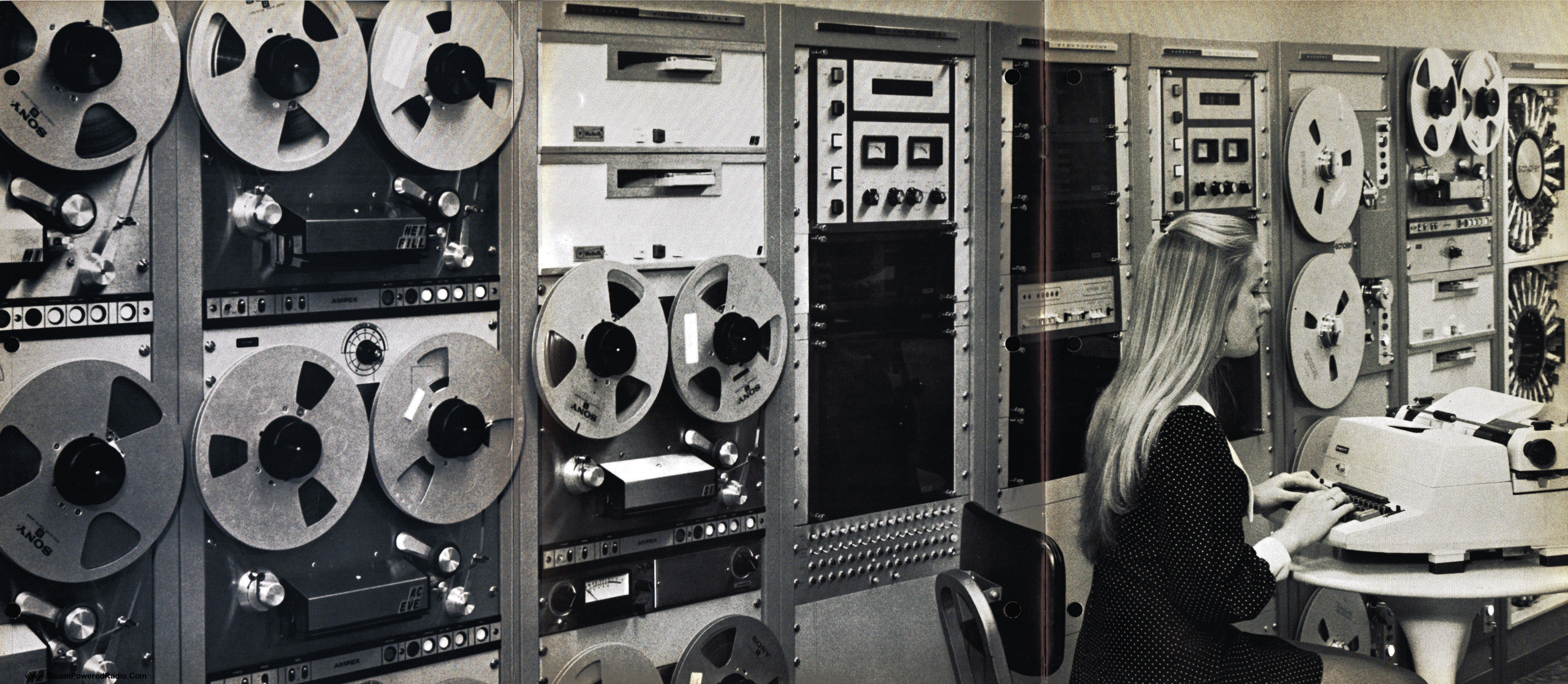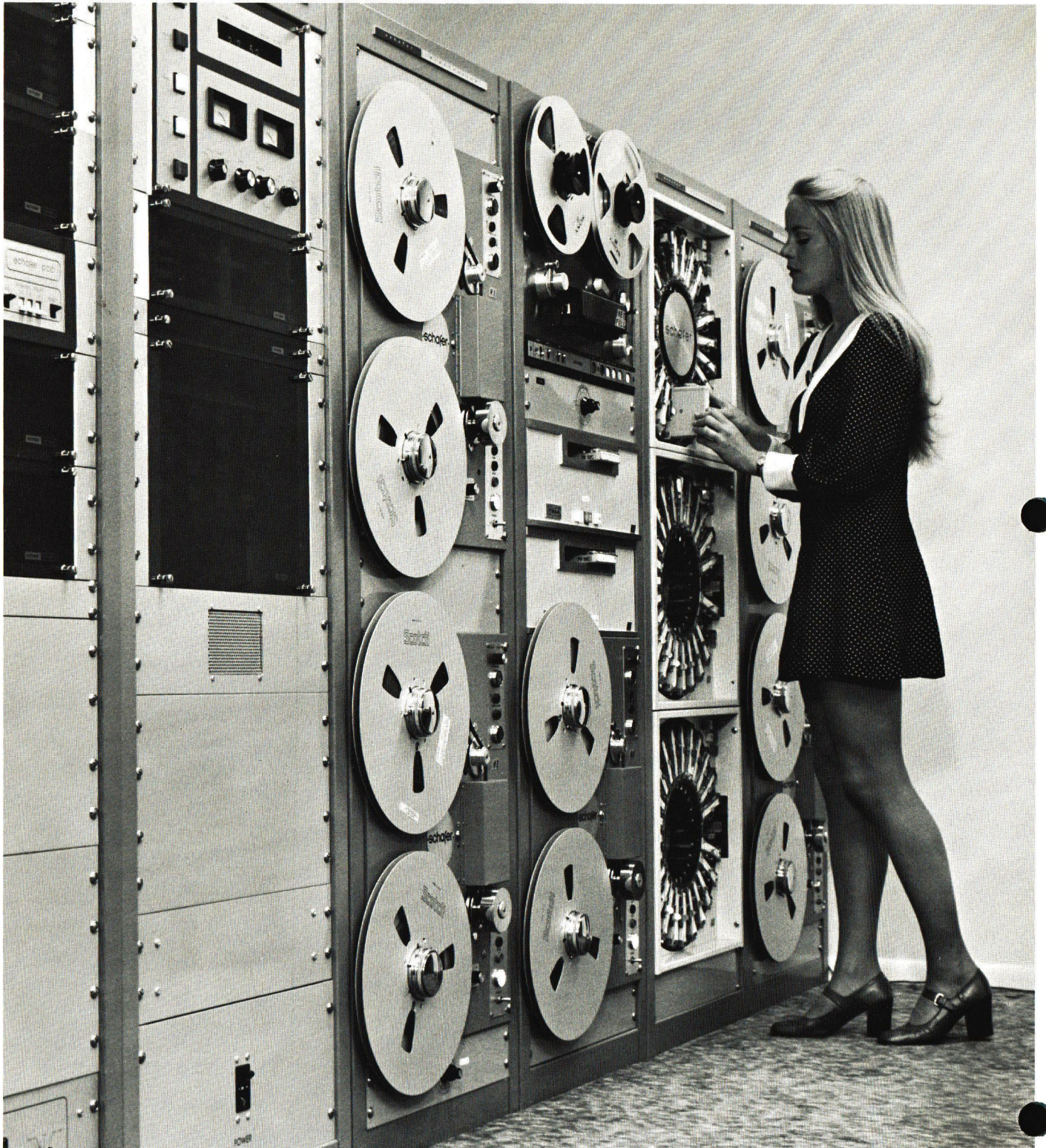
computer-controlled
# efficiency, flexibility and versatility

The Schafer Model 8000

Broadcast Automation System of the 70'S...and beyond.

The Schafer Model 8000 Broadcast Automation System is the only broadcast system controlled by a full-size digital process control computer. Combining advanced computer techniques with our years of broadcast automation experience, the 8000 offers features found in no other system. Here are some of the things it will do for you:

☐ Provide simultaneous yet separate programming for both AM and FM.

☐ Automatically print the program log.

☐ Handle the daily schedule of TIME events.

☐ Handle as many as 48 different FORMATS, each containing 48 events.

☐ Operate the digital clock.

☐ Operate up to 8 random access sources per station.

☐ Operate up to 12 music transports; reel-to-reel, cartridges or cassettes per station.

☐ Switch in and out of network and other program lines.

☐ Operate a transport for fill or closing themes — allowing exact time ending of programs without fading out of program material.

☐ Operate two transports as an audio clock.

☐ Handle many auxiliary events (like transmitter turn on or off) at specific times.

The Schafer 8000 is as simple . . . or simpler . . . to operate than any other broadcast automation system. Yet it has far greater flexibility, capacity and expandability. You simply cannot outgrow it. The 8000 silently and flawlessly runs your radio station (or AM-FM simultaneously) 24 hours a day, 7 days a week — automatically typing out a log of events as they are aired.

Model 8000 Systems have an excellent track record, under actual operating conditions. Since the initial systems were installed, new refinements have been added to further increase flexibility. It's truly the system of the 70's.
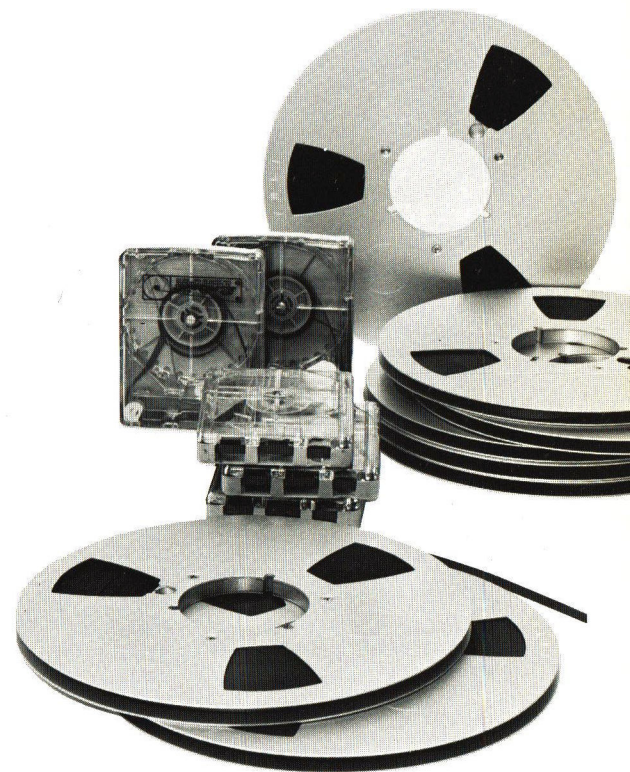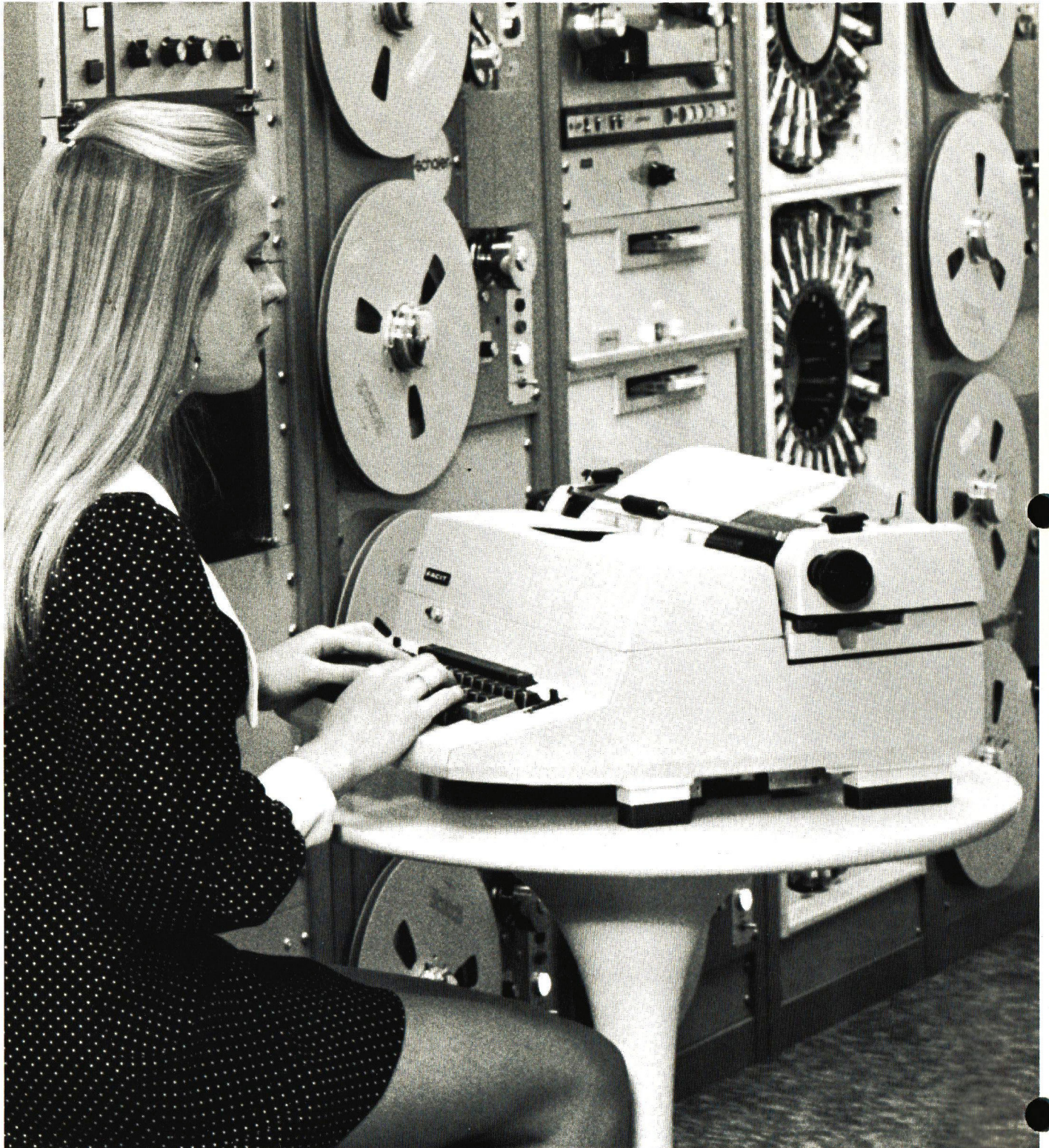
Communicating with the computer

When Schafer engineers set out to design a computer for broadcast automation, they made sure that the system would be so simple that anyone in a radio station can use it with just a few hours of training. Communicating with and instructing the computer is in radio jargon, not "computerese."

The system doesn't use punched cards or complicated computer languages. Anyone who can hunt and peck simple messages on a typewriter can quickly learn to communicate with the system.
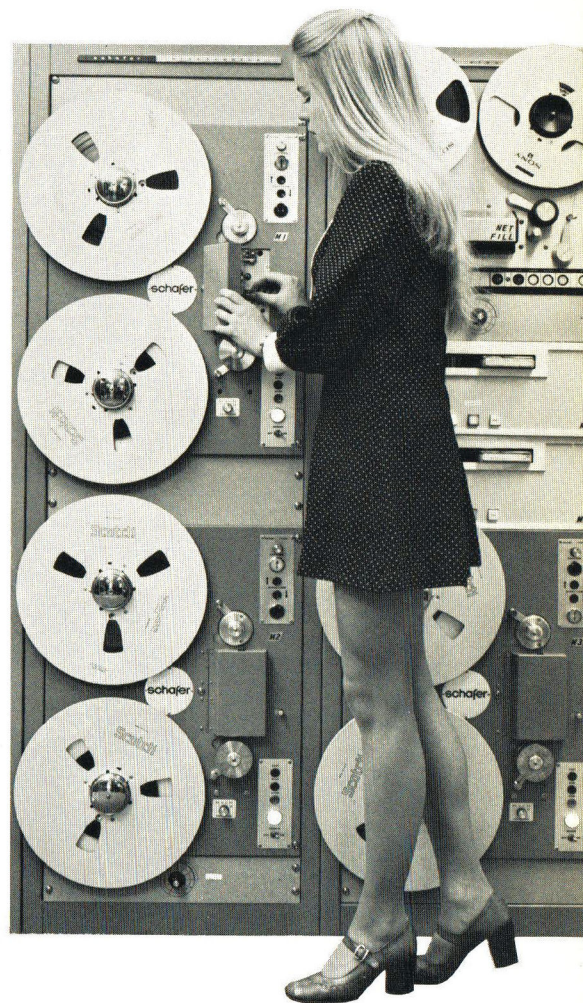
The language we use is called CLEAR (Conversational Language Easily Adapted to Radio). Words such as START, STOP, ENTER, LIST, REMOVE, AVAIL, FORMAT, TIME, FM, AM and so on are used. From the moment you type in HI, until you sign off with BYE, the 8000 is at your command (if you goof in your typing, the computer answers with WHAT?). You can call up formats, time schedules or random access sources and manipulate them at will.
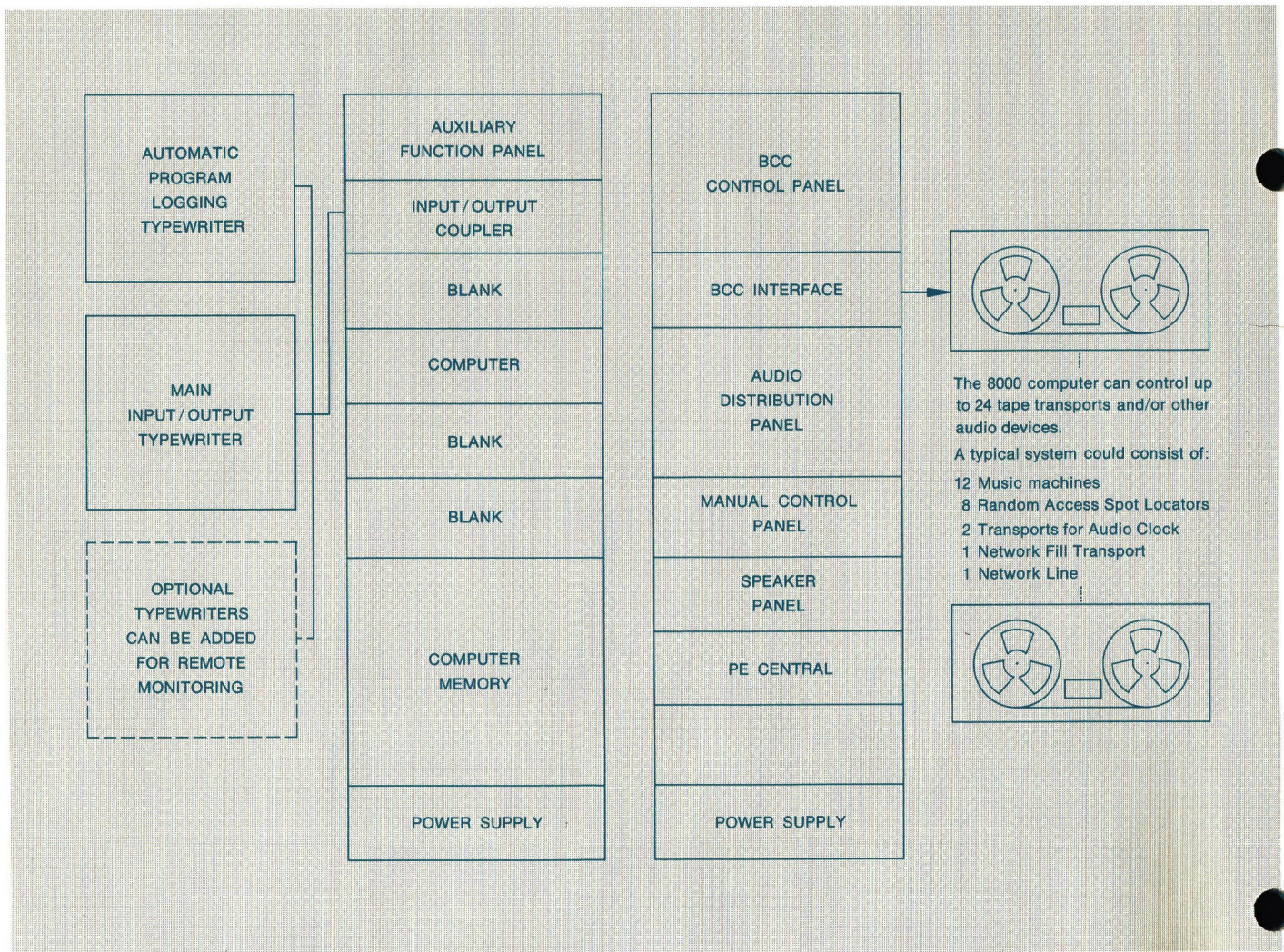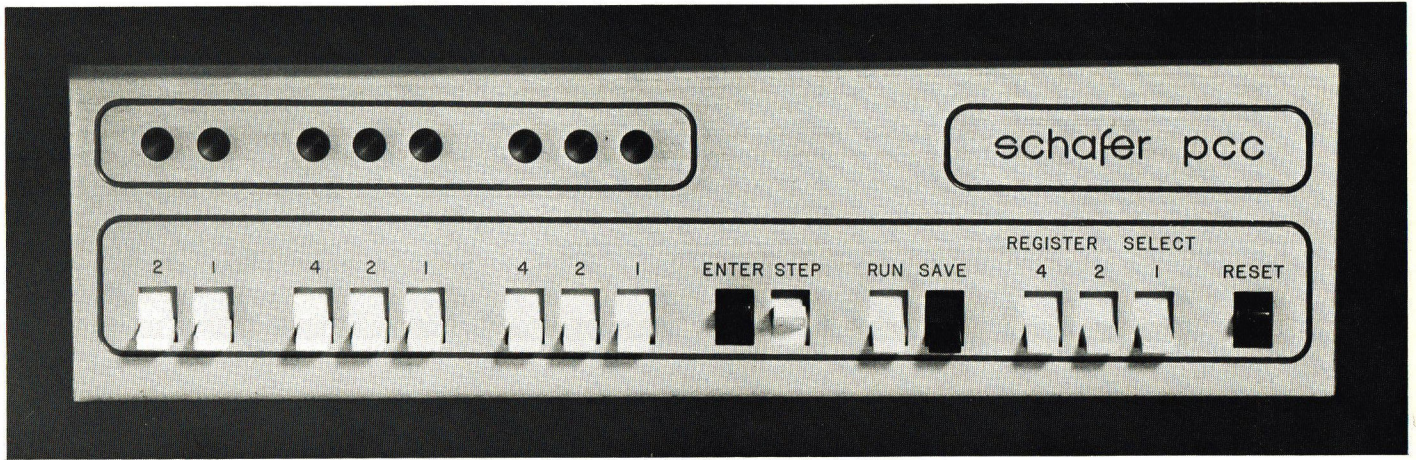
System Components

The Computer Controlling the entire broadcast automation system is the Schafer 8000 computer. Designed by Schafer's own electronic engineering staff to parameters established by our broadcasting and marketing experts, the computer gives the 8000 versatility and flexibility found in no other system or combination of systems. The 8000, including the Broadcast Control Center, the computer itself, the expandable memory, typewriter control, system interface and power supply, is small enough to fit into two 19-inch racks (3 racks for AM/FM).

Up to 24 playback machines (48 for two stations) or other audio sources can be controlled. Formats are virtually unlimited and can be changed within moments. Commercials and other material can be added, deleted and shifted at will. Future days' programming can be updated while the computer is running today's events. And the powerful 8000 can even run both an AM and an FM station from one control point.

Why Ferrite Core Memory? The Schafer Model 8000 has no equal in the broadcast automation field. Our computer memory with the Broadcast Control and interface occupies little space. But what tremendous capability is packed into that small area. The Schafer Model 8000 has

schafer pcc

| | 2 | 1 | | 4 | 2 | 1 | | 4 | 2 | 1 | | ENTER | STEP | | RUN | SAVE | | REGISTER | SELECT | | | |
| | | | | | | | | | | | | | | | | | 4 | 2 | 1 | | RESET |

AUTOMATIC PROGRAM LOGGING TYPEWRITER

MAIN INPUT / OUTPUT TYPEWRITER

OPTIONAL TYPEWRITERS CAN BE ADDED FOR REMOTE MONITORING

AUXILIARY FUNCTION PANEL

INPUT / OUTPUT COUPLER

BLANK

COMPUTER

BLANK

BLANK

COMPUTER MEMORY

POWER SUPPLY

BCC CONTROL PANEL

BCC INTERFACE

AUDIO DISTRIBUTION PANEL

MANUAL CONTROL PANEL

SPEAKER PANEL

PE CENTRAL

POWER SUPPLY

The 8000 computer can control up to 24 tape transports and/or other audio devices.

A typical system could consist of:

12 Music machines
8 Random Access Spot Locators
2 Transports for Audio Clock
1 Network Fill Transport
1 Network Line

overcome all of the disadvantages associated with switches, steppers and other cumbersome devices which dictate a fixed or repeating format and punched cards that must be stacked in a certain order and manually handled to effect a program change. The combination of small size, vast storage capability and microsecond speeds are just a few of the benefits of the 8000. Add to this . . . random selection of 250 commercials on each of up to 8 random access sources and up to 48 different formats each 48 events long and you have an unequalled combination.

The computer memory has such vast storage capability that you may program the system ahead for an entire week and not have any two segments of time alike . . . commercials, ID's by time . . . join and leave network by time . . . music called for by time . . . or all events called for by sequence if that is your choosing. The flexibility is at your command. In case of power failure the ferrite core memory retains its program information without battery backup.

The Schafer 8000 presents a cleaner appearance and takes up less space due to solid state modular design and integrated circuitry. All you need is the computer and as many transports as required to program your station for the LIVE SOUND you desire.

BCC Control Panel The Broadcast Control Center (BCC) panel contains the digital clock, master switches including Start, Stop, Panic — and meters and switches for system VU metering and aural monitoring. Power supply voltages, 25 Hz and silence sense circuits may also be metered. As an option, individual 25 Hz sensing on each playback deck can be provided, thereby allowing more than one playback to be aired at the same time and provides for automatic cueing when loading new tapes . . . another example of the 8000's flexibility.

Computer Control Panel The Computer Control Panel includes switches to allow direct entry into the computer registers. These controls are locked out and accessible only to qualified station personnel.

Computer Memory Modules The basic 8000 configuration contains an electronic ferrite core memory housed in three modules. Additional memory can expand the system to 8 modules. The amount of memory required depends on many factors — the amount of equipment to be controlled, schedule information required and whether the 8000 is to operate one radio station or AM-FM simultaneously. Memory is field-expandable by simply adding modules.

BCC Control Interface Module This module decodes the computer instructions to the tape recorders in the system, incorporating the necessary time delays and interface circuitry from random access sources and audio clock. The BCC Control Interface module can handle up to 24 channels.
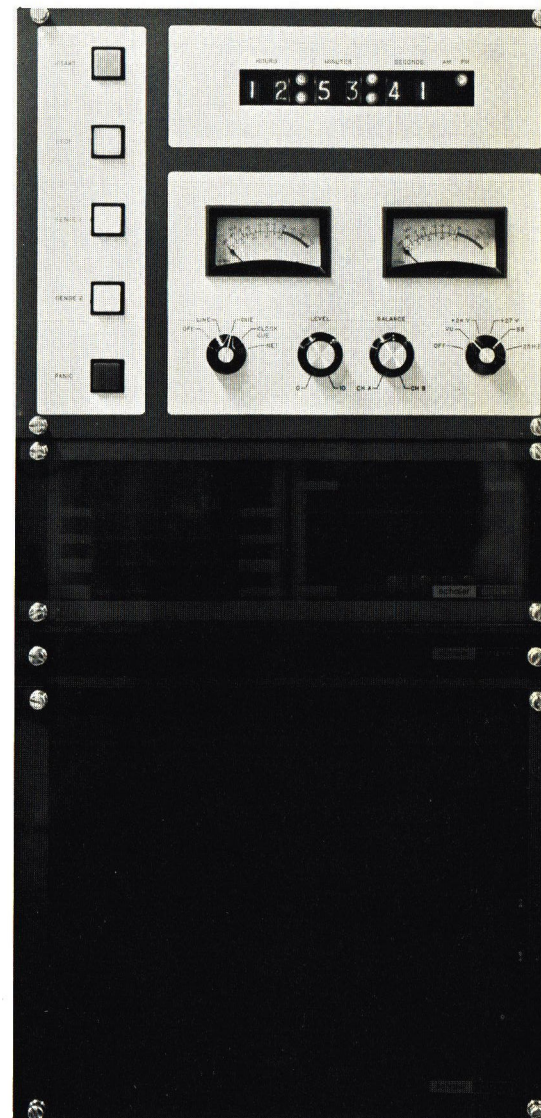
BCC Audio Distribution Module   This module provides the audio input circuitry for up to 24 monaural or stereo channels.

# Input-Output Typewriters...another key to system versatility.

An electric typewriter is the main communications link with the 8000 System. Another typewriter is normally used for the automatically printed program log. Use of the typewriter permits far more versatility than with previous methods. Each day's programming can have unlimited flexibility. Formats can be changed within seconds. Spots can be added, deleted and changed at will. Future schedules can be updated while the station is on the air. All the elements of the most sophisticated system are controlled by the I/O typewriter: music tapes, personality tapes, mood intros, commercials, time signals, station I.D.'s, promos, weather, traffic reports, news, network switching and special programming.

   Available typewriters include: the FACIT Model 3851 which is a standard electric typewriter equipped to electrically interface with the 8000 system as a send/receive unit, and the FACIT Model 3841 which is a receive only typewriter used for automatic logging. Alternately, if you wish the Teletype Models KSR 35 and RO35, they will be supplied.

   The system is supplied with a start-up program specifically prepared for each station. This is easily loaded into the computer memory.

Silence Sense   Silence Sense protects your station against "dead" air. When an event is started and no sound is detected after a short pre-set time, the computer switches immediately to the next event in the format. The silence condition is printed into the log so that the malfunctioning system element can be corrected.

Recovery   With the optionally available battery power, the Schafer 8000 even takes care of emergency situations — like power failure. With battery back-up, the time keeping is kept alive for at least an hour... or longer when more batteries are added. Upon restoration of power, the system knows where it is in time... restart is greatly simplified. In fact, it will restart itself, playing musical selections. The operator needs only to command the computer to re-cue the commercials and set the automatic time announcer. Once the computer is assured that all time-oriented system components are correct, regular operation resumes.
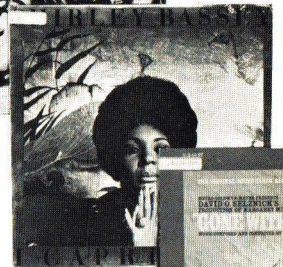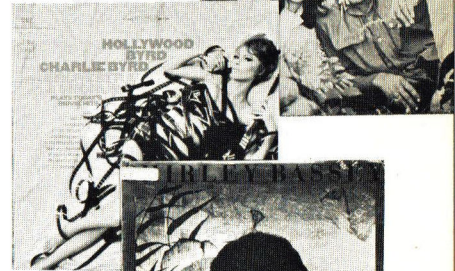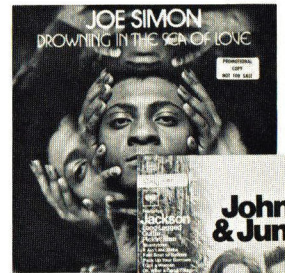
For automatic and *verified* encoded logging

Shown at right is a typical log printout. Particularly note that the time of airing and the playback source are printed from computer information. Identification of what actually played came from digitally encoded signals directly from the tapes being played. This is what we mean by "Verified." Only what actually played is logged. This data can be used directly by the station's billing department, or for affidavits for advertisers and their agencies.

Music Playbacks   Up to 12 sequential music playback decks can be controlled for each of two stations by the powerful 8000 computer. More than ever before, your Schafer automation system can provide music by category. A sequence never has to be repeated. There is almost an infinite number of combinations to create a fresh live sound. The power-ful 8000 system is perfect for any type of musical format — Hit Parade, Middle Of The Road, Country Western, Rock, Contemporary, Classical or Ethnic.

   Any standard relay controlled stereo or monaural transport can be used in the system, either reversing or non-reversing. 25 Hz switching on reel to reel playbacks and 150 Hz on cartridge playbacks are used to assure tight cues and adjustable overlap. Another very important 8000 feature is the built-in time delays which allow the transport to run for a precise time (distance) after the selection is ended in order to by-pass any clicks or pops which may have been introduced during recording.

Cartridges and Cassettes   The 8000 computer provides complete random selection of any multiple tape cartridge device — or can select single-play cartridge or cassette machines when called for in the format.

   Since the computer can control a large number of tape machines — either reel-to-reel or cartridge-type — a radio station now has far more programming capacity and flexibility than ever before.

Audio Clock   The Audio Clock announces the time of day, accurate to the nearest minute. It consists of two self-cueing tape transports — either reel-to-reel or cartridge — one containing all of the even minute time signals, the other with odd minutes.

   Customers can record the time signals themselves or can purchase custom time tapes from Schafer beautifully laid into harp, guitar or other musical backgrounds — one for every minute of the broadcast day.

```
  01:35:31P,LNET
  01:35:31P,FRMT,013
  01:35:31P,RAS5,003        AMPEX #1              :59 NC FJB
  01:36:30P,MU05            KKKK                  :30 ID
  01:37:00P,CLOK
  01:37:09P,MU06            CANADA DRY            :62 NC BBDO
  01:38:14P,MU01
  01:40:48P,MU02
  01:43:00P,FRMT,014
  01:43:12P,RAS5,006        SAC.TO.JUICE          :59 NC DER
  01:44:12P,CLOK
  01:44:25P,MU06            COCA COLA             :62 NC GGB
  01:45:29P,MU01
  01:48:17P,MU02
  01:51:10P,RAS5,001        CONTAC                :58 NC BBDO
  01:52:10P,CLOK
  01:52:27P,MU01
  01:54:43P,MU02
  01:57:47P,RAS5,011        ROM                   :50 NC GGF
  01:58:30P,FRMT,013
  01:58:38P,MU05            KKK                   :30 ID
  01:59:08P,CLOK
  01:59:27P,MU06            VIT                       NC BBDO
  01:59:58P,MU01
  02:19P,MU02
  05:31P,RAS5,009          CO
  06:35P,CLOK
  06:57P,MU01
  09:25P,RAS5,022          DU
  10:22P,MU02
  12:20P,MU01
  3:00P,FRMT,014
  5:14P,RAS5,024
```
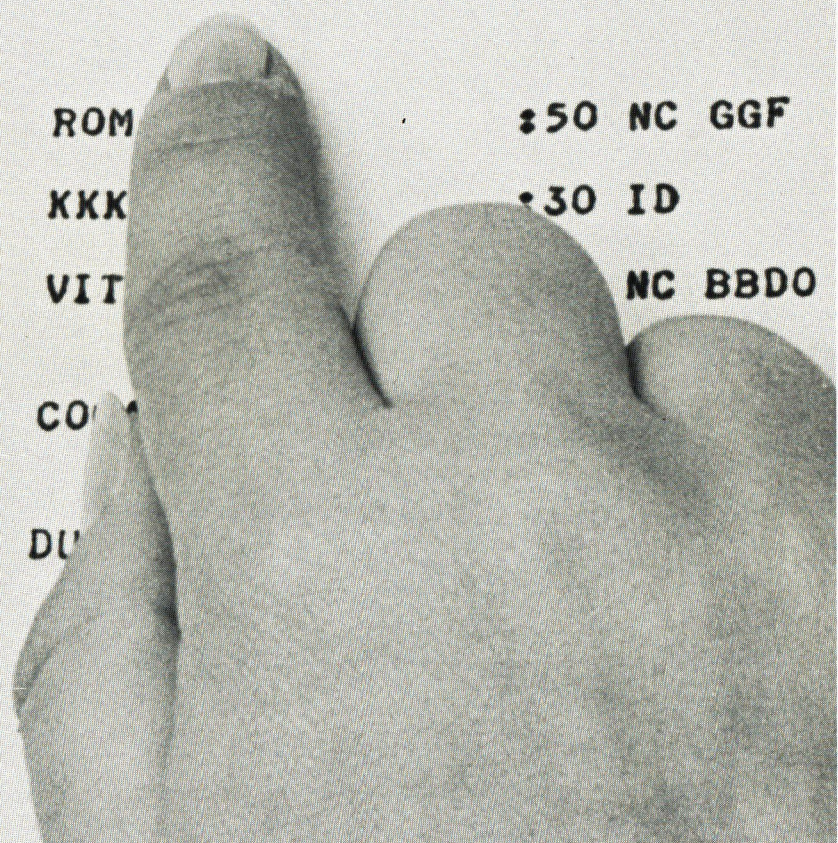
Network Joining/Leaving   The computer can be programmed through the typewriter terminal to join and leave the network at precise times during the day and night. The only piece of equipment needed is a playback tape transport containing "fill" music. Schafer systems have never had to fade out or cut a musical selection before it has finished playing. In the 8000 system, this is accomplished by programming the computer to deadroll the fill music or closing theme so that the music ends in time to play the network agency commercial, the station I.D., or whatever events are scheduled. Timing is controlled so that all of this takes place just prior to the moment the computer switches to the network. With no break in programming, the network is on the air. Normal local programming can be resumed after the computer issues the command to leave the network.

Makeup/Production Unit   The TRU-8 Record Unit is used to record material to be aired by the 8000 system. It may also be used as a playback unit, in or out of the system, and may be used to record material for any other use as well. The 25 Hz oscillator and a sharp cutoff 25 Hz filter are built into the TRU-8 electronics. The 25 Hz filter removes all unwanted low frequencies from the material being recorded, yet the sharp cutoff filter design assures full range fidelity. A remote control unit is provided to allow remote control of all normal recorder functions, plus the special controls designed for recording for the 8000 system.

We Care.   After a system is installed at a station we don't forget you. We're interested in assuring that all is well and that the system is being used to the best advantage. That's why we have our service engineers available 24 hours a day, 7 days a week to aid if operational help or service is required. If an occasional malfunction occurs or some guidance is needed, we encourage the broadcaster to call . . . day or night (at night an answering service will put you in touch with our manager of field service).
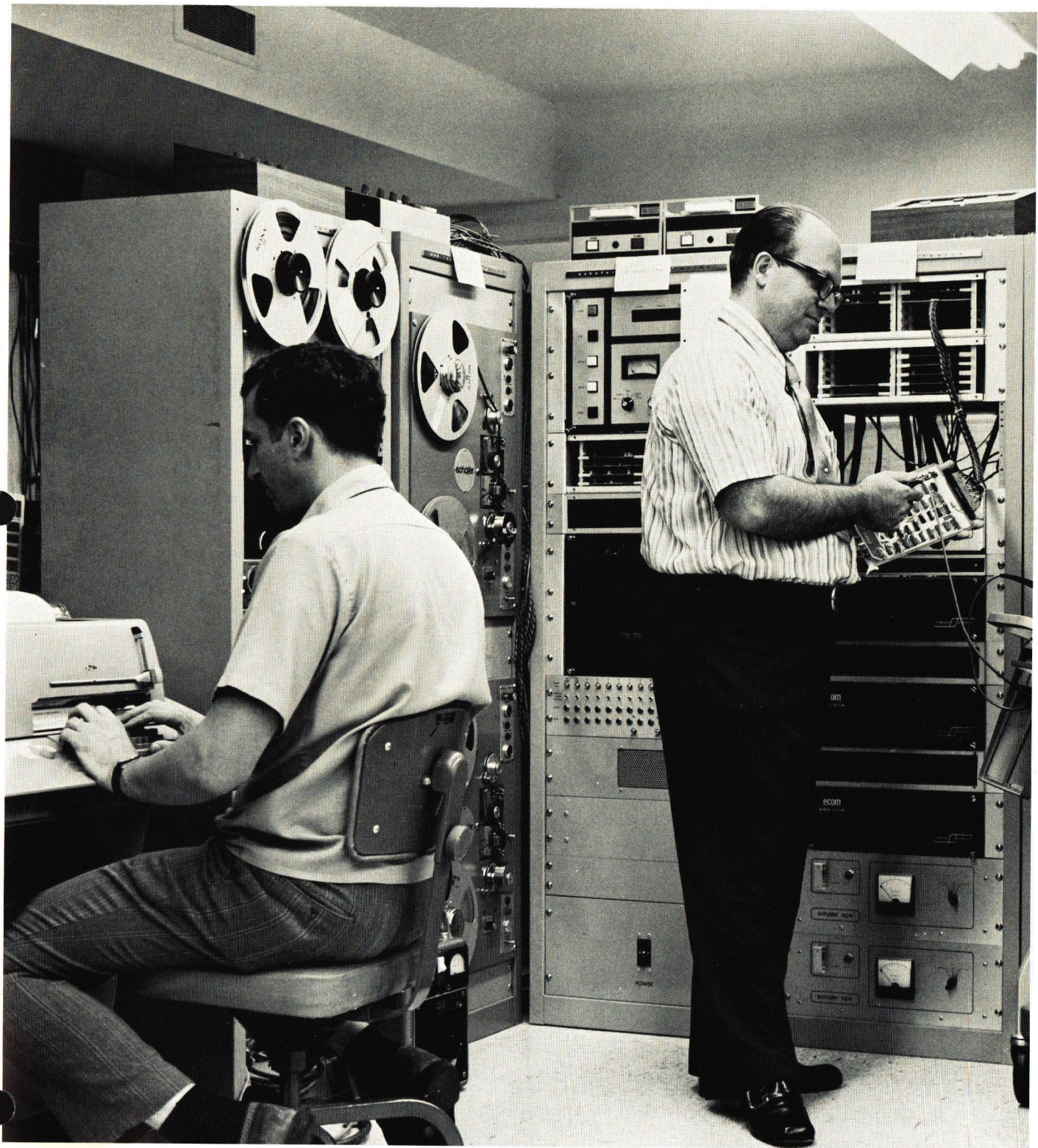
CLEAR Dictionary

Here is the simple list of words and symbols with which to communicate with your Schafer Model 8000. It's as simple as that to go "on the air" with the most sophisticated broadcast automation system in existence.

A	Signifies AM after time has been typed
AC	Symbol for Audio Clock in Format file
AM	When system is operating both an AM and FM station, this signifies that a command pertains to AM operation
CLOK	Log designation for Audio Clock
AUXI	Time file entry for outputting an auxiliary event. Also log designation
AV	Symbol for Available in Format and RAS files
AVAL	Time file command allowing operator to make a time slot available at a specific time
BYE	Operator signoff
CORRECT TIME	Operator command to input current day and time
CR	Carriage return. This key must be used at end of each operator statement
DELETE	Allows operator to delete an item from a format or RAS file
EDIT	Allows user to exercise several options in editing the time file
ENCODE	Prepares the system to encode alphanumeric data on cartridges or reel to reel devices
ENTER	Allows operator to enter an item into a format or RAS file
FM	When system is operating both an AM and FM station, this signifies that a command pertains to FM operation
FORMAT	Gives operator access to specific format file
FRMT	A time command which changes current format to new format and log designation indicating a new format has started
GOTO	Causes the computer to change formats immediately on receiving this command from the I/O typewriter. It also logs the event
HI	Used by operator to start conversation with computer
JN	Symbol for Join Net in Format file
JNET	Log printout indicating network was joined at specific time. Also operator time file command for joining network at specific time
LNET	Log printout that network was left at specific time. Also operator time file command to leave network at specific time
LIST	Allows operator to list items in Format, Time or Spotter file
M1-M12	Symbol for Music Machines in Format file
MU01-MU12	Symbol for Music Machines in log
*NOT AVAILABLE	Computer response if operator asks for invalid format or RAS

OFF	Computer response to operator signoff BYE
ON	Computer response to operator signon HI
P	Signifies PM after Time has been Typed
PANIC	Log designation that next event was activated. Also manual switch on BCC
PF	Symbol for Play Fill in Formal file
PLAY	Log designation that fill tape goes on air
PNTR	Log designation that pointer in format being played has been moved. Also a time file command which sets format to a particular position
POSITION	RAS instruction permitting operator to tell computer to what spot a RAS is cued
RAS	Gives an operator access to a specific RAS file (Random Access Source)
RAS1-RAS8	Time file command to play a particular RAS. Also log designation for RAS
READY	Computer response to a valid operator command. Indicates that action has been taken
*RECOVERY	Log designation of a system recovery after a power failure or dead start
REMOVE	Allows operator to remove an audio device from the system
RE	Format command which causes format to be restarted from its first event
ROLL	Allows operator to start fill tape rolling at specific time using the time file. Also log designation that fill tape was rolled at specific time
S1-S8	Symbol for RAS in Format file
SET	Command which causes a RAS to automatically cue to a particular spot and moves pointer to position in file
*SILENCE	Log designation indicating that silence sense occurred on last event
STATUS	Requests current system status from computer
STRT	Time file command by operator to put station on the air at specific time. Also, log designation for same
STOP	Time file command to take station off the air at specific time. Also log designation for same
TIME	Gives operator access to Time file
*WHAT?	Computer response to invalid operator command
↑	Deletes entire line on Teletype
←	Deletes previous character on line.
*	Prefix for any typed computer response. Also indicates a system element which has been removed in the Format file
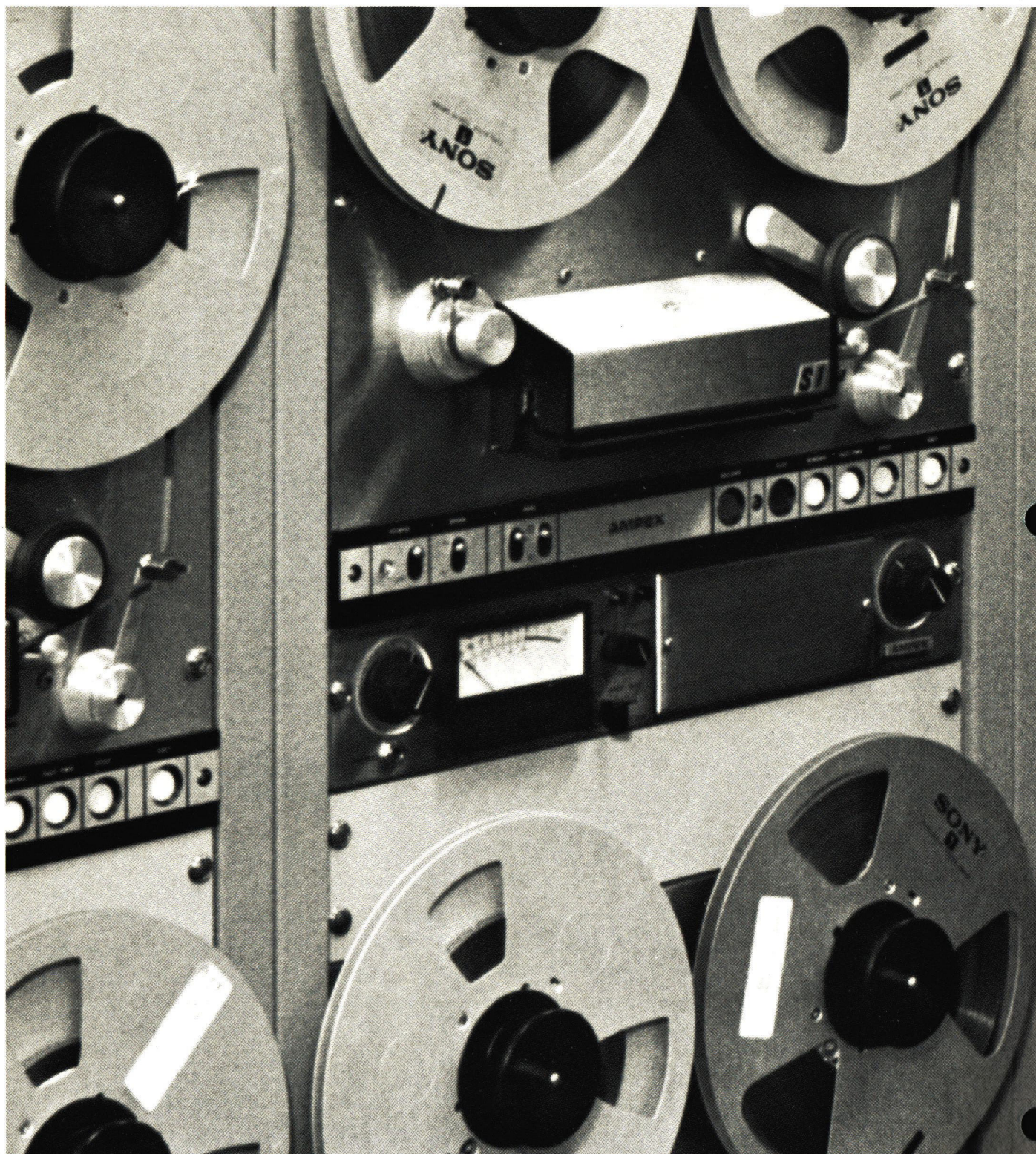
schafer
ELECTRONICS CORPORATION

If you would like more information,
a representative to contact you, or a
demonstration of a Schafer 8000 at
your station in our fully-equipped van,
please write or telephone.