

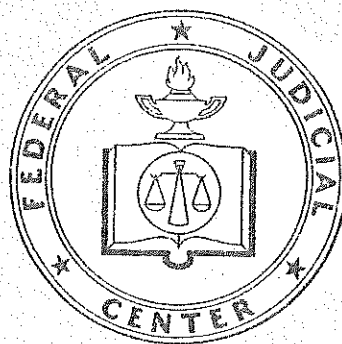
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FEDERAL JUDICIAL CENTER

EVALUATION REPORT

PILOT PROJECT ON COMMUNICATING AUTOMATIC TYPEWRITERS

June 27, 1973



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TABLE OF CONTENTS

	Page
Introduction	1
I. Project Objectives and Evaluation	2
II. Implementation	3
III. Evaluation	5
A. Questionnaire and Interviews	6
B. Communication Comments	9
C. Automatic Typing Comments	10
D. Conclusions	13
IV. Alternative Equipment	14
A. Facsimile Transmission	14
B. Automatic Typing	16

INTRODUCTION

At its meeting of April 22, 1972, the Board of the Federal Judicial Center passed the following resolution:

RESOLVED that the Director of the Federal Judicial Center be authorized to engage in a project experimenting with the use of magnetic card selectric typewriters with communication capabilities, by installation in the Temporary Emergency Court of Appeals for a period beginning as soon as they can be installed and continuing through Fiscal 1973, expending funds therefor in Fiscal 1972 up to \$1,000 and in 1973 up to \$32,4000.

This resolution resulted from the concern Chief Judge Edward A. Tamm had expressed for delay in transmission of proposed opinions and emergency motion papers among the widely-scattered judges of the Temporary Emergency Court of Appeals (TECA). The Center, in cooperation with the TECA Clerk's office, arranged for installation and payment as authorized. All units were operational by October 1, 1972; most were in use before that.

The equipment employed has two major capabilities, whose value to judges will be examined here. In the first place, the system includes an IBM Mag Card Selectric Typewriter (MCST), an advanced automatic typewriter that creates a magnetic record of all typing done while the proper magnetic card is in place. This makes it possible to correct errors or make changes by retyping the new material only. Thus, a long opinion or other document can be redrafted by typing corrections only, retaining all unchanged material from the card. Repetitive typing of a single document many times, with or without changes, is also much facilitated. In addition, the equipment uses a communication connection through the Western Electric 103A Data-Set. This permits the MCST's to "talk" to one another: to send documents from one installation to another over telephone lines. In order

to send a document, a secretary contacts the receiving office by telephone (using the Data-Set, one component of which is a telephone), places the receiver in the cradle provided, and transmits the document directly from the card on the sending typewriter to the card and typing mechanism of the receiving machine.

This pilot project has received outstanding cooperation throughout from many people. Chief Judge Tamm has supported it vigorously, both in directing its implementation and in freely providing the benefit of his experience while the present evaluation report was in preparation. The TECA Clerk's office has been most helpful at each stage, both under Mr. William Whittaker, the first Clerk of Court, and under Mr. Thomas Napton, his successor. Each Judge of the Court was generous with his time in providing information on his experience, as was each secretary. Finally, Mr. Leo M. Timms, Jr. of IBM provided admirable assistance at every stage.

I. Project Objectives and Evaluation

The "Procedures Handbook" (Appendix A) prepared by the TECA Clerk's Office for use of this equipment lists the following objectives for use of the equipment:

1. To facilitate revisions to opinions and reduce the effort to prepare such revisions.
2. To permit transmission of a proposed opinion and revisions thereto in a minimum time.
3. To reduce unnecessary retyping of opinions.
4. To permit immediate filing of an opinion after concurrence.
5. Easy and rapid revision of all other typing, permitting all typing to be done at maximum speed.
6. Immediate transmission of emergency matters, especially emergency motions.

The above objectives concern both the communications capability and the automatic typing capability of the equipment. However, the communications factor originally was the

main source of Center interest. TECA has nationwide jurisdiction and its nine judges have chambers in all parts of the United States. The court was established in response to an expected heavy load of appeals involving alleged violations of the Economic Stabilization Program. Its procedures are innovative in several respects, as the court Rules show (Appendix B).

The new communication system funded by the Center is one of those innovations. TECA appeared to present in an especially acute form the communication problem common to several of the United States Courts of Appeals. Judges often have their principal chambers in widely scattered locations. When a draft opinion is submitted to the two other panel members for approval or suggested revision, it must pass through the mails at least twice (for the unavoidable single round trip). In a complex case there may be a great many mailings for multiple revisions before a final version is agreed upon and filed. Mr. William Whittaker, the first Clerk of TECA, estimated a potential saving with this equipment of 2 - 5 weeks in this "sub-decision time." Chief Judge Tamm has made a strong case also for telecommunication of emergency motions papers (Appendix C: letter of March 9, 1972 to Hon. Rowland F. Kirks).

The organization of this report will be as follows. First, it will discuss the implementation of the pilot project, showing especially some respects in which this application of the equipment has been more or less unique. Second, it will evaluate the application using the available data. Finally, it will examine some alternative equipment and services that could be used. It is hoped that in this way the experience gained in this project can be useful to the widest possible variety of possible application in the judiciary. As it happens, the automatic typing aspect of the MCST's has been much more useful than the telecommunications. For that reason, more attention will be given to automatic typing than was first anticipated.

II. Implementation

Judge Tamm and Mr. Whittaker made every effort to assure that the equipment would be fully understood and used to best advantage by all involved. From October 30 to November 1, 1972 TECA held a seminar for all TECA judges' secretaries in Washington, D.C. This was shortly after installation of all units was complete, but before any opinion but one had been filed for TECA. A copy of the "Report" on this seminar

is attached as Appendix D. As that report says, "During the planning for the mag card project itself it was realized that as a pilot program the project would not be effective unless full commitment was obtained from the people who would be operating the equipment. The sophistication of the equipment, the necessity for adopting new procedures and processes, and the natural resistance of people to changing life long habits provided compelling reasons for holding a meeting of all of the operators in one location rather than individual on site instruction."

The seminar included talks by Judge Tamm, Mr. Whittaker, and Mr. Joseph Ebersole, Director of Innovation and Systems Development at the Federal Judicial Center. Significantly, the participants divided several times into small groups to discuss the equipment, especially with regard to its place in their offices and in their own procedures. These groups then reported back to the whole seminar. Thus, each participant had an opportunity to express any reservations or dissatisfaction, and all reactions were thoroughly aired before the group. These activities were in addition to 6 - 8 hours of "hands-on" training on all aspects of the equipment. The intent of this rather innovative agenda was to encourage each participant to examine her own work in detail in relation to the MCST's capabilities. Secretaries, being as naturally conservative as anyone else, often resist new equipment that requires them to change long-established patterns. Often, as a result, an MCST may be used only for one or two purposes without tapping the full range of its capabilities.

As their final task, the participants prepared a draft of the "Procedures Handbook" already referred to. Among other purposes, this handbook was intended to help sustain the commitment to the project that the seminar engendered. It also set up a standard format for documents transmitted by MCST. Apart from the general need for uniformity, the format was needed because this equipment requires that the receiving station have the same margins and tab settings as those on the document being received. The remaining chapters of the handbook established certain transmission standards and instructions, and set up procedures for documentation of equipment usage.

Clearly, the implementation of the pilot project was carefully planned and executed, more so than could be expected of more routine applications should comparable equipment be widely used in the judiciary. To that extent, we should expect better results than could be expected without this special effort. On the other hand, the pilot project was unique in that the equipment was not ordered at the initiative of all of the users. Since the system was installed for the whole court, there were several participants who were lukewarm at best from the start. Normally, new equipment can only be obtained as a result of strenuous effort by the user, which assures more enthusiasm.

III. Evaluation

As originally conceived, the project was to be evaluated primarily from quantitative reports filed by each user concerning opinion transmission and general typing usage. Opinion transmission was the primary concern. The handbook describes the necessary procedure for both reports and an ample supply of the necessary forms was distributed. (The forms are attached as Appendix E.) However, events forced a change in the evaluation procedure. In the first place, the number of opinions filed has been a small fraction of the anticipated load. Not only have fewer appeals been filed than expected, but two other factors have reduced the number of opinions filed. First, the dismissal rate of TECA has been 68%. In addition, many cases have been terminated without written opinion in accordance with TECA policy. Thus the number of opinions circulated among the judges has been small enough that the communications system has been used only intermittently. The data base is too small for any meaningful quantitative analysis.

The reporting of local (non-communications) use of the typewriters was rather uneven for November 1972 through January 1973, and after that very few reports came in. (The reports for those months, with an attached summary prepared by the Clerk, are attached as Appendix F.) These reports were designed only to show the number of hours of usage and the number of pages typed. Unfortunately, control over preparation was not sufficient to assure that the reports are comparable. The variation among them is so great, and so counter to other evidence, that they appear to be useless. For example, one station (with an excellent typist

who uses the MCST well) reported a page rate of only a little over two pages per hour. Others are as high as ten per hour. These differences appear explainable only in terms of reporting differences in what constitutes one "page". Possible variations include different ways to count memos, forms, and other short jobs; counting finished output only, versus including all versions; and simple inaccuracy of estimates.

A. Questionnaire and Interviews

As it became clear that the original effort to accumulate quantitative data was not satisfactory, the Center decided on a different approach that more emphasized the qualitative response of users. Dr. Steven Flanders of the staff visited five of the ten installations (four judges' chambers and the Clerk's office) making a particular effort to include any where dissatisfaction was reported. He spoke with both the judge and the secretary in each instance. All other judges and secretaries were asked to respond to a questionnaire (reproduced below) that addressed some of the same questions. The earlier interview responses and the written responses were then categorized together. The questionnaires as sent out requested verbal responses which are summarized here along with the interview response in the somewhat arbitrary categories that appear after each question. "Do not know" responses are not listed. Some detailed comments these questions elicited will be discussed.

Judges' Questionnaire

1. What value, if any, has the communication capability of the equipment had for you?

Substantial	-	0
Small	-	4
None	-	5

2. Suppose that (1) the TECA caseload were in the range originally anticipated, and (2) all TECA judges' secretaries were using the

equipment regularly to transmit all proposed opinions. What value, if any, would the communication capability have had for you under those conditions?

Substantial	-	0
Small	-	5
None	-	3

3. What value has the equipment had for you as an automatic typewriter, exclusive of the communication link?

Substantial	-	6
Small	-	2
None	-	1

4. Would you recommend a similar installation with communication capabilities in the chambers of all judges in your circuit? Why, or why not?

Yes	-	0
No	-	7

5. Would you recommend installation of magnetic card typewriters without communication capabilities in the chambers of all judges in your circuit? Why or why not?

Yes	-	5
No	-	2

Secretaries' Questionnaire

1. Do you use the MCST for all your typing? Why or why not?

Yes	-	9
No	-	1

2. Under what conditions, if any, do you use the machine without using a card? Why?

Usually faster without card	- 1
Minor jobs only	- 7
Always use card	- 2

3. Excluding the communication aspect, do you now ever find the machine more trouble than it is worth?

Yes	- 2
No	- 8

Did you when it was first installed?

Yes	- 8
No	- 1

4. Again excluding the communication aspect, what value has the equipment had for you in opinion preparation?

Substantial	- 7
Small	- 0
None	- 2

In other typing?

Substantial	- 7
Small	- 1
None	- 1

5. What percent (approximately) of draft opinions sent from your judge's chambers to other panel members have gone out via the MCST?

(Answers are unclear; apparently slightly more than half of all opinions have gone out over the MCST.)

When is mail more advantageous?

Usually	- 3
Often	- 2
Rarely	- 1

6. Have you transmitted other communications with MCST?

A few	-	8
None	-	1

7. Suppose that (1) the TECA caseload were in the range originally anticipated, and (2) the MCSTs were being used to transmit all proposed opinions. What would be the value, if any, of the communications procedure?

Substantial	-	1
Small	-	5
None	-	1

8. Briefly describe all maintenance problems you have experienced.

	Communication	Other
Substantial	3	3
Little	2	3
None	5	4

9. What is your overall feeling about the equipment?

	Communication	Other
Favorable	1	8
Lukewarm	2	1
Unfavorable	6	1

The responses in interviews and on the questionnaires varied widely, and we received many very carefully considered evaluations. The discussion below will discuss some of the benefits and problems that were mentioned.

B. Communications Comments

Hardly anyone had anything favorable to say about the communications capability. It may be that there was no adequate test because so few TECA opinions have been filed.

However, two secretaries made the point that if the volume of transmission had been heavy, a second secretary would have been needed to free the judges' secretary for other work. Both judges and secretaries mentioned the time involved; it is clear that, at best, any saving in delivery time of MCST tele-communication over the mail must be weighed against the much greater secretarial time required. Undoubtedly, had usage been greater some lost time could have been eliminated through practice. However, the MCSTs are rather clumsy for transmission. Even if no difficulties arise, a transmission requires the attention of one person at each end throughout. Usually, the transmission must be stopped several times to change margins and tab stops (for quotations, tables, etc.) in addition to changes of paper and cards at each station after each page. The sender must do all this twice, once for each receiving panel number. The process requires that a large block of time be set aside at each station. Since this makes the secretary and the typewriter unavailable to the judge, the system is nearly as much hinderance as help, and probably would be at any level at volume of usage. Mail is particularly advantageous on long opinions or late in the day.

Further, no judge indicated that mail delay was a critical problem in timely filing of opinions. It is possible that what delay they have experienced they have perceived as delay on the part of judges rather than the mails. Mail delay, if substantial on an opinion mailed many times, would result from many mailings and might not be particularly disturbing at any one time. One judge discussed the communication system at length (responding to question 2 in the questionnaire above) without ever mentioning this problem. If the mails are delaying opinion preparation, the TECA judges, with one exception, do not consider this a very serious cause of delay. They are more impressed by the immediate irritation of losing the services of their secretary for extended periods.

C. Automatic Typing Comments

Response to the MCST as an automatic typewriter was much more favorable. Except for two instances in which the

experience was generally unsatisfactory - as discussed below - both judges and secretaries found the equipment valuable. A variety of benefits was mentioned. All agreed (including the two who were dissatisfied) that MCSTs are superb for their most obvious use: repetitive typing. Predictably, however, for their duties, no secretary reported a heavy volume of repetitive material. The most time-consuming typing tasks of Court of Appeals secretaries is preparing successive drafts of opinions. The MCST has four major benefits in this process that were mentioned;

1. Saved typing time (all unchanged material is played back from the card).

2. Saved proof-reading time (unchanged material is not proof-read after the first draft).

3. Improved opinions (several judges reported that they now make changes more freely, knowing that a redraft can be prepared with minimal time and effort).

4. Secretary's job much less burdensome. (Several secretaries reported that multiple drafts had been a severe drain on their energies and patience in the past. Since each draft could be the final, it must be exhaustively proof-read and corrected to be letter perfect. Release from that demand prompted one to say, "If the machine goes, I go!")

Several judges and their secretaries consider the MCST indispensable. The Chief Judge, whose committee work entails especially heavy correspondence, is confident the efficiency of his office has increased 50%, and feels the work could not have been done without it. Another judge expressed a similar view despite substantial difficulty in the early stages. Not only did he experience a series of mechanical failures but his secretary found the machine difficult to use for several months. Several have been quite ingenious in using the machine. In one case, law clerks are able to make suggested changes at night or over a weekend and prepare a new draft opinion alone.

Various reservations were also expressed, however. The MCST requires any typist to make some change in established patterns. If the machine is to be used to maximum advantage, the typist's technique must be substantially rebuilt around the capabilities and requirements of this rather exacting device. What emerges most clearly from the responses to this project is that typists vary greatly in (1) their willingness to modify their technique into patterns that best exploit the MCST, (2) the speed with which they do so, and (3) the extent to which they do so. Two secretaries found the MCST very advantageous immediately, with greater and greater benefits with the passage of time. At the other extreme, one has never found it useful, and rarely uses a card at all. Another found the learning process slow and rather difficult, such that her typing was both slower and less accurate. This was despite a serious effort to learn to use the MCST to best advantage. She normally prepares rough drafts very quickly, striking out errors and typing corrections just beyond on the same line. Since this procedure leaves strike-overs on the card she had to abandon it. When she has only one or two characters to correct, she does so with correcting fluid, producing a final copy satisfactory to her judge without making a playback final copy. Thus, her "turn-around time" for dictation was increased on the MCST, much to the dissatisfaction of her judge. This, in combination with delays in communications that tied her up at times she was critically needed, caused by the judge to ask that she stop using the machine. It has since been removed; he describes the entire experience as "a mistake." However, this secretary now feels that with time the MCST might have been helpful to her. She indicated that IBM's training did not include adequate drill for her purposes.

The remaining secretaries found the machine demanding at first in varying degrees but entirely worth the effort. This was true even of one who disliked the machine from the start, left the training seminar early, had a series of mechanical malfunctions, and found the machine irksome for months. She reported (with a smile) that the machine almost induced a nervous breakdown, but it had been worth the trouble in the end. The varied responses suggested that MCSTs should

not be imposed; only secretaries who want one and help to make a strong case for one should have one installed. Also, a simpler automatic typewriter might be advantageous.

Some maintenance problems were reported. The original installation was faulty in that the first data-sets could receive but not transmit, so they all had to be replaced. After that, two stations were dropping some characters during transmissions, and had some difficulty between IBM and Western Electric service personnel in clearing the matter up. As just mentioned, one other station had a long series of problems. There were both mechanical and electrical failure of the MCST on several occasions, and a second faulty data-set. However, these problems are now fully cleared up. There were a few minor equipment problems at other stations. However, except for the one instance of poor coordination between IBM and Western Electric, all had excellent experience with service response. Reliability is not a problem except during transmissions, when various intermittent difficulties appeared. Again, it is possible that these could have been a result of the low volume of transmission, but we have no evidence on this

D. Conclusions

Briefly, the conclusions of this pilot project are:

1. The MCST communications feature has no value in U.S. courts of appeals. Some alternative tele-communications equipment is discussed in the next section.

2. The MCST typewriter can be very valuable in circuit judges' chambers if the typing load is heavy enough to strain one secretary and if the secretary especially wants this kind of equipment. While no strict cost-benefit analysis is possible here, it is perhaps relevant to point out that an MCST (at \$175 per month) costs roughly one-fifth a secretary's salary. While this is very high compared to conventional typewriters it is modest where an MCST enables the present secretary to discharge without delay a work load that would otherwise be excessive. IBM estimates it can increase productivity from 35 to 60%, figures that do not seem unreasonable based on the responses just discussed.

3. A number of alternative applications should be explored. Communications equipment of some variety might be valuable to link district court and circuit court clerk's offices to facilitate transmission of records. Also, automatic typing has many possible applications in the judiciary. At present, one circuit has an IBM magnetic tape machine in the clerk's office, both for preparation of opinions and for preparing such repetitive material as attorney notification letters and various orders. Many other applications are possible and probably desirable. The following are currently under consideration for various courts:

a. a circuit court wishes to install a machine for forms preparation and for opinion drafting;

b. a metropolitan district court wishes to obtain three machines to be used jointly by six judges in opinion preparation and other typing;

c. a smaller district court wishes to obtain a machine for general office use.

IV. Alternative Equipment

Two kinds of alternatives merit discussion here. First, as a result of this project some interest developed in facsimile transmission technology, a logical alternative to MCST's for communications. Second, there are several other automatic typewriters on the market, some of which may be more advantageous in courts. While this discussion cannot do more than survey these markets, hopefully a survey will be useful in suggesting possibilities. The market in these fields is so large, and it changes so fast, that a precise comparison of all aspects of all possibilities would be very lengthy and would fast become out of date.

A. Facsimile Transmission

Facsimile transmission devices scan the page to be transmitted optically, transmitting an electronic code representing the degree of "blackness" of each spot on the page. Thus they transmit any image, including pictures as well as characters. On the other hand, they must scan the entire page in fine detail if adequate resolution is to be provided.

This is a comparatively inefficient use of the limited data capacity of telephone lines. The result is that transmission time is slow: three, four, or six minutes per page for higher-resolution copies at 88 lines per inch; depending on equipment used (and price). A copy made at 88 lines per inch on Graphic Sciences equipment is attached, with Graphic Science brochures, as Appendix G. On many machines, copying at less than six minutes per page can be accomplished only at a sacrifice of resolution. All but the top of the line models require that paper be changed after transmission of each page. Prices (from GSA schedules) begin just under \$50 per month for machines that can handle legal size paper. The Graphic Sciences dex 1, for example, is \$47.50 per month, transmits at six minutes per page, and requires manual replacement of paper after each transmission. For \$66.50 per month the Xerox Tele-copier 3 provides a roll-feed system that can receive multi-page documents unattended; it cannot transmit unattended, however.

Generally speaking, these machines appear to share the disadvantages of the MCST's for communication. They are slow enough and demanding enough that to send a long opinion would take a large block of a secretary's time. On the other hand, their copies are much less attractive than those of conventional "Xerox" machines, not to mention the superb typed copy the communicating MCST's produce. They are designed for frequent transmission of short documents, and are best for pictures or charts. In contrast, judges transmit at irregular intervals, and they send long documents, usually without graphics.

It has been noted that the TECA judges do not find mail delay a critical issue. However, it can be critical for occasional emergency matters. For this purpose the best solution often may be to use the FTS facsimile system. FTS maintains equipment in 67 federal buildings (many of them courthouses), manned by personnel with "top-secret" security clearance. The rate is \$1.50 per page. Transmissions go only from one FTS station to another, so an arrangement must be made for someone to pick up material at the receiving station. FTS uses standard Xerox equipment compatible with many machines on the market. This opens two interesting

possibilities. First, if a document is to go to or from a location distant from the nearest FTS station, FTS can use any of a large number of privately-owned stations. Second, if a particular court should acquire a machine compatible with FTS it could communicate with others through the FTS system.

B. Automatic Typing

There are many other automatic typewriters on the market, several of which have been examined for this report. The MCST, by way of comparison with those to be discussed, rents for \$175 per month, plus \$65 per month for its communications capability. The Western Electric 103A Data-Set rents for about \$30 per month in addition; the exact tariff varies from one part of the country to another. As mentioned, the MCST uses one reusable magnetic card for each typed page (cards cost \$25 for 20). It includes a heavy-duty Selectric specially fitted with controls for automatic typing. As has been suggested, it makes rather specific demands of the operator, many of which require significant changes in typing pattern for most typists.

The Savin model 900 Word-Master (Savin Business Machines, Vallalla, New York 10595) is the least expensive machine in this group. (Brochures at Appendix H.) Just how inexpensive is unclear because it carries a charge of \$0.0076 for each line typed, in addition to equipment rental. For the first six months the minimum rental is \$93.10 per month and the maximum, including the per line charge, is \$122.50 per month. The standard price, however, goes to a maximum of \$171.50 per month. A user would pay the maximum for 14,829 lines or more in a month, or about 500 double space pages. The Savin system consists of a small control unit that is placed on a desk beside a standard Selectric typewriter. The unit controls the typewriter through a special baseplate that is installed on it by Savin personnel. The typewriter itself, however, can be a Selectric presently in use; it is not provided by Savin. The control unit creates its record on a cassette tape, each of which stores "up to" 12 pages. Tapes cost \$9.25 each; less in quantity. Savin claims that corrections can be made much more easily on its system than on the MCST. Such claims are difficult to appraise without extensive experience with both machines in a

particular application. However, the Savin at worst is no more troublesome than the MCST, and may well be easier. IBM, on the other hand, points out that Savin uses typewriters not especially designed for heavy-duty use, so they feel more maintenance problems can be expected. Savin has one unique feature that could be valuable in some settings. The control unit can be plugged into any baseplate, so it is possible to obtain one control unit and several baseplates. Thus automatic typing would be available to several typists. The Savin system has no communications capability.

The Wang System 1200 automatic typewriter offers a combination of features and price that appears exceptionally attractive for many applications in the judiciary. (Wang Laboratories, 836 North Street, Tewksbury, Mass. 01876; brochures at Appendix I.) The Wang, which employs a heavy-duty Selectric, also uses tape cassettes, but each holds 40 pages. A model using a single tape station rents for \$175.00 per month; with two stations the rental is \$225 per month, plus options in both cases. 18 tapes are provided; additional cassettes cost \$75 per dozen. The Wang offers a very flexible corrections capability because it does not write on the tape until a line is completed. Instead, it stores all information in a 400 character memory awaiting changes, and readily permits shifting and skipping words, phrases, etc. that require adjustment. The Center invited Ms. Ruth Jacobsen, the Deputy Clerk of TECA who has been at the hub of many of the TECA transmissions, to a hands-on demonstration. Based on her considerable work with the MCST she felt that the Wang system was substantially easier both to use and to learn to use.

A number of Wang features deserve comment. It has an automatic centering feature that will center any line automatically on playback. It also will align columns of figures automatically. More significantly, it has an outstanding "search" capability. It will skip forward on the tape to any line if the typist types in enough characters from the start of the line to identify it uniquely. For example, if this report were on a Wang tape, the first line of this paragraph probably could be reached by typing in "a number." The machine

would skip through the tape and stop at that point, awaiting corrections or prepared to type from that point. To find that point on an MCST would require finding the proper card for the page, counting to the line, and skipping lines on the card until the proper one is reached. Wang's search capability permits indexing of material for repeated use on the basis of any existing system. Docket numbers could be used. Particularly with the two-station version this capability offers interesting possibilities for repetitive work including merging material at various points on the tapes. A list of attorney names and addresses could be on one tape, a series of form letters on the other, and a series of different letters could be prepared very quickly. For correction of opinions it would be one of the fastest and easiest systems in reaching a particular spot.

The Wang system includes a "justify" mode that could be especially valuable in judges' chambers. Playback in this mode creates a copy in which both margins are aligned, as if prepared on a composing machine. Apart from the general desirability of attractive copy, this would be especially valuable to courts that prepare their distributed opinions from a typescript, or that contemplate doing so. Two circuit courts have given up hot lead printing in favor of offset or mimeo opinions. Those possibilities would be more attractive if the final copy were prepared on a Wang system in "justify" mode.

Wang is now (June, 1973) installing the first units with communications capabilities, using a system that appears to offer the most desirable combination of features for court application currently available. This option rents for an additional \$75 per month (not including Data-Set) and can be attached to existing Wang 1200 systems. It transmits from tape to tape, without using the typewriter, at 133 characters per second. With this capability a whole document can be transmitted, without operator intervention, and can be played back by the receiver at any time. This would eliminate the scheduling problems of MCST transmission. Also, the Wang typewriter sets its margins and tabs automatically from taped information. This would eliminate the coordination problem that proved irksome in several TECA transmissions. The Wang

receiving station can be left for periods of time with its line open (with no telephone time charge), so no handling at that end would be required at all when communication is being received.

Another system surveyed is the Ty-Data Series 3600 machines (Ty-data Inc., 109 Northeastern Blvd., Nashua, N.Y. 03060; see Appendix I). Like the Wang, these are self-contained cassette machines that include a heavy-duty IBM Selectric typewriter. Also like the Wang, the system is available in two versions, though they are somewhat more expensive than their Wang counterparts. The one-tape version is \$181.30 per month, the two-tape version \$259.70 per month with two cassettes included. Cassettes cost \$7 each. These systems also have a powerful "search" capability. Using it requires that the typist place codes on the tape (not a difficult procedure), which is not true of the Wang. However, Ty-Data machines can search the tape backwards as well as forwards, a valuable feature in many applications. Otherwise they do not appear to offer substantial advantages comparable to the Wang features discussed.

Other machines are available which has not been examined for this report. IBM has several other systems, both card and tape (Appendix L). Litton is introducing a very powerful system at \$260 per month. There is an Olivetti system (Appendix K) which has a "justify" feature, there is a Rand system, and there are others as well. It is not possible here to identify a "best" system. Applications vary, sales and service facilities do also, and machines are constantly being introduced and withdrawn. While the Wang system seems especially attractive for most applications, especially given its price, none have been installed in U. S. courts as yet (though some are contemplated). Thus we have no actual experience with Wang's reliability or with their service organization. IBM's reputation is excellent in those respects, and the service experience of this project has been generally favorable. That consideration could be governing in some instances despite the apparent advantages of other systems. The MCST, it should be noted, carries the same base rental as the Wang.

P-55-74

LIST OF APPENDICES
(Appendices attached to original
copy of report only).

- A. "Procedures Handbook for Communicating Magnetic Card Equipment."
- B. TECA General Rules.
- C. Letter of March 9, 1972 from Judge Edward A. Tamm to Hon. Rowland F. Kicks.
- D. "Report on the Seminar Held for Secretaries of the Temporary Emergency Court of Appeals on Communicating Magnetic Card Equipment."
- E. Usage report forms.
- F. Summary of monthly usage reports.
- G. Graphic Sciences sample copy and brochures.
- H. Savin brochures.
- I. Wang brochures.
- J. Ty-Data brochures.
- K. Olivetti brochures.
- L. IBM brochures.