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## FIELD SERVICE PLANNING INFORMATION PROGRAM

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FIELD SERVICE BRIEF

IBM MAINTENANCE POLICIES

SEPTEMBER 1979

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# FIELD SERVICE PLANNING INFORMATION PROGRAM

**OBJECTIVE:** To provide senior field service managers with basic information and data to support their planning and operational decisions.

**DESCRIPTION:** Clients of this program receive the following services each year:

- Field Service Briefs - Six reports which analyze important new technical and management issues within the field service areas. Reports focus on specific issues that require timely attention by senior management.
- Major Planning Reports - Three reports that will present an in-depth analysis and recommendations of a major technical or management issue that will assist in the formulation of major policy alternatives in the planning of field services.
- Annual Report - This report will summarize major activities in the field services industry during that year in order to determine major trends and their effect on the establishment of future field service planning. Forecasts will be provided of the likely technical and management changes that may occur in order to meet the future requirements of users of these services.
- Annual Presentation - INPUT staff will make an annual in-house presentation to field service executives to summarize the results of the previous year's research and to formulate jointly the strategic guidelines for the research program for the current year. These presentations will occur in the Spring of each year.
- Consulting Support - Individual consultation with INPUT research staff on an as-needed basis through telephone inquiries and visits.

**RESEARCH METHOD:** INPUT carries out extensive research in computers, communications and associated fields:

- Research topics are selected by INPUT based on discussions with client representatives.
- Research for this program includes professional interviews with users, vendors, universities, industry associations, and other analysts.
- Conclusions derived from the research are based on the judgement of INPUT's staff.
- Professional staff supporting this program have 20 or more years of experience in data processing and communications, including senior management positions with major vendors and users.

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FIELD SERVICE BRIEF

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# I INTRODUCTION

# I INTRODUCTION

## A. IBM's COMPETITIVE POSITION

- IBM enjoys the enviable position of having no competitors in the Field Engineering (FE) and service environment.

- From the outset, IBM's philosophy has been to maintain its own equipment primarily through on-site service/repair practices, although some off-site repair center work is performed.

- IBM's high valuation of its customer base dictates that IBM will continue to establish industry standards for the maintenance of computer hardware and software products.

- In a recent study just completed by INPUT, the end users sampled indicated that a manufacturer's maintenance/service policies and degree of support were more important than the price paid for the product.

- IBM's ability to negate competition is accomplished through various means. To begin with, IBM's corporate image attracts highly qualified applicants. These applicants are then provided the opportunity to learn and maintain the largest data processing product line and equipment base in the world.



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- Multi-product opportunities are unlimited for those FE individuals who desire to "attach their scope" to the varied product spectrum.

- Training for FEs is standardized during the initial training phase regardless whether the FE is part of the Data Processing Marketing Group (DPMG) or the General Systems Group (GSG).

- After the initial training process, the FE receives approximately 50% more training through the Field Instruction System (FIS).

  - FIS is a highly interactive terminal-based training system which is used to acquaint the FE with new products, changes to existing products and, further, provides the ability to take refresher courses on all products. The FIS system is an integral part of the training process and its use is expected to grow substantially.

- The typical IBM FE has some college with an emphasis on technical subjects. However, once his training commences at IBM, the technical aspect is played down. Communication skills and logic skills are nurtured in lieu of developing only diagnostic skills. IBM believes that, through the application of communication skills, FE on-site productivity will be significantly improved, resulting in lower Mean-Time-To-Repair (MTTR) costs and greatly reduced "repeat" and "no fault found" service calls.

- Within the past decade, IBM has encouraged (strategically) that selected equipment be returned to geographical service centers for repairs. Normally, such equipment consists of products that are readily mobile and have backup units installed; e.g., CRT terminals, data collection devices, point-of-sale units, and small mass storage devices.

- IBM's field engineering practices stem from a commitment to respond quickly to a customer's service request. Their general policy is to have an FE on-site within two hours of a call and to solve the problem in less than two hours after arrival.


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- In concert with fast response times and two hour repair policy, the field engineering organization is acutely motivated and directly influenced by the IBM data processing marketing organization.

- The marketing organization not only instills in the customers' mind that the "customer is king" but ensures that other functions, such as field engineering within IBM, support this doctrine as well.

- Therefore, should service problems occur, the IBM marketing representative, more times than not, parrots the customers' complaints and influences the FE personnel towards being more responsive in terms of meeting the customers' needs, whether perceived or real.

- IBM's most recent and decidedly aggressive moves throughout the marketplace leads INPUT to conclude that field engineering standards will not be relaxed.

- IBM's future competitive position will be governed by two key issues: service costs, and the ability to maintain a "par excellence" service reputation with its customers.

## B. IMPACT OF IBM's FUTURE PLANS

- IBM's future plans for maintenance are evolutionary. As new products are announced, FE training integrated, and installations eventually occur, complimentary maintenance programs and policies will be implemented.

- The FE field and headquarters support personnel will continue to be divisionalized for the respective DPMG and GSG groups. Divisionalization is necessary to support the variety of products manufactured, the types of markets served, and the depth of FE training required to support the respective product lines.



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- A hierarchy of service facilities is evident. The branch FE facility will continue to be the keystone for the local service operation. The next service level consists of a service center where customers will be encouraged to bring in units for repair. A service center could support up to several sales branch locations depending upon geography involved. It is expected that special maintenance service policies and rates will be established for this type of service.

- Regional facilities are also available for maintenance support in the event the problem cannot be solved on a timely basis by branch FE personnel.

- Conceivably, the service center will be staffed to repair both DPMG and GSG products. Product specialization will continue within the groups, but personnel will be encouraged to migrate between each group.

- Cost control programs and procedures will become the principal driving force for IBM's FE organizations. With labor costs and fringe benefits continuing to rise 12-15% annually, the FE organizations must demonstrate tangible financial results.

- The commitment to reduce costs, increase FE productivity, and yet maintain leadership in setting maintenance standards, will be no easy feat. However, INPUT believes IBM's in place plans and programs will achieve the objective.

- From an accounting viewpoint, the FE organizations function as cost centers. Within the next decade this might change and FE could become a profit center. For this analysis, however, we conclude the FE support stays as a cost center. However, INPUT estimates that actual profit contribution of FE activities will continue in the range of 20-30 percent of total corporate profits for at least the next five years.

- Internal training necessitated by new products and new methods will see an acceleration of the Field Instruction System (FIS) teaching methods. Savings will result from fewer instructors, reduced travel and lodging for regional FE



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classes, lower capital assets required, and reduced current instruction documentation which can be remotely computer generated with real time updates.

- IBM, concurrently, has a mixed bag of installed products spanning old EAM equipment to the new 303X CPUs and 8100 DDP systems. As evidenced by IBM's most recent maintenance price increases, maintenance costs for older products were raised while the newer products were left untouched.

- Maintenance policies and practices for the older products will continue to prevail. EAM equipment, 360 and 370s and their associated peripherals will continue to be serviced on-site.

- The newer product offerings, however, provide IBM and the user with more flexible service alternatives. In many cases, their small size make possible regular repair at a service center. In other cases, IBM will be supplying a combination of remote on-line diagnostics coupled with the ability of the customer to initiate first level diagnostics on his own to diagnose problems before the FE is dispatched.

- IBM's announced install kits for the 8100 are only forerunners of new techniques for making it easier for the customer to do some of the functions previously performed by FEs. To the end user, this results in total system cost savings.

- Although IBM will provide the user with some capability for diagnostics and drop-in center service, it is not anticipated that IBM will allow customers to do their own maintenance on leased units. As long as IBM is responsible for the equipment, they will perform all maintenance.

- IBM appears to be integrating additional hardware circuits into their new product offerings. For example, the 3274 and 3276 controllers have extra or parallel circuitry. This hardware redundancy could be used to bypass a failed circuit in case failures occur. IBM could also perform a "space age command"


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via the remote service centers - activating backup modules, or loading new microcode for temporary operation (possibly in a degraded mode) until an FE arrives.

- Computer systems cost and performance is rapidly approaching the price and demand curve where a strong product demand may shortly emanate from the personal or consumer market sector. IBM is watching this market closely. Should such a market develop, IBM has the capability to drive the market demand. While this is really a product/market issue, from a maintenance standpoint IBM already has the service center organization in place to service this market segment.

- The balance of this report is based on interviews and analysis concerning the data processing marketing group and the field engineering division in particular. It does not attempt to cover the FE policies or trends for the general systems group, although IBM's attitude towards service and future trends are similar for both organizations.


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# II CURRENT MAINTENANCE DELIVERY MODES

## II CURRENT MAINTENANCE DELIVERY MODES

### A. CURRENT DELIVERY MODES FOR HARDWARE AND SOFTWARE

- Hardware and software are both basically maintained with IBM personnel dispatched to handle a particular problem.

- Customer initiated service, i.e., the call to the IBM dispatcher, is fundamental to IBM service.

- Additionally, preventive maintenance (PM) is performed on most equipment on a regular schedule. This includes running diagnostics on major equipment.

- On-site FEs are provided by IBM, at their discretion, based on required workload. IBM says that it will not contract for on-site FE coverage.

- User participation in hardware maintenance is limited to problem determination. IBM does not allow customers to repair hardware.

- On the other hand, software maintenance is a customer responsibility with IBM taking a lead role in problem determination. If IBM software requires a "fix," it will be provided by IBM but is usually applied by the customer.

- IBM is designating a growing number of devices as Customer Set-Up Units or CSUs. Customer personnel are expected to perform the initial installation of


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this equipment, only calling IBM if the machine or system does not operate as expected. Customers also initiate problem determination before calling IBM for service.

- IBM is dedicated to providing only a single class of service for all customers, no matter what size or location in the U.S. Concentration of equipment in an area may improve service simply because of "economies of scale." But, there is not any class of degraded service for small or remote customers.

- Customers in remote locations will be charged more for service due to increased travel requirements, and they must expect longer response times, sometimes up to 24 hours.

- Hardware and software maintenance is performed by separate personnel in each service location. There is little cross-training, and INPUT was not able to learn of any plan to merge the two functions in the near future.

- Each IBM branch and region has support specialists for hardware and software. These act as backup to the personnel in the field.

- This separation is workable today for most devices, but can cause grief for IBM and customers alike in complex situations such as that found in a communications environment. While the 3705 has an excellent MTBF record, the time to repair has occasionally been measured in days, requiring cross-trained experts from Raleigh to determine and fix problems.

- The Field Engineering Division (FED) of DPMG is divided into 14 regions with each region having 10 to 13 branches.

- The regional and branch FE organizations do not report to marketing, but are separate line functions reporting to FED. However, at each level, FE is acknowledged to be a service organization to support marketing, and marketing takes the leadership role.


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- IBM service is based on a rigid escalation pattern. If a problem cannot be determined in a specified time, usually two hours, the branch specialists are called in. Two hours later, regional specialists are called in.

- Beyond this, the weight of the IBM corporation is felt as whatever resources are required are invoked. A "site-down" situation will receive whatever support is necessary usually as a direct function of customer "clout".

- System support centers within the IBM product divisions, such as the communications center in Raleigh, N.C., are used in problem determination by all levels, including the customer. In fact, the system support center may actually place the call to the customers' FE dispatcher after attempting to determine the problem with the customer.

- IBM FEs are generally assigned to a grouping of customers so that they become familiar with and feel responsibility for the installations. In addition, customers become familiar with "their" FEs and usually develop a high degree of personal rapport with them which tends to reduce friction.

- Dispatch of FEs is handled by local organizations. At least for now, IBM does not intend to go to a centralized dispatch service (assigning tasks to the first available FEs). They do not want to have the depersonalized service of, say, AT&T.

- While most IBM equipment is repaired on-site, some products are repaired at central repair facilities, either at a branch or district facility, or even within a large customer site. The types of devices repaired at central sites are those usually found in public areas such as banks or department stores. Point-of-sale terminals are not repaired where the public can see IBM parts scattered over a counter. The expert in the white coat is fine for CDC or NASA, but not for IBM.

- IBM emphasis has been, and will continue to be, on "business" and not on "machines" in the public eye.



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- While IBM has begun to separate charges for maintaining software from the charges for using that software, there is no indication yet that IBM will separate hardware maintenance rates from lease or rental rates. Facing rising labor costs, the temptation will remain for IBM to separate the hardware lease and maintenance charges so that maintenance can be raised separately along with the cost of living and cost of doing business.

- IBM currently has an FE organization in the U.S. of approximately 18,000 people.

## B. FUTURE DELIVERY MODES FOR HARDWARE AND SOFTWARE

### 1. HARDWARE MAINTENANCE TRENDS

- Hardware maintenance is becoming increasingly costly for IBM and for its customers. As more systems and more customer sites go "on-line", the need to minimize or eliminate down time becomes essential.

- The requirement for the future will be for products which do not fail as often, that can be quickly diagnosed when they do fail, and will be easily repaired or replaced.

- Increased reliability expressed either in MTBF hours or in chronological time between service calls, is being achieved through use of redundant circuitry, through fail-soft techniques such as ECC memory, and through use of more electronics as opposed to mechanical devices, and reduction of components per device.

- With most new hardware devices being built around microprocessors, some form of built-in diagnostics is becoming common.


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- On some devices, such as terminals it is the customer himself who initiates the use of the diagnostics. Since a very high percentage of service calls on these devices results in "no trouble found", with the actual problem usually being operator related, not hardware related, it is faster for the customer and more cost effective for IBM to ask the customer whether or not the device is actually failing before the call is placed to IBM.

- Internal diagnostics now often go beyond just customer oriented problem determination aids. For major devices in the computer room, in-line diagnostics, built into the device, permits troubleshooting by an FE on that device without interrupting operation of any other device on the system. Coupled with the capability of CPUs and control units to run diagnostics while normal operations are proceeding in a multi-tasking mode, overall system availability is greatly improved.

- With the improved diagnostics capability for every device from the CPU to the terminal, hardware problem determination has been greatly improved through isolation. In most cases, the failing PCB or even the failing component is indicated to the FE by the diagnostic routine.

- Device repair has, therefore, become primarily "board swapping."

- While old-timers are not enthusiastic about FE organizations with personnel trained just as board swappers, it is very effective when coupled with enhanced diagnostics. The customer gets his hardware back faster, and the FE organization is able to better control its costs.

- The profile of the IBM FE is also changing. Historically, FEs have been thought of by marketing and customer personnel as mechanics who traded in white socks for white shirts. That image is changing very rapidly.

- FEs are being selected today as much for their communications skills and basic logic capability, as for their technical ability or technical education. As customers move to on-line systems, which cannot go "down" just to fix a single


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device, it becomes increasingly important for the FE to be able to work with the customer in isolating and repairing the problem without disturbing the rest of the system.

- As customers move towards distributed data processing (DDP), and towards the office of the future, with the CPUs interconnected by a data communications link, and with each CPU in the system having a variety of terminals attached, it is becoming increasingly complex just to determine where a problem exists in a system. The FE who can consistently do this has become more valuable than the person who actually applies the fix to the hardware.

## 2. SOFTWARE MAINTENANCE TRENDS

- Maintenance of software requires FEs with different skills and a different type of organization than hardware maintenance. Software support specialists are located in each branch. However, they are organized more according to the kind of software they support. MVS and DOS are not supported by the same people. Software FEs also have account responsibility, but their territories do not necessarily coincide with those of the hardware FEs.

- It is at the branch level, therefore, that hardware and software problem resolution come together. But the nature of software requires a different type of support.

- Where hardware will operate with a regular or predictable meantime between failure, with that time decreasing as components wear out, software usually takes a while to become stable, but then can operate for many years without further "bugs" being detected.

- Also, the very nature of software implies more variability in how it is used than hardware. It is not possible to train software FEs in every detail of what the software does or in every way the software might fail. Rather, the software FE needs the ability to logically follow a procedure, often through hundreds of steps, until an instruction is found that is doing the wrong thing.


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- IBM operating systems are composed of thousands, even millions, of instructions. Keeping track of all the modules and functions is a feat in itself. As a result, IBM is moving quickly to the use of software support centers where the most knowledgeable people about each operating system can be concentrated.

- Branch software FEs and customers can contact these software support centers directly for assistance. In an attempt to contain its own costs, IBM is moving toward limiting the number of software FEs in each branch. By making the software support center available at no charge to the user of IBM program products, and at the same time charging a fee for on-site software maintenance as required, IBM is encouraging users to become more self-sufficient and independent of IBM.

- This is particularly true for the medium-sized users, those using DOS/VSE. IBM is going as far as eliminating the need for a systems programmer to do a system generation with each new release of the software. The software required will come with the system, and the operator or user will be able to follow a cookbook approach in bringing the system up to full operation.

  - In theory, from that point on, no on-site assistance will be needed. Presumably, the user will contact the software support center if he has any difficulties. As with terminal products, many of the problems that have caused an FE to be dispatched to the customer site in the past can now be handled via the support center.

- Again, in IBM's attempt to contain its costs, the customer benefits from getting systems that are easier to use and by getting direct access to the most knowledgeable people available on any given software product.

3. FUTURES

- The future of field engineering will be quite different from what it has been in the past. Personnel are becoming generalists, as opposed to specialists, on particular pieces of equipment.


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- FEs will interact more frequently with users who have no knowledge of, or interest in, how equipment operates or why. Dealing with non-DP professionals in time-critical situations will demand new skills for FEs.

- Hardware increasingly will have the ability to determine its own problems, via internal diagnostics, and to be simply and quickly repaired.

- Small devices such as terminals will not be repaired at the user's site, or at least at the customer site. Rather, they will be brought to central facilities for repair. It can be expected that sending the device to the repair facility, as well as picking it up after repair, will be a customer responsibility.

- Software maintenance will increasingly be done at centralized software support centers, eliminating the need for large staffs of software specialists in each branch and backup personnel in each region. Cost control, consistent with quality service, will continue to be the keystone of IBM's field engineering policies.

- As user systems become more complex, it will no longer be possible to maintain a separation between hardware and software FEs. Determining whether the problem is hardware or software related or both will require a knowledge of both. It will be too costly to send a second FE to a site, particularly for low cost and broadly distributed systems.

## C. ROLE OF SYSTEM SUPPORT CENTERS AND REMOTE DIAGNOSTICS

- As has been noted above, system support centers are already in use for terminals and for software. For terminals, it is already possible to exercise or run diagnostics against terminals from the central support center.

- While the concept of the support center is not new to IBM (it tried to make it a standard way of operating in the early 1970s with the 370/155), these centers


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are only now coming into large-scale use. The 4300 and 8100 systems will both make wide use of system support centers.

- For the 4300 and 8100, remote diagnostics have been planned from the onset of the program. As these units are dispersed throughout an organization as part of distributed processing networks, it is not cost effective for IBM to have FEs running from one site to another. Therefore, the user will be expected to call the support center. If a hardware problem is determined to be the cause of failure, the support center will dispatch the FE. If software is determined to be the problem, the "fix" can be sent from the support center directly to the computer system. The customer would not have to handle the fix physically.

- It is expected that all new IBM systems and terminals will be supported by remote support centers for both hardware and software diagnosis and/or fixes.

## D. CHANGES IN SPARES AND STOCKING POLICIES

- New technology will play a major role in determining IBM's policies for spares and stocking practices.

- IBM's new product announcements appear to have a commonality in the utilization of LSI circuits throughout a product family.

- For example, IBM's extensive use of LSI in their new display terminals (3278, 5251, and 8775) provides IBM with several key benefits:

  - Economies of standardization.

  - Low service costs.

  - Reduced manufacturing costs.


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- Improved inventory control.

- Standardized design and flexibility.

- Value added in other products.

- IBM's circuit technology is not necessarily advanced state-of-the-art, although their ability to manufacture it in volume is. However, their current technology provides an over-abundance of LSI components performing redundant operations, thus greatly enhancing a system's inherent reliability.

- The commonality of packaging LSI components is not restricted only to the myriad of IBM CRTs, but the same components appear to be used within IBM's 8100 series.

- For both series, chips are packaged in 2.5 cm square ceramic carriers. There are up to four chips per carrier and 26 chip carriers per PCB.

- It is believed that the 2.5 cm chip carriers are interchangeable not only between the new CRTs but with selected 8100 circuits as well.

- IBM will continue to dedicate sizeable resources to maintain a position of service leadership. Therefore, reducing mean-time-between-failures (MTBF), and mean-time-to-repair (MTTR) periods, will be realized through the following actions:

  - Reduction in service calls through increased circuit reliability. The implementation of additional LSI circuit redundancy will help IBM achieve improved MTBF standards.

  - The average service call cost approximately $200 in 1979. It is estimated that a 370 CPU and associated peripheral control units each experience one service call every three to six months.



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- Increased hardware redundancy can be designed and implemented into major electronic control components (non-electromechanical) to reduce service calls to no more than one to two per year.

- The control of spares costs can sometimes make the difference between profit and loss (or expense control ratios) for a field engineering organization.

- IBM's standardized packaging of PCBs for the 327X and the 8100, not only allows IBM reduced spares costs, but the costs of stocking are significantly reduced.

- IBM will place increasing emphasis on standardized LSI components. This has not been readily apparent because IBM's newly announced products are only now finding their way to the market.

- It may become feasible for IBM to use standardized PCBs designed around on-board microcode. The microcode required for a board to perform a specific function could be applied by inserting a single IC in a socket, or by loading the microcode with a portable "programmer" containing a "library" of all codes for a system.

- As these products are delivered, their technologies analyzed, and the commonality of circuit designs better understood, INPUT believes that most competitors will have underestimated the degree of component standardization successfully achieved by IBM.

- Another opportunity to control stocking costs, reduce inventories, and achieve better utilization of FE manpower resources would be the implementation of a mobile repair truck. IBM has experimented with this concept in the past.

  - Now, through a combination of new products, parts commonality, and service center utilization, IBM could economically dispatch repair trucks to customer locations for preventive maintenance (PM), as well


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as on-call service requests as indicated in Exhibit II-1 - Example of Hierarchy of Service.

- Selective product type service would result. Units which fall into spares commonality, and some degree of remote diagnostic problem isolation from the service centers, would be categorized for mobile repair service candidates.


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EXHIBIT II-1

EXAMPLE OF HIERARCHY OF SERVICE
(CALIFORNIA)

* SALES/SERVICE BRANCHES

● SERVICE CENTERS

★ REGION



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# III CHANGES IN MAINTENANCE PRICING POLICIES

## III CHANGES IN MAINTENANCE PRICING POLICIES

### A. CHANGES IN PRICING OF SOFTWARE AND HARDWARE - UNBUNDLING

- No changes are expected in the near future in how IBM prices hardware maintenance. Separately pricing maintenance for lease customers would in effect give the customer the option of not having maintenance on the unit. Or it might imply that another maintenance source could be used.

- Because IBM is anxious to protect the integrity of its own lease base, it is not likely that IBM will separate maintenance and lease pricing. Rather, IBM will continue the practice of lowering purchase prices over a period of time, encouraging customers to buy older equipment or to upgrade it to new models.

- In this way, IBM minimizes its exposure to rising labor costs by minimizing the number of rental or lease units from older generations of equipment.

- IBM has already changed its software pricing policy. Software maintenance is no longer bundled with software usage charges for IBM program products. Also, IBM has added software maintenance charges for products that previously had unlimited software support.

- A fundamental IBM strategy is to get as much revenue out of software products as possible by having as many users as possible. Unbundling the


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maintenance price for software gives the user the choice of paying for IBM on-site software support or not. If he does not use it he will be dependent on the software support center or on his own people. The key is that it is the user's choice.

- In either case IBM wins. For the user who does not elect to pay for maintenance, it is not necessary to maintain additional branch software specialists. For the user who does elect to pay for software maintenance, IBM is able to recover its costs and to escalate the maintenance charges if inflation drives up the cost of software support personnel. This is a superb strategy for IBM.

## B. CHANGES IN CONTRACT TERMS AND CONDITIONS

- (In the near future), it is not expected that IBM will change the established contract terms for hardware maintenance or the new software maintenance contract. These will be kept separate.

- As more of the costs of a system shifts from hardware to software, it can be anticipated that IBM may go back to a single maintenance charge for the entire system.

- This would be appropriate if software systems such as DOS/VSE became specialized or so customized that they only ran on a particular CPU. Then the CPU maintenance and the software maintenance charge could be bundled.

- Major changes in contract terms can be expected when the following can be brought together:

  - Effectiveness of remote support centers.

  - Greatly improved reliability of hardware and software.


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- Major changes in ease of swapping spares.

- Customer involvement becomes optional in actual repair.

- INPUT believes this cannot be expected until at least the new generation of equipment proves itself in the field.

- In any case, whatever changes IBM makes will be in its own best interests. Changes will be aimed at maximizing revenue and minimizing costs.

## C. USE OF GUARANTEES, WARRANTIES, ETC.

- IBM does not provide warranties or guarantees on its products. They will state that it will perform according to specifications, or they will make it do so. But they will not claim in advance how long it will take to make it do so.

- For government installations, IBM will specify a certain percentage of total up time per month. They do not break it down any finer than by month. The quoted figures are normally well within known performance levels for all equipment.

- To the best of INPUT's knowledge, IBM has never nor ever intends to warrant software.


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# IV EXPECTED USER ROLE IN FUTURE IBM MAINTENANCE POLICIES

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### A. USER PARTICIPATION IN INSTALLATION AND MAINTENANCE OF HARDWARE AND SOFTWARE

- IBM has already designated most general terminals and small to medium-size systems as customer set-up units. This applies generally to units that are not expected to go into the normal computer room environment.

- Even for a system, such as the 8100, which may be comprised of several pieces of hardware, the customer will be expected to uncrate all the units, put them into place, cable them together, and bring them up under the provided software.

- If the customer wishes to have IBM field engineering personnel perform these tasks, it will be done for a fee.

- Documentation to guide the user through this activity is surprisingly thorough and easy to follow. It could conceivably be done by a clerical level person. However, a building maintenance type person would often be employed and would have no trouble following the instructions.

- Maintenance procedures are similar to installation procedures. The user will be involved in determining that a problem actually exists and what the problem is. Following simple instruction guides, the user can check out whether all the


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switches are set properly on the machine and even execute the basic on-board diagnostics.

- Assistance can be had by calling the support centers that are open 24 hours a day, seven days a week. The hardware support centers can run diagnostics and if necessary dispatch an FE.

- The software support centers can request listings of the software actually being used, can request memory dumps, can analyze problems, and can return fixes directly to the system.

- The user participates by initiating the procedure. But the user is not expected to physically change the machine beyond setting switches, checking cables, or entering data through a keyboard.

- Documentation for software is being shifted from voluminous stacks of system generation listings to on-line storage. Most users of small to medium systems have no need for total systems generation listings. When required they can be displayed or dumped by a field engineering software specialist, or more appropriately by the remote software support center.

- Documentation on how to use the software will be contained within the system itself on disk storage and will be displayed to the operator on the system CRT console.

- When problems are encountered, the operator merely has to indicate that help is needed. The new software will lead the customer through a training exercise or through problem diagnostics, whichever is required.


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## B. ATTITUDES TOWARD SMALL AND LARGE USERS

- Because IBM is dedicated to one class service for all customers, they attempt to maintain the same attitude toward both large and small users. But as IBM systems become more dispersed throughout organizations; that is, as they get further from the central computer room, IBM will do everything it can to keep from sending a field engineer to perform service.

- For the central computer room, IBM does not guarantee on-site FEs. Large sites obtain this service if the total work load at that site warrants it in IBM's estimation.

- There may be, in fact, a different in-service level for large customers relative to small customers, but that is simply because of economies of scale.

- System H can be expected to introduce many of the concepts now being used on small systems for large users. This means there will be more centralized software support and less requirement for on-site software FEs.

- Also, there will be increasing use of centralized diagnostic capabilities. By the time an FE gets to a site to repair a large system, he can anticipate having the diagnostics already run and the PCBs to be replaced indicated at the site or relayed to him directly through the dispatcher.

- For new, large systems, it is possible that boards will be used for multiple functions. Read-only-memory ICs may be inserted into generalized boards to make them special purpose boards.

- While this could be done by customers, it is not expected that IBM will want the customer to actually change the hardware on present generation equipment.


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- One area in which different size customers get different treatment is in the location of spares. Spares are seldom stocked at small customers' sites but often are at large customers. The result is faster time to repair for the larger customers.

- Use of common PCBs with loadable ICs will help get the necessary spares to the smaller user faster. FEs could carry a supply of basic PCBs and an IC, or microcode library.

- For larger cities, IBM may follow the lead of some of its competitors and stock spares in a roving warehouse or van with basic spare kits that go to a requesting FE.


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# V IBM'S COMPETITIVE STRATEGIES

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### A. OTHER HARDWARE VENDORS

- IBM's attitude towards service competition can best be described as passsive opposition except for obsolete equipment where client control is no longer important. In those cases, IBM provides no resistance to maintenance by third party maintenance companies.

  - For third party maintenance (TPM) companies, who wish to maintain IBM equipment, IBM will train the third party companies' field engineering staff.

  - IBM provides training materials, instructor time, classroom machines, etc., all on a direct chargeable basis.

  - IBM further provides standard documentation. This documentation does not include any shortcut diagnosis or repair techniques IBM has developed for its own use.

- In a multi-vendor environment at a customer site, IBM's attitude is that they like "fingertip touching" not "fingers interlocking" relationships. They will cooperate, for example, to the point of running diagnostics for their peripherals on a PCM vendor's CPU. But as long as there is doubt as to which piece of equipment, or which vendor's equipment is actually causing a problem,


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IBM assumes a "show me" posture. This attitude has resulted in several TPM contract awards.

- For communications related diagnostics, IBM must cooperate with communications carriers and other communications equipment suppliers. As IBM encounters more competition from AT&T, they can be expected to show less cooperation in working with people from the one company they consider to be their major competitor.

- Otherwise, IBM shows no difference in working with vendors of any size. A small vendor with only one terminal in the shop gets the same fingertip treatment as Univac or Burroughs with a CPU sitting alongside IBM CPUs.

- IBM does not go out of its way to stock spares for competing third party maintenance companies. The third parties must be prepared to stock its own back-up supply in case of large demand. For large orders of spares, third parties have to order from the manufacturing facility of the appropriate IBM Division.


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- Planning Service for Computer & Communications Users - Provides managers of large computer/communications facilities with timely and accurate information on developments which affect today's decisions and plans for the future.

- Small Establishments Service - Analyzes and forecasts small establishments' (<500 employees) use of office, communication, and computer services and products. Applications requirements and economics are emphasized.

- Computer Services Market Analysis Service - Provides market forecasts and business information to software and processing services companies to support planning and product decisions.

- Computer Services Company Analysis and Monitoring Program - Provides immediate access to detailed information on over 2,000 companies offering software and processing services in the U.S. and Europe.

- Field Service Planning Information Program - Provides senior field service managers with basic information and data to support their planning and operational decisions.

**MULTICLIENT STUDIES:** Research shared by a group of sponsors on topics for which there is a need for in-depth "one-time" information. A multiclient study typically has a budget of over $100,000, yet the cost to an individual client is usually less than $10,000. Recent studies specified by clients include:

- Maintenance Requirements For The Information Processing Industry

- Value Added Network Services

- IBM Series/1 Analysis

**CUSTOM STUDIES:** Custom studies are proprietary to a client. Fees typically range from $10,000 to over $50,000 and are a function of the extent of the research work. Examples of recent assignments include:

- Survey Fortune 500/50 companies to determine plans for distributed data processing.

- Compare the internal charges for EDP services in a large company to those of commercially available services.

- Determine the market potential for an associative Relational Data Base Management System Processor.

- Conduct the 1979 ADAPSO Survey of the Computer Services Industry.

- Analyze the opportunities and problems associated with packaging terminals and/or minicomputers with remote computing services.

## ABOUT INPUT

### THE COMPANY

INPUT provides planning information, analysis, and recommendations to managers and executives in the information processing industries. Through market research, technology forecasting, and competitive analysis, INPUT supports client management in making informed decisions. Continuing services are provided to users and vendors of computers, communications, and office products and services.

The company carries out continuous and in-depth research. Working closely with clients on important issues, INPUT's staff members analyze and interpret the research data, then develop recommendations and innovative ideas to meet clients' needs. Clients receive reports, presentations, access to data on which analyses are based, and continuous consulting.

Many of INPUT's professional staff members have nearly 20 years experience in their areas of specialization. Most have held senior management positions in operations, marketing, or planning. This expertise enables INPUT to supply practical solutions to complex business problems.

Formed in 1974, INPUT has become a leading international consulting firm. Clients include over 100 of the world's largest and most technically advanced companies.


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