



No.2EAX

Class 4/5 Electronic Automatic Exchange



NO. 2 EAX offers dramatic new capabilities

No. 2 EAX offers Class 4/5 operation, added CENTREX capabilities, and other important new features that make it today's best buy in central office switchgear. It's all part of a continuing plan for new enhancements to this powerful switch. Look at what No. 2 EAX now gives you:

METRO SERVICE In Class 5 Metro applications, new growth capacity allows No. 2 EAX to expand economically up to 50,000 lines, 15,000 trunks, 80,000 directory numbers and 400,000 CCS.

ADDITIONAL CENTRAL OFFICE CENTREX FEATURES For Class 5 and Metro applications, No. 2 EAX offers full CENTREX service, including Most Economical Route Selection (MERS), and Message Detail Recording (MDR).

REMOTE LINE SERVICE By using a remote line unit, No. 2 EAX can serve up to 96 distant subscribers via a 2-pair T-1 line. Enables you to provide service promptly to isolated areas by using existing cable pairs. Also enables you to provide isolated subscribers with custom calling features. Interface is provided by a central office terminal. And you can add as many remote line units as you need.

DIGITAL TRUNK INTERFACE Permits digital trunks to be terminated on the No. 2 EAX network. Reduces number of trunk circuits and equipment frames required. Saves floor space. Reduces administrative and maintenance costs.



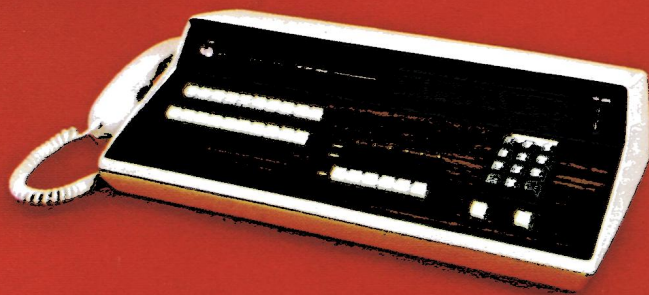
CUSTOM CALLING FEATURES offer new opportunities to build revenue. And to provide high-efficiency services that mean more satisfied customers.

CAMA enables a Class 4/5 No. 2 EAX office to record its own billing data and the billing data generated by tributary offices. Can mean a more rewarding share of toll revenues for the telephone company.

There's a lot more to this outstanding, computer-controlled switching system. Like network engineering flexibility, administrative aids, savings in floor space, economy in power usage, and future adaptability to CCIS. Plus the economy and reliability of automated self-diagnosis.

It all adds up to better telephone service. And profit. Today—and throughout a lifetime of tomorrows.

CENTREX OPERATION ...an outstanding economy



Centrex operation provides a wide range of revenue-producing features. It offers you an outstanding opportunity for profitable new business.

And adding Centrex capabilities to a working No. 2 EAX office is simple and economical. All that is required is a new stored program, plus associated Centrex hardware, which can be mounted on existing frames. No dedicated frames are needed for Centrex equipment.

At the subscriber's premises the only equipment required is the attendant's console, subscriber station equipment, and a small power supply.

Even outside cable costs have been reduced significantly. Only three cable pairs are required from the attendant's console to the central office.

Centrex attendant features

- Attendant Alpha/Numerical Display
 - Called number display
 - Station number display
 - Station class of service display
 - Type of call display
- Automatic call splitting
- Break-in without secrecy
- Call hold
- Call splitting
- Call waiting lamp
- Camp-on with indication
- Conference
- Control of facilities
- Delayed calls
- Dial thru on station calls
- Extension of station calls
- Extension of trunk calls
- Night answer control
- Pushbutton dialing
- Release loop operation
- Trunk group status field

Centrex system features

DID (DIRECT INWARD DIALING)

- Restriction
- Distinctive ringing
- Transfer:
 - Attendant controlled
 - Station controlled:
 - Consultation hold
 - Conference, three-way (add-on)

CUSTOM CALLING FEATURES build business

Custom Calling features add a whole new dimension of efficiency and sophistication to telephone service.

For example, with Call Waiting, an audible signal tells a customer that he has a second call coming in.

Three Way Calling enables him to add a third party to an existing conversation.

Speed Calling allows him to reach pre-determined numbers by dialing only one or two digits.

Call Forwarding permits him to have his calls automatically transferred to another telephone when he's planning to be away from his regular telephone.

Series Completing transfers his calls when his phone is busy or goes unanswered.

Custom Calling features can be provided for any individual line in the office. They save time, help prevent lost calls. Your customers will be glad to pay extra for them.

They can be an important source of new business.

DOD (DIRECT OUTWARD DIALING)

- Restriction
- Billing
 - Published number billing
 - Station number billing
- Transfer
 - Attendant controlled
 - Station controlled
 - Consultation hold
 - Conference, three-way (add-on)

NUMBERING PLAN

- Abbreviated dialing
- Room number correlation

TRUNKS

- Central Office
- Foreign exchange
- Tie
- CCSA

NIGHT ANSWER

- Predetermined
- Universal
- Mixed

CONFERENCE—4, 8 & 12 PARTIES

- Dial up
- Meet me

CPE INTERFACE

- Centralized dictation
- Taped instruction
- Dial access information retrieval
- Automatic answering and recording service
- Computer input
- Inquiry

CALLING AND PAGING

- Code call
- Paging
- Public address

MULTI-CUSTOMER OPERATION

- Up to 32 customer groups

SPECIAL ARRANGEMENT

- Shared service
 - Inter-customer abbreviated dialing
 - Inter-customer transfer facility
 - Shared attendant facilities
- Institutional
- Satellite

CONSOLE-LESS OPERATION

INTERCEPT ARRANGEMENTS

- Attendant
- Recorded message
- Station

MOST ECONOMICAL ROUTE SELECTION (MERS)

MESSAGE DETAIL RECORDING (MDR)

DIRECTED CALL PICKUP

CLIENT BILLING CODE

SOURCE BILLING OF ATTENDANT-HANDLED CALLS

ATTENDANT AUTOMATIC RECALL

- Don't answer
- On hold
- On camp-on

CALL WAITING—TERMINATING

THREE-WAY CALLING ON INTERCOM CALL

CALL FORWARDING

- To attendant
- To a Centrex station
- To station outside of customer group
- Activate—subscriber or attendant
- Deactivate—subscriber or attendant

SPEED CALLING

- Customer group
- Individual station

CALL DIVERSION—BUSY

- To attendant
- To a Centrex station

CALL DIVERSION—DON'T ANSWER

- To attendant
- To a Centrex station

STATION HUNTING

- Standard
- Deluxe

CALL PICKUP & HOLD

SWITCHED DIRECT LINE SERVICE

SECRETARIAL ANSWERING

DIRECTED CALL PICKUP

EXECUTIVE OVERRIDE

Centrex station features

LINES

- Single station—rotary dial or DTMF
- Multi-station—rotary dial and/or DTMF
- Single frequency ringing

RESTRICTION

- DID
- DOD
- Toll
- Multilevel

STORED PROGRAM FLEXIBILITY protects your future

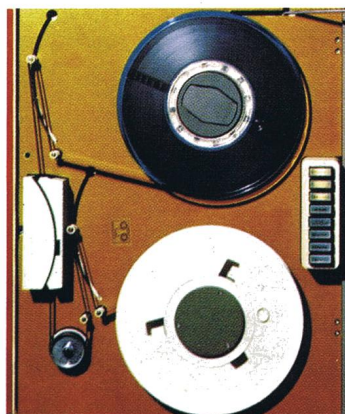
No. 2 EAX features a stored program control that adapts readily to changing requirements.

For example, in many cases, you can provide service features by merely giving fresh instructions to the program, instead of adding hardware or making wiring changes. This makes it easier to provide extra-revenue services.

The instructions can be typed on a teleprinter, which may be located at the No. 2 EAX switching equipment, or located remotely, as desired. When a large number of changes are needed, they can be made by the use of magnetic tape.

Stored program control also simplifies upgrading.

CAMA TICKETING cuts costs, improves service



To add CAMA equipment to serve over 40,000 lines requires adding only one 27-inch rack, eight feet high. Records for 1,000 completed calls can be stored on only nine feet of magnetic tape (a reel holds up to 2400 feet). Electronic circuitry minimizes maintenance. Centralized automatic message accounting relieves burden on toll office ticketing facilities.

CENTRAL OFFICE FEATURES

CUSTOM CALLING SERVICES

- Call Waiting
- Three-way Calling
- Speed Calling
- Call Forwarding
- Series Completing

TOUCH CALLING

Touch Calling may be provided on any subscriber line—in most cases a simple class-of-service mark in the memory is all that is required. Touch Calling does not have to be restricted to a particular group of lines. Both rotary dial and Touch Calling telephones can be mixed on the same line, if desired

DATA TRANSMISSION

- Voiceband-width digital data can be switched with confidence
- Extremely low impulse noise assures fewer errors

OPTIONAL EAS TO SUBSCRIBERS

Individual subscribers may be offered Extended Area Service. Up to eight zones can be provided on a flat-rate, message-rate, or Multi-Metered Unit basis for usage sensitive pricing in each zone

SWITCHED DIRECT (NON-DIAL) SERVICE

Customer lifts handset and is immediately switched to a specific desired station. No digits to dial. An example would be an airport phone on which calls are automatically switched to a taxi service

EXPANDED SWITCHED DIRECT SERVICE

Combines no-dial service with number hunting on a consecutive or non-consecutive basis

SINGLE DIGIT DDD ACCESS

With either "1+" or "0+" service, dialing only one digit gives access to the nationwide network

EMERGENCY CALLING

Prepay coin telephones can be arranged to provide "911" or "dial 0" service without coin deposit

INTERCEPT SERVICE

No need to make changes at the distributing frame to put a line on intercept. Simply type new program instructions on the teleprinter

SEVEN-DIGIT DIALING ON LOCAL AND EAS CALLS

Assures a uniform numbering system

FREE COIN SERVICE

Local calls can be made from coin phones to police, fire department, designated business firms, etc., without coins

FULL INWATS AND OUTWATS SERVICE

- Equipment provides required translation and routing
- WATS subscriber lines can be Touch Calling or rotary dial
- Toll recording system can be used to analyze WATS traffic

CUSTOMER-DIALED DDD RECORDING

Station-to-station calls can be processed by automatic message accounting equipment using the No. 2 EAX data processor, scanners and magnetic tape hardware. Tape record contains trunk number, called number, calling number, starting time and completion time, date, rate and class of call. Alternately, toll traffic can be routed automatically to nearest office having centralized SATT, CAMA, or TSPS facilities

CO-LOCATED LAMA SERVICE

- Can be provided for an existing co-located office to handle station-to-station DDD traffic
- These calls are then routed as pre-ticketed traffic

MRS/MMU SERVICE

CAMA equipment can be used to record all local (No. 2 EAX) message rate service and multi-metered unit calls

BUILT-IN ANI

ANI is involved in the processing of all 1- and 2-party calls. No extra hardware is needed

REMOTE ONI BI-LINK

Can be provided to permit an operator at a remote toll center to obtain calling party's number and enter it in the No. 2 EAX CAMA recording equipment

INTERNATIONAL DDD CAPABILITY

Can recognize the International DDD codes, accept up to 15 digits, and route to the toll center for subsequent processing to Gateway offices as may be required

DIGIT STORAGE

No. 2 EAX can receive and store up to 15 digits of a called number, and can send up to 16 digits to other offices. In addition, seven digits of ANI information can be forwarded to a remote toll center

SENDER CAPABILITY

- Sixteen digits
- Sends DP or MF (2/6)
- Recognizes stop dial, delay dial, wink start
- Provides TSPS information digit forwarding

TOLL RESTRICTION

- Telephones exposed to the public can be restricted from placing toll calls to the DDD network
- Various classes of restriction available on an individual line basis

PABX TRUNKING

- PABX toll restriction eliminates need for trunk group toll restrictors
- Rotary break service can be accommodated
- Provision made for 1,000 two- or three-line rotary hunting groups

FAST SWITCHING

The switching matrices are practically instantaneous in operation. Fast switching cuts holding time of common equipment, helps move more traffic, improves customer service

EXTENDED SUBSCRIBER LOOP CAPABILITY

Pulsing, ring-trip and supervisory capability of the No. 2 EAX permits operation of subscriber loops having a total external resistance of up to 2000 ohms at 50 volts. Fewer long line adapters are required. Transmission limitations depend on the telephone instruments used

DIRECTORY NUMBER VERSATILITY

Subscriber moving within a No. 2 EAX office area can keep his number because any number can be assigned to any cable pair. A simple change in programming is all that is required—there's no need for rewiring at the distributing frame

NON-DIAL LINE SERVICE

Non-dial common battery lines are class-marked in the program. Calls originating on them are routed automatically to an operator

MORE CLASSES OF SERVICE

Class of service marks modify equipment operation to suit the particular type of line or trunk being served. Marks indicate information such as:

- Type of service provided
- Special features available
- Blocking or restrictions
- Toll ticketing information

ALTERNATE ROUTING

- One to six routes permissible for any destination code—one primary route, up to five alternates, including optional routing to busy tone or announcement
- Sending mode adaptable to any alternate route
- Sending flexibility provided by separate sending instruction for each alternate route. Up to seven digits may be prefixed or deleted

AUTOMATIC NUISANCE CALL TRACING

- No peripheral line equipment necessary
- Lines may be class-marked for tracing
- Record of calls printed out at console
- Printout includes called number, calling line or trunk, and time of day
- Audible alarm in office can be activated when subscriber flashes his hookswitch
- Calling path within the office is locked up for verification when alarm is activated

ELECTRONICALLY-STORED PROGRAM

- Easily altered—simplifies upgrading
- Enables you to assign additional services to a customer by simple changes in the software. Changes can be made by tape or teleprinter

COIN TELEPHONES

- Full prepay with operator coin control using in-band, loop control, or third wire control
- Dial tone without coin deposit. Available for "911" or "dial 0" emergency calling
- Can return or retain coins on certain types of calls if desired
- Semi-postpay operation available

TANDEM SWITCHING ON EAS CALLS

- Equipment accepts DP or MF pulses from a trunk group on an incoming call
- Digits can be altered if necessary and sender instructed which digits to add or delete. Digits can be outpulsed in either DP or MF mode

LOCKOUT AND LOAD CONTROL

Individual line lockout is provided in the line circuits for "permanent line" conditions, so as to avoid blocking any section of the network in case of a large quantity of permanents due to cable cuts, etc.

ADVANCED ADMINISTRATION AIDS

- No. 2 EAX data processor monitors traffic conditions in critical areas of the equipment and can provide instant printout of traffic
- Peg counts of all operations accumulated in memory for traffic analysis
- Data indicates changing traffic conditions. Makes it possible to plan for changing requirements. Here are just some of the administrative tools provided in our No. 2 EAX:
 - Service Order Input
 - Equipment Observation
 - Call Processing Events Studies
 - Custom Calling Events
 - Call Routing Metering
 - Load Balance Metering
 - Toll Recording Administration
 - Office Administration
 - Traffic Usage

LOW MAINTENANCE—HIGH RELIABILITY

- All critical electronic circuits such as those controlling the data processors and memory are provided in duplicate
- Self-checking of control circuits with:
 - Automatic transfer of load to other circuits in case of trouble
 - Alarm signals and optional printout of trouble source
- Self-checking of each switching network connection with optional printout in event of connection failure

Optional remote maintenance capability by means of teleprinter Console panel permits quick, easy testing by maintenance personnel of:

- Subscriber lines
- Control and peripheral equipment
- Switching network

Console control teleprinter printout can include:

- Equipment failures
- Locked-out lines
- Traffic data for administrative switch load management
- Memory information. All or part of the memory may be printed out (ie: directory numbers or equipment numbers)
- Line and trunk group busy data
- Trouble analysis information

TIMED DISCONNECT

If calling party fails to hang up after called party has gone on-hook, the system waits for a predetermined interval, then drops the connection

OPERATOR VERIFICATION

Over dedicated verification trunks

PARTY LINES

No. 2 EAX is arranged for single, two-and multi-party line service with ANI for individual and two-party lines

RINGING SCHEMES

- Ringling may be either bridged or divided
- Five ringing frequencies available

NETWORK & SWITCH MANAGEMENT

- Following major functions provided:
 - Common signal equipment control permits adjusting time-out settings for registers, receivers and senders
- Trunk control:
 - Trunk busy
 - Directional, reservation/protective reservation (DRE/PRE)
- Routing control:
 - Selective alternate route cancellation
 - Automatic alternate route cancellation
 - Skip alternate route
 - Code cancellation
- Originating traffic control
- Line and trunk load control
- Overload indicators
- Switch and network management display and control panel
- NOTE: All the above controls can be activated by teleprinter input

TOLL RECORDING

ONI operation from local SATT, TSPS, or cord tollboard, or ONI bi-link to remote operators

TEST CODES

- 100-type balance test
- 101-type test board communications
- 102-type milliwatt test
- 103-type supervisory test
- 105-type transmission test with ATMS responder

LOW COST MAINTENANCE

No. 2 EAX is destined to set new records for maintenance economy in Class 5 and 4/5 offices.

Higher Reliability

No. 2 EAX is engineered to minimize potential sources of trouble. All electronic computer control circuits are duplicated for security. All switched connections in the transmission path are sealed-contact reed-capsules. They're free from contact contamination. Free from trouble.

Automated Troubleshooting

There's no need to spend expensive man-hours routing solid-state equipment. Nothing to lubricate, clean or adjust. The computer tests itself by initiating diagnostics periodically. Both the computer control and the switching equipment can be monitored automatically.

Diagnostic computer programs can greatly assist in locating any problem. A computerized diagnostic system is continuously checking the many sub-systems of the office to detect trouble. When trouble is encountered, key information regarding it is displayed on the maintenance and control

console. A trouble report is also printed out on the maintenance center teleprinter (located remotely, if desired). By checking the printouts and related diagnostic information, the switchman can determine the location of the fault.

Simplified Corrective Procedures

Line circuits, trunk circuits and switching matrices as well as electronic control circuits are all on plug-in printed wiring cards. They can be replaced in seconds. Once a faulty card has been replaced, the switchman can request the diagnostic programs to verify that the trouble has been corrected.

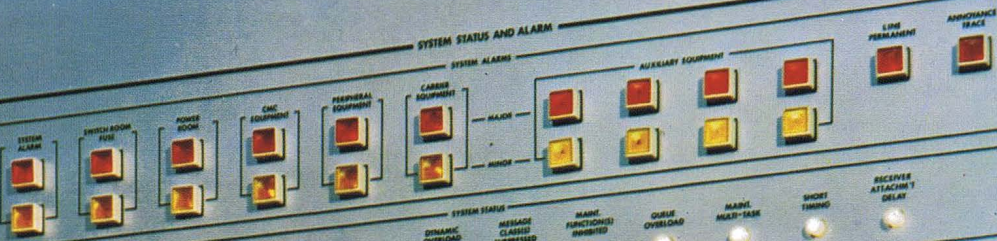
The extensive use of plug-in cards throughout the system drastically reduces the time required to restore a troubled circuit to service. Defective units are simply sent to GTE Automatic Electric for repair.

The No. 2 EAX maintenance concept in a nutshell: Higher reliability... automated troubleshooting... simplified corrective procedures. It assures lower maintenance than you ever thought possible.

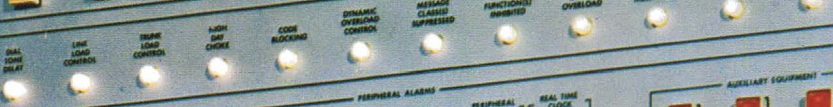
SYSTEM STATUS PANEL gives
visual indication of traffic
load and system operation.

SYSTEM STATUS AND ALARM

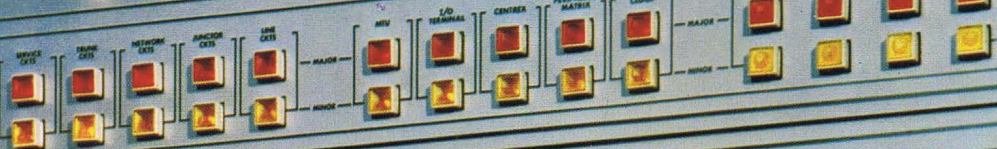
SYSTEM ALARMS



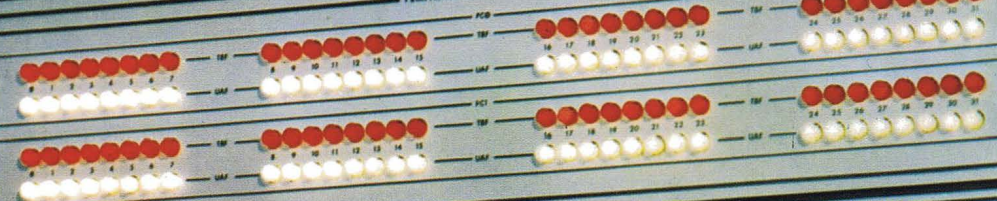
SYSTEM STATUS



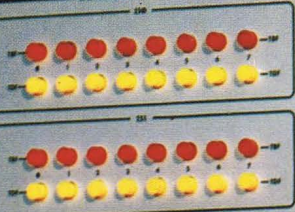
PERIPHERAL ALARMS



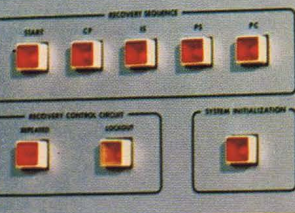
PERIPHERAL CONTROLLER STATUS



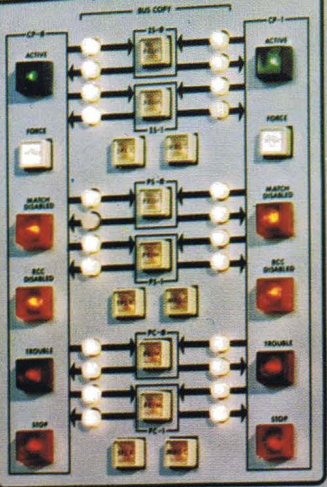
INSTRUCTION STORE STATUS



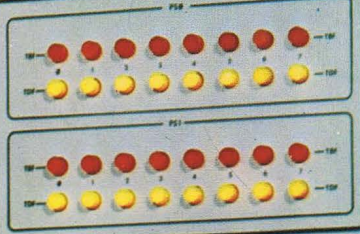
EMERGENCY RECOVERY



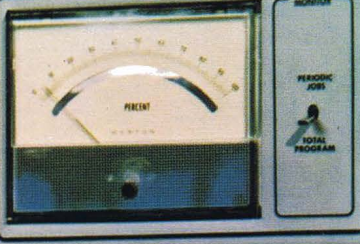
CMC BUS STATUS & CONTROL



PROCESS STORE STATUS



PROGRAM CHECK



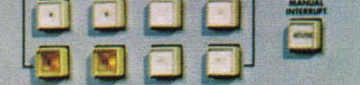
MODIFIED INTERRUPT ADDRESS



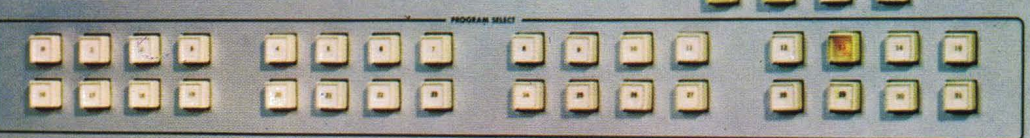
FORCED CMC CONFIGURATION



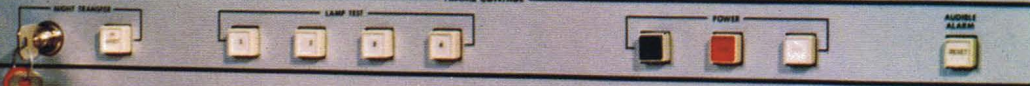
FUNCTION SELECT



MANUAL INTERLUPT

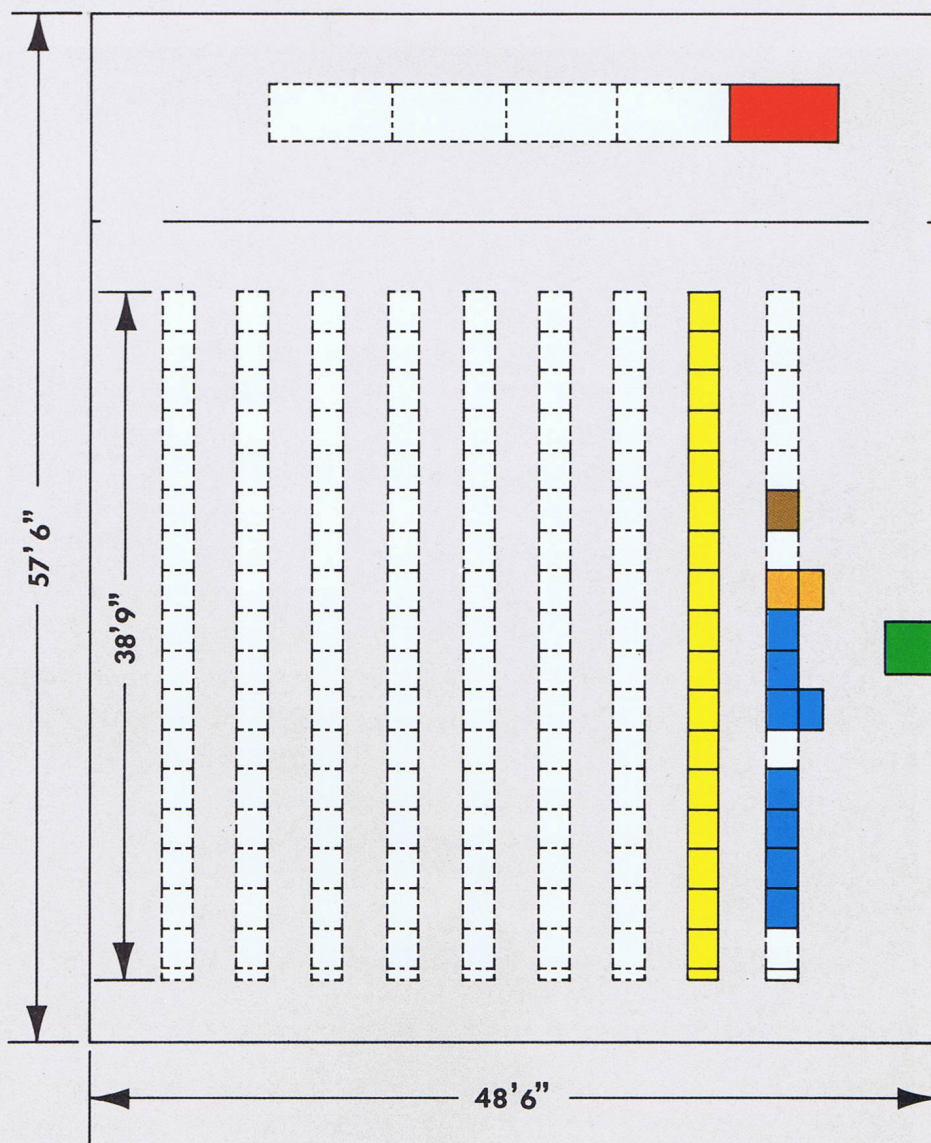
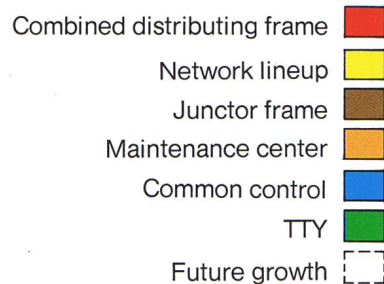


FRAME CONTROL



COMPACT EQUIPMENT CUTS BUILDING COSTS...

pre-wired
frames
simplify
installation



Typical floor plan for a No. 2 EAX office shown equipped for an initial 2,500 lines and 175 trunks, and arranged for expansion to an ultimate of 21,000 lines and 1400 trunks.

Magnetic latching reeds help cut the space required for No. 2 EAX equipment. They are minicomponents that require only 30 to 50% of the space needed for crosspoint components having comparable capabilities.

No. 2 EAX equipment comes on frames only eight feet high, and can be installed in buildings with a 10' 6" clear ceiling. This represents a savings of three feet over most other systems. Effects a substantial economy in new building costs. Switching equipment for a 21,000-line office can

be installed in an area measuring only 48' 6" by 157' 6".

To simplify ordering and inventory, all hardware is fully standardized.

To save installation time, the equipment frames are fully connectorized, factory-wired, and computer-tested. Only minimum cabling is required between equipment frames and the main frame. And all equipment is easy to reach—no rolling ladders are required.

ECONOMICAL EXPANSION with plug-in ease

Office growth does not present a problem for No. 2 EAX as it does for most common control systems.

When your exchange area grows, No. 2 EAX will grow with it. At a low, economical cost. The system is designed to expand by adding standardized, ready-to-go modules. For example, the switching network, line circuits, trunks, junctors and electronic circuitry are all of the plug-in type. Moderate expansion requirements may be met by simply plugging in additional units. More extensive growth can be accommodated by adding pre-wired frames.

No. 2 EAX takes changing traffic requirements in stride. For example, the modular design of the matrices and junctors permits equipping the switching network to meet initial traffic demands only, then adding matrices as traffic increases.

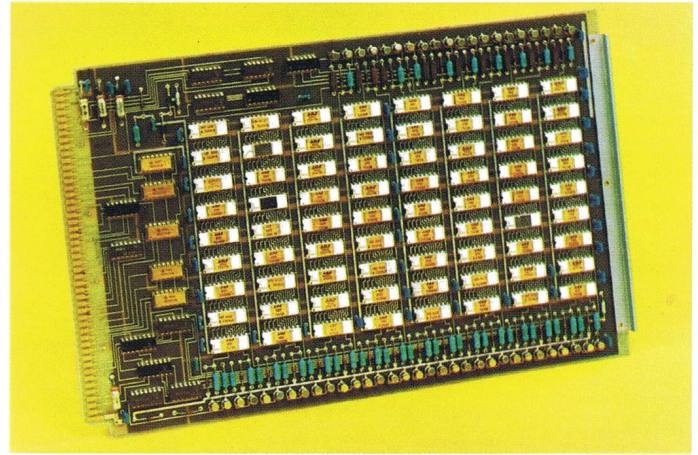
And equipment interconnections may be easily rearranged to rebalance traffic loads. Modular construction, inherent flexibility, and computer-provided traffic data simplify rebalancing.

The economy of No. 2 EAX is especially noteworthy when it comes to expanding service offerings or adding new services. You can expand your Touch Calling offering, for instance, with a minimum of additional hardware and no reassignment of lines. All that is needed is a change of class marks for individual lines. This is done by teleprinter input to the data processing unit. Many new services such as Switched Direct Service, Optional EAS, and "911" Emergency Calling require no additional hardware whatsoever.

ENDURING DEPENDABILITY

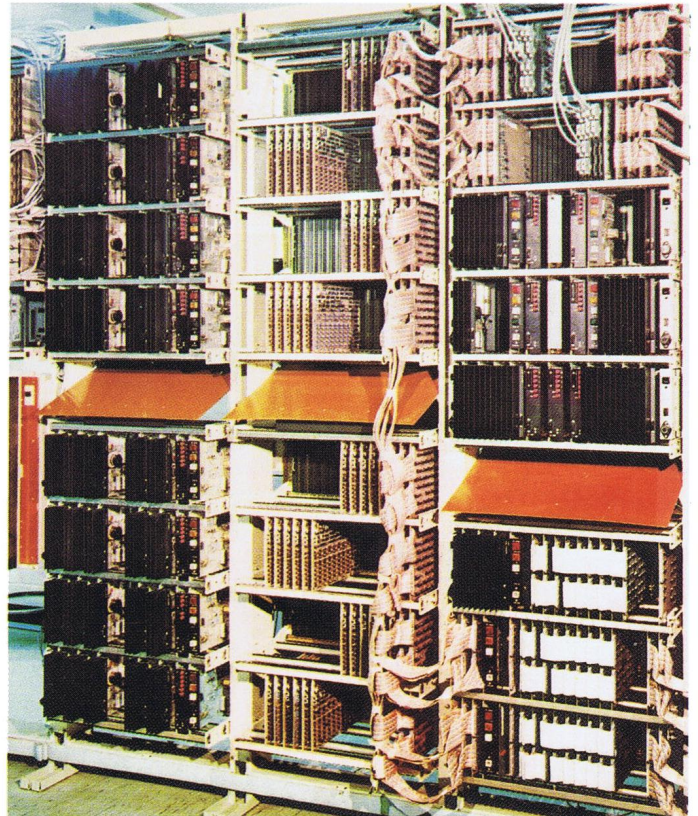
No. 2 EAX is destined to set a new record for dependability in switching systems for the intermediate end office.

The computer, for example, consists of dual memory and dual data processing units. All of them are normally on-line, but one memory and one processing unit control the operation. Should a malfunction occur, the unaffected memory or processing unit takes over—there is no interruption in service.



SOLID STATE MEMORY

Another reason for the outstanding reliability of No. 2 EAX. The solid state integrated circuit memory saves space and cuts costs. Extensive use of integrated circuits throughout the common control reduces maintenance and increases reliability in the most critical part of the system.



2B PROCESSOR

In Class 5 Metro applications the 2B processor extends the capabilities of the No. 2 EAX switching system.

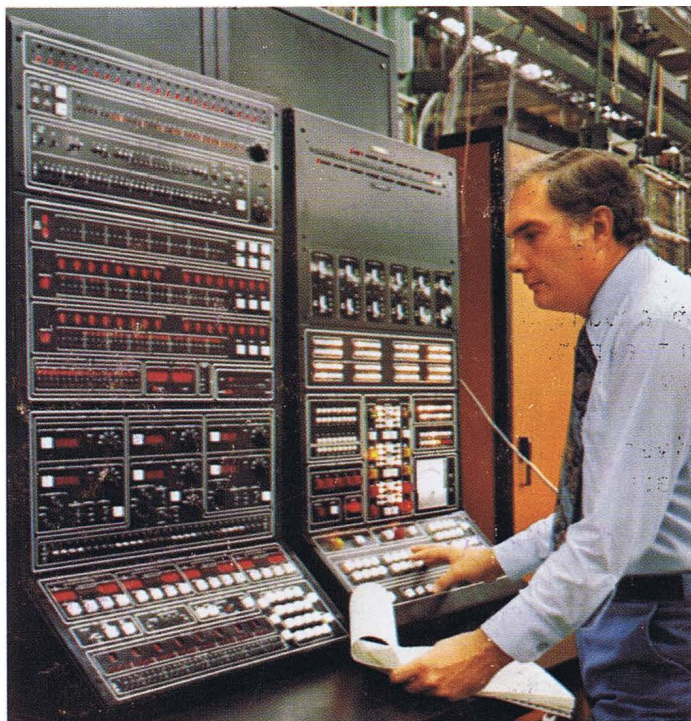
It can execute call processing and non-processor maintenance software at a much faster speed (.8 microseconds) than was formerly possible. It also provides improved reliability, reduced space requirements, and a flexibility that makes it adaptable to many future requirements.

The central processing units used in the 2B processor are microprogrammable. This simplifies changes in the processor's repertoire.



AUTOMATED WIRING AND TESTING STOP TROUBLE BEFORE IT STARTS

THERE'S NO CHANCE FOR HUMAN ERROR in the backplane wiring used on No. 2 EAX equipment frames. It is done completely by machines which are directed by computer control. The accuracy of automated wiring has been proven far superior to that of techniques previously used.



BUT JUST TO MAKE SURE... every No. 2 EAX switching system is functionally tested at the subsystem level before being shipped. A computer applies test programs and checks responses. Should faults be encountered, they are corrected. Testing then continues until the entire subsystem performs as specified.

May we plan ahead with you?

Which central office switching equipment would prove best for your particular area?

How many lines should you buy initially?

How should growth in lines, trunks and ticketing be planned to assure the greatest economy in a long-range program?

Which services can you offer most economically?

Before attempting to answer questions like these it may pay you to obtain expert counsel... an area where we can be most helpful. Since we make a variety of both electronic and electromechanical switchgear, we can assist you in arriving at a truly objective analysis of your requirements.

Ask our representative to arrange a consultation with our staff engineers.

GTE AUTOMATIC ELECTRIC

INNOVATORS IN ELECTRONICS

GTE/AE MARKETING REPRESENTATIVES

Bob Vorac: Los Gatos, CA
(408) 395-3177

customer: Gen. Tel. Co. NW
Hawaiian Tel. Co.

Don Mugrage: Santa Monica, CA
(213) 451-1436

customer: Gen. Tel. Co. CA
Cont. Tel. of CA

Joy Wolfertz: Portland, OR
(503) 292-3105

customer: Roseville Tel. Co.
Ellensburg Tel. Co.
Fairbanks Municipal Util.
Citizen Utilities
other independents

Bob Fitzgerald: Thousand Oaks, CA
(805) 496-7575

customer: GTE Affiliates for CPE
GTD-120/1000/4600

Chet Sagasser: Thousand Oaks, CA

Jim Simpson: Thousand Oaks, CA

Lynn Kentala: Northlake, IL
(312) 681-7950