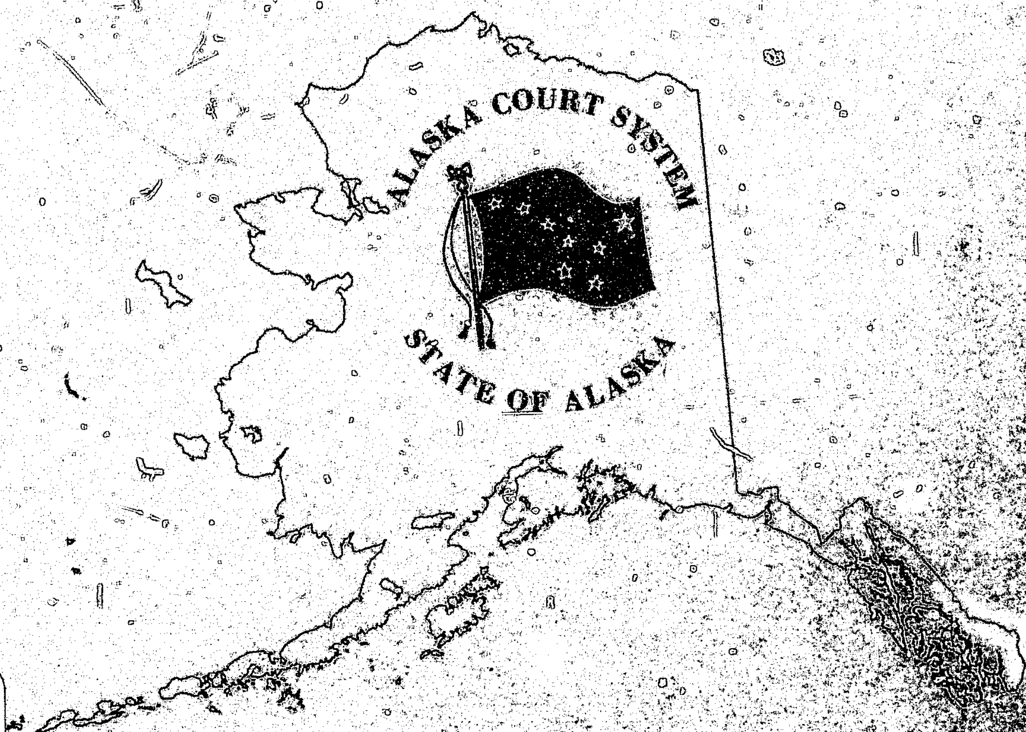
ALASKA COURT SYSTEM

ELECTRONIC COURT REPORTING IN ALASKA



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ELECTRONIC COURT REPORTING IN ALASKA

Conclusions: The Alaska Court System embarked on the total statewide use of electronic court reporting almost 20 years ago. While the decision to use this method of reporting was probably unavoidable for this state, it might have been unwise for other jurisdictions due to the relatively primitive nature of the recording art at that time. But now recording technologies have caught up with, indeed surpassed us. Today the quality of an electronic record is outstanding and the inability of the machine to modify what occurs in the courtroom makes it a more reliable recorder. Secondly, but importantly, electronic court reporting costs less than its manual counterpart.

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Electronic Court Reporting in Alaska

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FOREWORD

The Alaska Court System has been too long silent on its experiences with electronic court reporting. Not since 1970 has anyone in our system explained what we are doing in this area. Now, nine years later, much has changed. The purpose of this paper is to describe our almost 20 years of successful experience with electronic court reporting.

I. Historical Perspective

The earliest use of electronic recording of courtroom proceedings in Alaska took place in the territorial courts in the 1940's as backup for the court reporter. Instead of using the recording tapes found today, the recorders then used recording wire about the size of fishing line. When the wire broke it was spliced by tying the two ends together into a square knot. A single microphone was used rather than the seven used today. Despite their "pioneer" nature, playback today of taped proceedings recorded by them is surprisingly discernable.

The Alaska Court System was established at the time of statehood in 1960 and electronic recording was authorized in the Administrative Rules (see Appendix A) as the official record of all courtroom proceedings. The impetus for electronic recording of courtroom proceedings appears to have been both a shortage of court reporters and a feeling that the new court system should be started on a "modern" theme. The timing was ideal for this change. As an administrative director of the Alaska Court System later remarked:

> "Aside from the occasional rumblings by individual lawyers and one "anti" resolution from a local bar association, it can be said that the transition from manual court reporting in territorial courts to electronic recording in the new state courts became a fact before any effective resistance could develop. Too

many things were happening coincident to the take-over of governmental operations by the 'brand new state'."[1]

Thus was born the first statewide system of electronic court reporting. In discussing what has happened since it is useful to differentiate between the two parts of any court reporting system: (1) making the courtroom record, and (2) transcribing that record to another media, (usually a typed paper copy). The history of equipment maintenance will also be briefly discussed.

Recording of the Proceedings

The initial equipment selected was the Soundscriber, a recorder with a two inch tape which allowed 16 hours of uninterrupted recording and playback. It was single channel as multichannel units were not available in small packages at that time. The Soundscriber cost $1,300 a unit and required a mixer ($550) and five microphones (at $50 each) to operate in most locations. Forty units were initially purchased.

Court personnel were trained as the equipment was being installed. In late 1960 this first statewide electronic court reporting system was operational. It is important to note that the equipment in this system did not necessarily remain stationary in a specified number of permanent courtrooms. The equipment

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[1] Robert H. Reynolds, "Alaska's Ten Years of Electronic Reporting" (#56 American Bar Association Journal 1080 (1970)).

was carried all over the state to make records in the most remote of locations. It is almost incredible that the first statewide electronic court reporting system was initiated in a state spanning 566,000 square miles, with the most primitive transportation system in the country, and with a population so dispersed that, even today, there are only fifteen communities with populations exceeding 2,500. Yet it may well have been just such factors that made court reporters a scarce resource, particularly in "bush" or rural areas.

Prior to implementation of electronic court reporting, it was the responsibility of the court reporter both to make stenographic notes of proceedings and to type an official transcript when requested. Upon the implementation of electronic reporting in 1960, proceedings were machine recorded; court reporters were no longer responsible for preparation of the official record.

While the machines performed the recording duties of the court reporter, there had to be someone in the courtoom to operate the equipment and to perform traditional courtroom functions such as swearing in witnesses. In-court clerks had been used in addition to court reporters in territorial courts. These clerks were continued, but operation of the equipment was added to their duties. In addition to equipment operation and traditional courtroom duties, these clerks became responsible for keeping log-notes, a detailed record of courtroom events which are used to determine where on a recorded tape a particular courtroom event can be found.

It was quickly discovered that courtroom responsibilities

and associated out-of-court tasks only consumed a little more than half the in-court clerk's time. Thus the in-court clerk became a valuable resource that could be used in other clerical areas including, if necessary, transcription of the record.

The Soundscriber was not a high-fidelity recorder and, because it recorded on only one track, separation of participants' voices was very difficult during playback. It produced an acceptable quality record, but that quality was far below that of today's records. The machine soon picked up the nickname "sound scratcher". The company marketing the Soundscriber worked on such improvements as in-court monitoring of the record and multi-channel recording, but even with these modifications, rapid advances in recording technology led to the decision to change. The first attempt was not successful.

In 1970, 30 Dictaphone 061 units were purchased to be used in the Anchorage trial courts. These units had six-channel reel-to-reel recording and a playing time of three hours. They had many desirable features including protection against recording over an existing record, in-court tape monitoring, multi-channel recording, and channel (voice) separation during playback. But, due to severe maintenance problems, these units were used for only three years. In addition to maintenance problems, a radio frequency interference (RFI) problem caused poor quality on many of the records. (See Appendix B for a discussion of RFI). Finally, even when the Dictaphone 061 was working properly, it produced a record of only marginally better quality than that of the Soundscriber. And the price of the Dictaphone ($3500) was much greater than that of the Soundscriber.

In 1973 several other recording units were evaluated. The Akai four-channel reel unit currently in use was deemed a close second best, but because of the ability of the vendor to deliver 100 Akai units in a reasonable period of time, that unit was selected. (See Appendix C for a discussion of selection criteria). The hundred units were delivered in September 1973 and, by December of that year, installation of the equipment and training of the in-court clerks had been completed.

In 1974 sound reenforcement was added to most of the state's courtrooms. Sound reenforcement is the placement of microphones and speakers in a courtroom so that testimony can better be heard by the participants (See Appendix D for a discussion of sound reenforcement). At the same time wireless microphones were tested (See Appendix E for wireless microphone information). During the past six years, increases in state revenues from the oil pipeline allowed the State to rebuild or modify every major courtroom location with the exception of Fairbanks. This created the opportunity to work with architects and contractors to design these courtrooms to incorporate optimal electronic recording environments (See Appendix F for a discussion of courtroom construction required to facilitate electronic recording).

Transcribing: Typed transcription of the electronic record was only required when a case was appealed or in relatively infrequent special circumstances. Therefore, in about 95 percent of the cases the electronic version of the record proved to be sufficient - there were no requests for typed copies. But in the

remainder of cases, the electronic record had to be converted (transcribed) to a typed paper copy. Until the last few years, this transcription process involved the following steps:

1. An attorney or other party requests a transcript, citing where on the tape the proceeding he or she is looking for can be found. This location can be found by looking at log-notes placed in the case file.

2. A transcriber finds the applicable tape, locates the portion to be copied, listens to that portion of the tape, and types everything he or she hears.

3. The transcriber edits the transcript for typing errors.

4. Another transcription clerk listens to the tape, compares it word for word with what has been typed, and pencils in corrections on the transcript (proofing).

5. The transcript is retyped to correct all errors.

6. The completed transcript is xeroxed in the requested number of copies.

The history of the transcription process in Alaska provides a valuable lesson for other jurisdictions contemplating implementation of electronic court reporting. The responsibility for transcribing the record was initially given to the clerks of the trial courts. And in some rural instances, court clerks perform that function today. But the larger volume of transcript requests in Anchorage and Fairbanks led to the establishment of specialized transcription sections - the clerks in these sections did nothing but prepare transcripts. These sections reported to a statewide transcript supervisor who worked for the Administrative Director of the Alaska Court System.

Proofing was extensive. As a result, the rerun rate (the percentage of pages that had to be corrected) ran as high as 40

percent. But, as will be discussed later, most of these corrections were for typographic errors that were not critical to the meaning of the record. This led to the replacement of normal office typewriters with expensive magnetic card (magcard) typewriters which facilitated error correction. At about this time the transcription sections were removed from the Administrative Office and placed under direction of the Anchorage and Fairbanks trial courts. No documentation remains as to why the transfer was made.

High speed duplicators were acquired so that reels of tape containing the courtroom record could be quickly duplicated to cassette or other reel copies. The use of cassette rather than paper copies began to increase, primarily through the incentive of lower cost.[2/] But despite this factor, the backlog of pages to be transcribed and the time it took to transcribe them dramatically increased. A series of studies of the Anchorage section beginning in 1976 revealed the following facts:

1. Daily page production was below standards that had been established for purposes of job classification of transcribers.

2. An inordinate amount of time was spent on proofing the typed transcript even though about 90 percent of the pages corrected had no more than one or two non-critical errors.

3. The cost to the State of Alaska of having state employ-

[2/] Since public agencies receive their transcripts without any charge, the incentive for use of cassettes disappears. However, the speed for receiving cassette rather than typed transcript often operates as an additional incentive.

ees prepare transcripts was almost double that which would have been spent to pay commercial firms to prepare the same transcripts.[3/]

The first corrective step was to significantly reduce proofing, thus releasing more time to production. Since this dramatically reduced the number of pages to be corrected, the magcard typewriters were replaced with ordinary and less expensive typewriters. In addition, since the transcribers could no longer rely on someone else to catch their errors, they became more careful on the first typing.

Page production incentive plans were tried with little success. Despite the reduction in proofing, daily page production, while improved, continued to be less than needed to bring costs in line with the commercial sector.

The possibility of the state abandoning all trancribing and relying on commercial sources was seriously considered. The first step in this direction was to limit transcription services to state agency requests. All private transcript requests (principally civil cases) were routed to commercial transcription firms. In the process of preparing for the possible transfer of state requested transcripts to the commercial sector, some transcript clerks were moved to other parts of the trial courts when openings occurred. Several other transcript clerks quit, took jobs in commercial firms, or sought other vocations.

[3/] While there had been no commercial transcription services available when the Alaska Court System implemented electronic court reporting, by the time of this study there were quite a few firms providing such services.

Then a surprising transformation took place. Under the threat of extinction and having already been halved in size, the transcription clerks who remained began to produce as a group the same amount of pages per day as the entire section had produced a year before. One reason for this seems to have been that the clerks who were left were generally the fastest and most experienced. The "in-training" transcription clerks had left or moved to another part of the court system. The faster clerks that remained would naturally exert a peer pressure towards a higher level of production than before. The Alaska Court System's cost per page for transcription has significantly decreased.

There are two lessons to be learned from this court system's experience in transcription of the record.

1. Whether one uses commercial or in-house resources is a cost-benefit decision. The costs and the benefits need to be constantly monitored as they can change significantly.

2. A good transcription system need not use high priced typewriters or word processing equipment. Quality costs. Near perfect quality may be two to three times more expensive than adequate quality.

Maintenance: Since Alaska was (and still is) the country's least industrialized state, commercial equipment repair services were scarce. During the early years of its experience, the Alaska Court System relied on a combination of commercial maintenance and some in-house capabilities. Finally, in 1973, the choice was made to modify the newly purchased Akais. This, coupled with still relatively scarce and somewhat unreliable commercial maintenance, led to the establishment of the Electronic Record Main-

tenance section, an almost totally in-house repair capability. Jurisdictions in more industrialized states operating the more dependable equipment of today might find it unnecessary to establish such an in-house repair capability.

II. Electronic Reporting Today

The primary electronic recorder used is the Akai GX280D-SS model. There are also several Akai GX270D-SS and GX630D-SS models about. All recorders have been modified to slow the tape speed (thus allowing over six hours of recording per tape) and to remove the erase heads. A typical electronic recording configuration in the courtroom includes:

one reel tape recorder
seven microphones (one lavilier (lapel), one directional, and five omni directional)*
one microphone mixer**
three feedback controllers**
two four-channel amplifiers***
two ceiling mounted speakers*
one headset for monitoring

*Also used for sound reenforcement.
**Used exclusively for sound reenforcement.
***One used for sound reenforcement.

Most of the equipment is in the proximity of the in-court clerk who has all controls available. The microphones are located as follows:

Judge - one directional
Witness - one lavilier (lapel)
Jury Box - one omni directional
In-court clerk - one omni directional
Podium - one omni directional
Counsel table - two omni directional

The judge's microphone is mounted on a swivel stand. It uses a shock mount to minimize unwanted transmissions from the

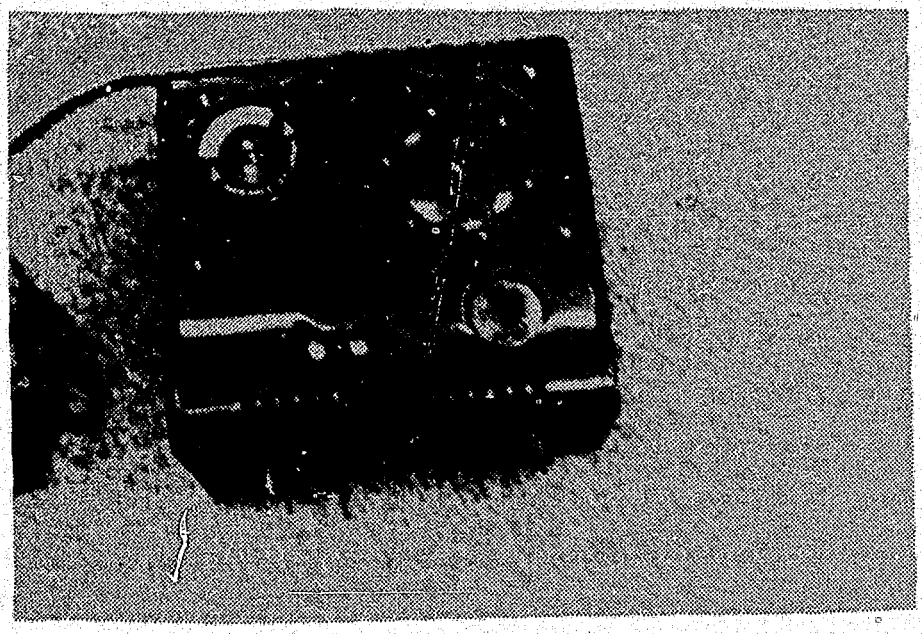
bench. The jury microphone is mounted on the jury box and the in-court clerk's microphone is on a desk stand in his or her area. Counsel microphones are mounted in foam holders on each counsel's table. The podium microphone is on a long floor stand. The entire recording and sound reenforcement system is activated by pressing one switch.

The in-court clerk's responsibilities regarding the equipment consist of cleaning the recorder, performing a test to ensure proper operation, turning the recorder on when the judge enters the courtroom, preparing the log notes, and monitoring the record as it is being recorded. The in-court clerk can easily anticipate the end of the reel and can change tapes in about 15 seconds.

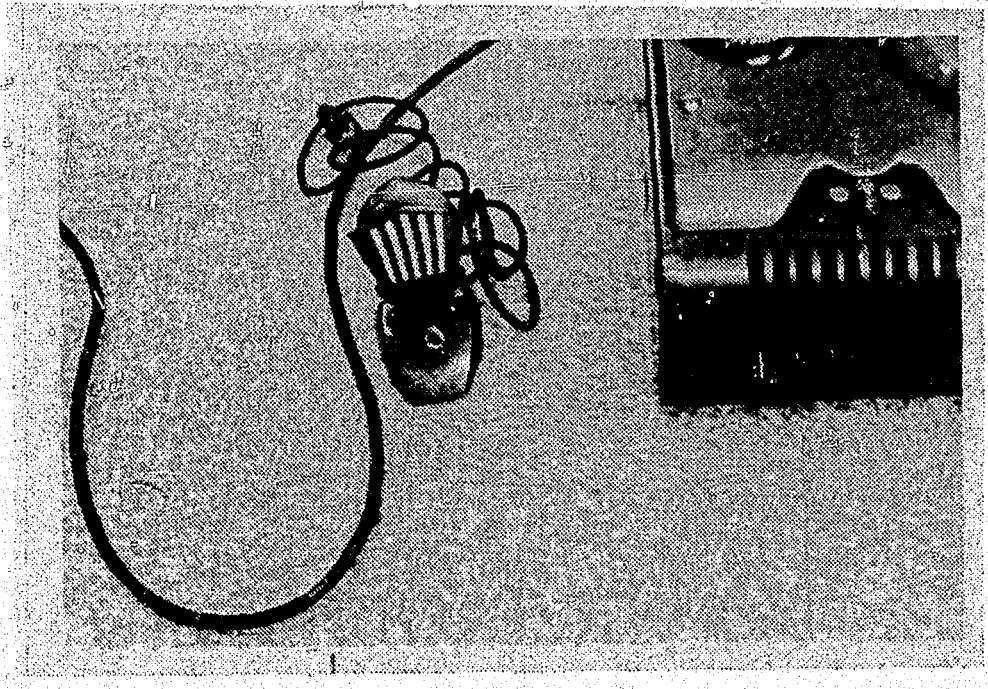
The log notes (See Appendix H) are a two part form. One is placed in the case file and the other serves as the daily journal of courtroom activity. After the tapes leave the courtroom, some of them are first used to produce cassette duplicates upon request for certain proceedings such as grand jury hearings. All tapes are stored in a tape library for future reference. No paper copies are produced except upon request.

The transcript sections in Anchorage and Fairbanks consist of a supervisor, several transcription clerks, a tape library, high speed duplication equipment, the recorders necessary for playback of the record, and other equipment such as typewriters. Services provided by the transcription sections include providing hard copy (paper) transcripts, providing reel and cassette tape copies of the record, making reel tapes available for parties to

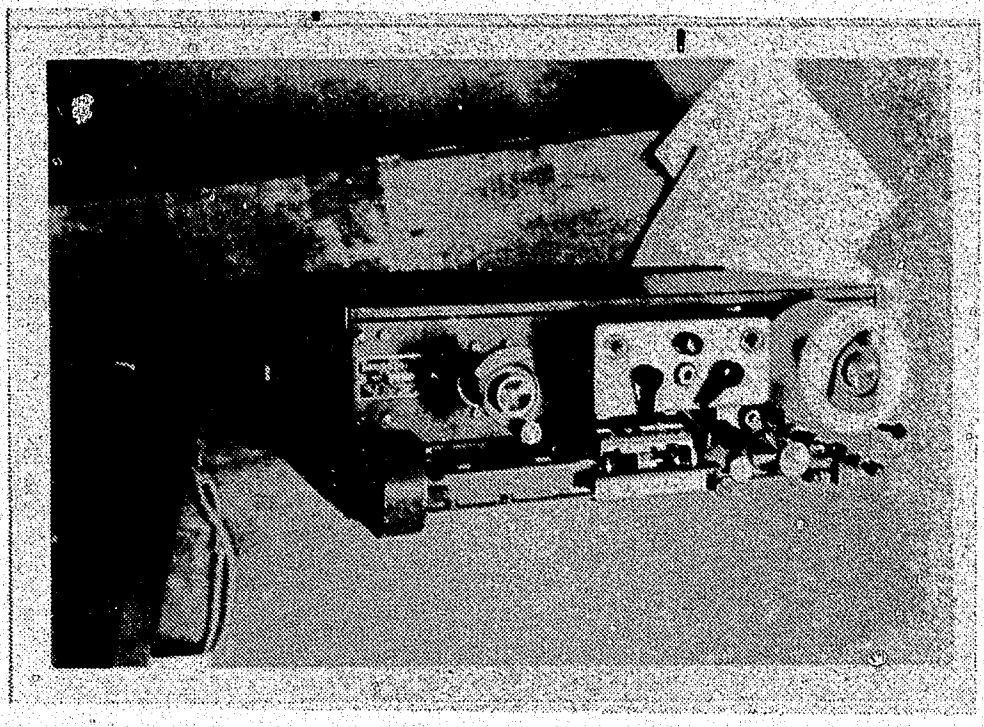
audibly reference the record, and helping parties find where on a tape a particular portion of a proceeding is located. The following few pages contain photographs showing portions of our electronics equipment.



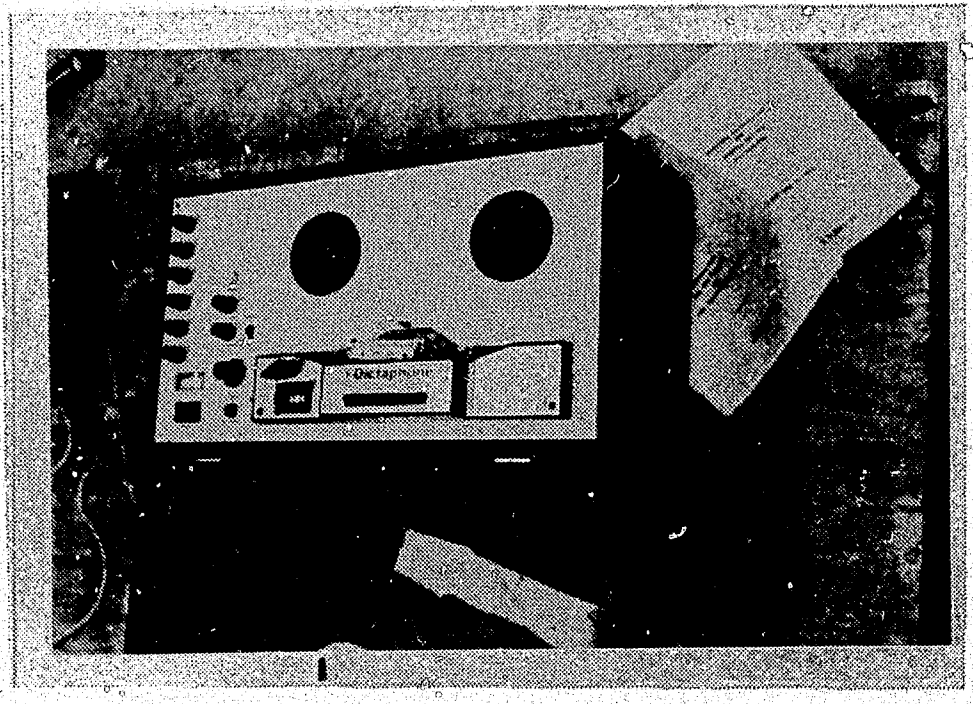
Early electronic recording device used
as backup for court reporters during territorial days.



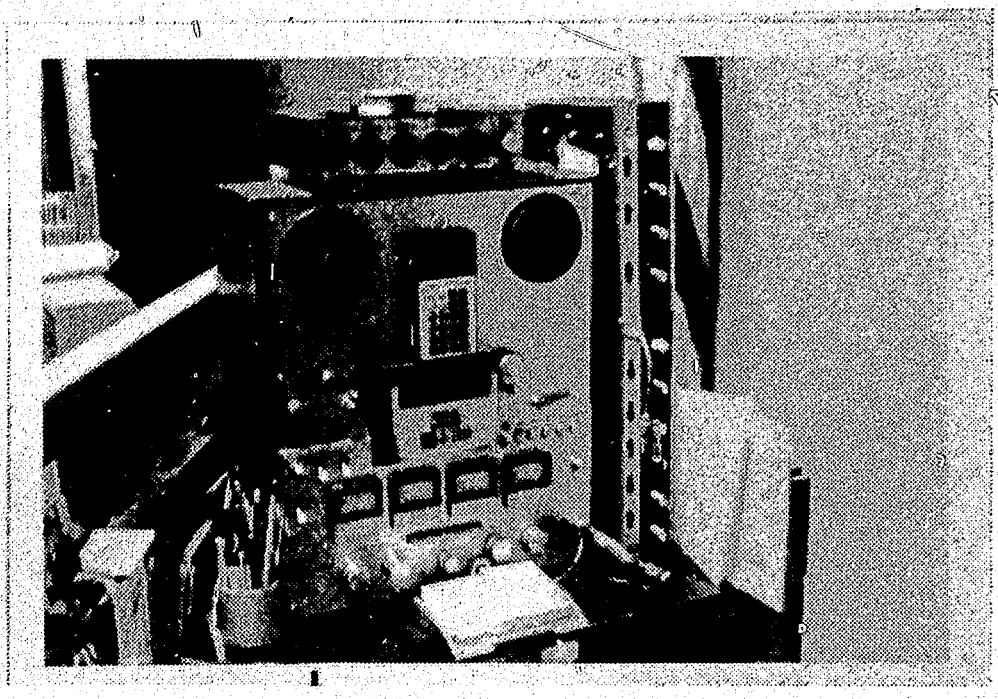
This early device used only one
microphone as compared with the seven used today.



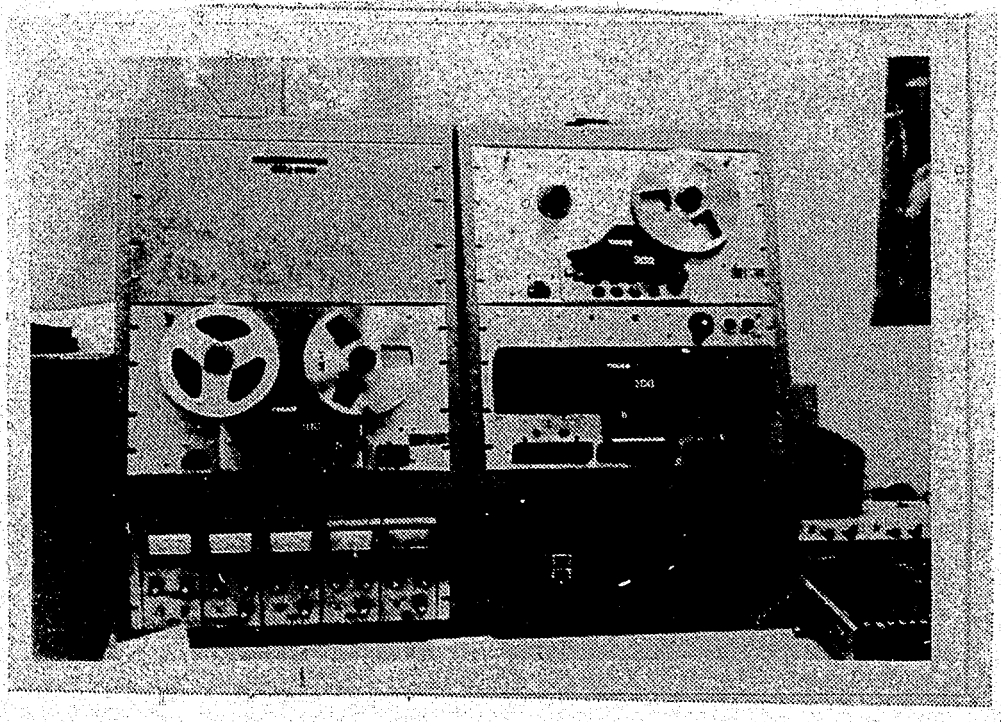
The Soundscriber used from 1960 to 1970.



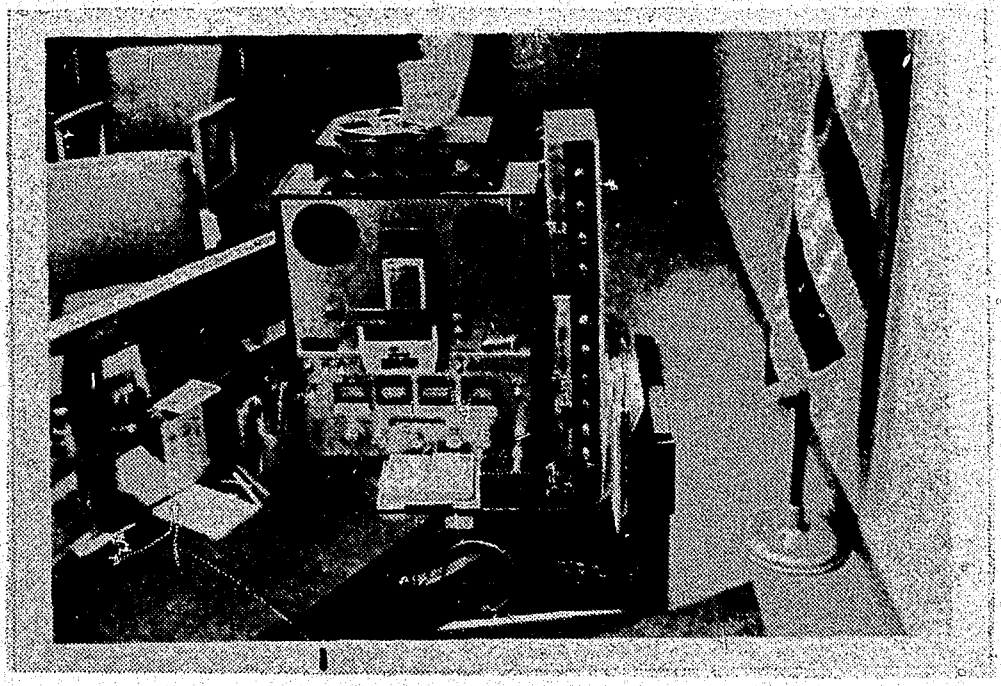
The Dictaphone 061 used in Anchorage
from 1970 to 1973.



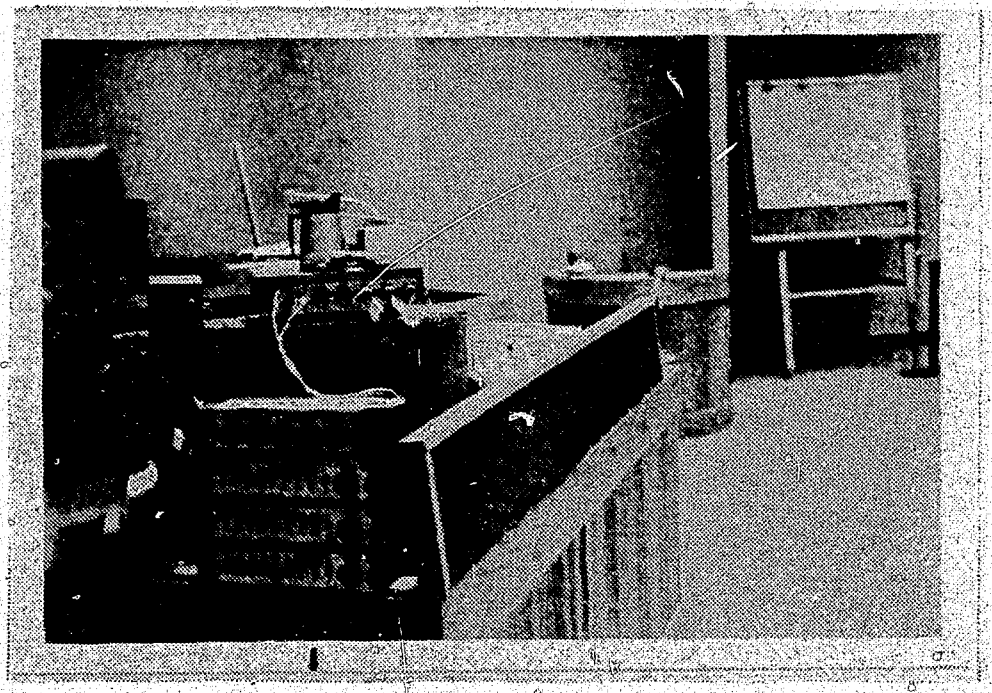
The AKAI unit currently
used since 1973



High Speed Tape
Duplicator producing both
cassette and reel copies of the record.

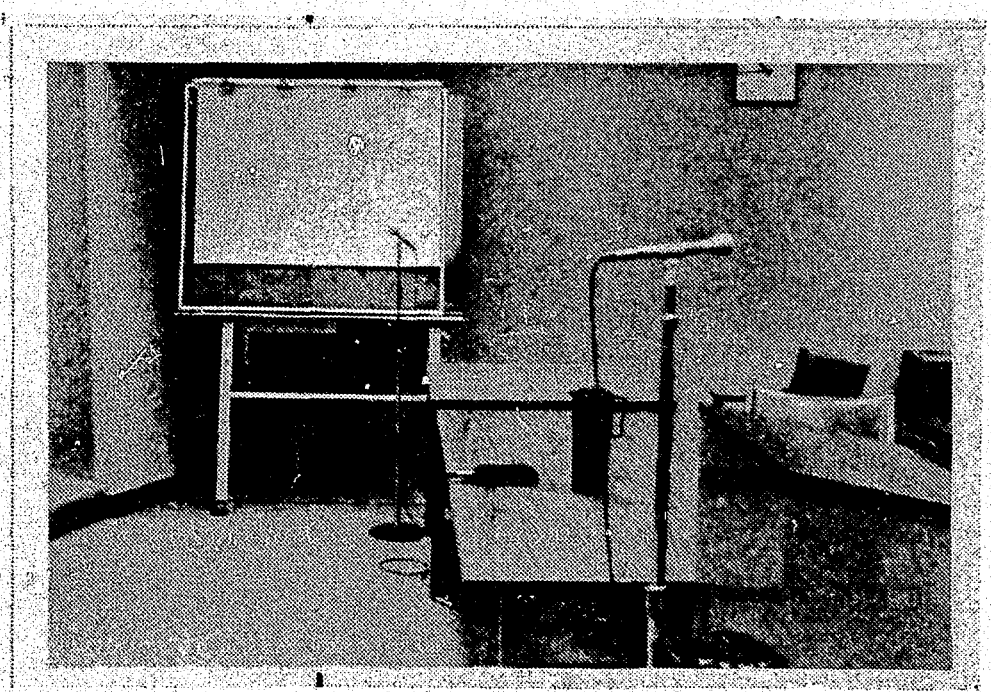


The In-Court Clerk's Area
All recording and control of the
microphone is done here.

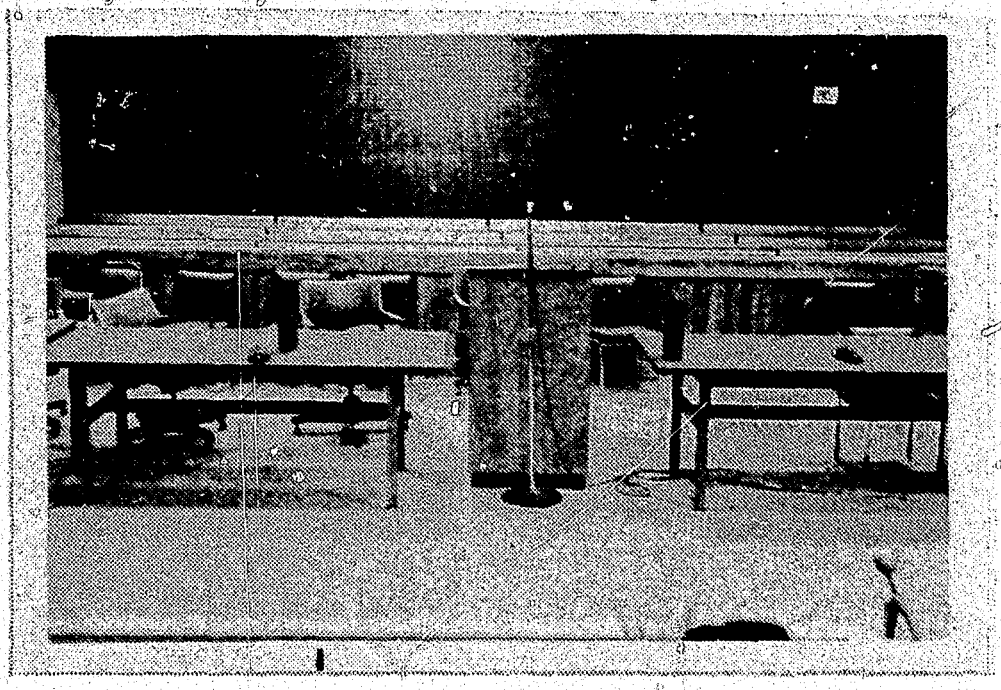


Another view of the In-Court Clerk's area.

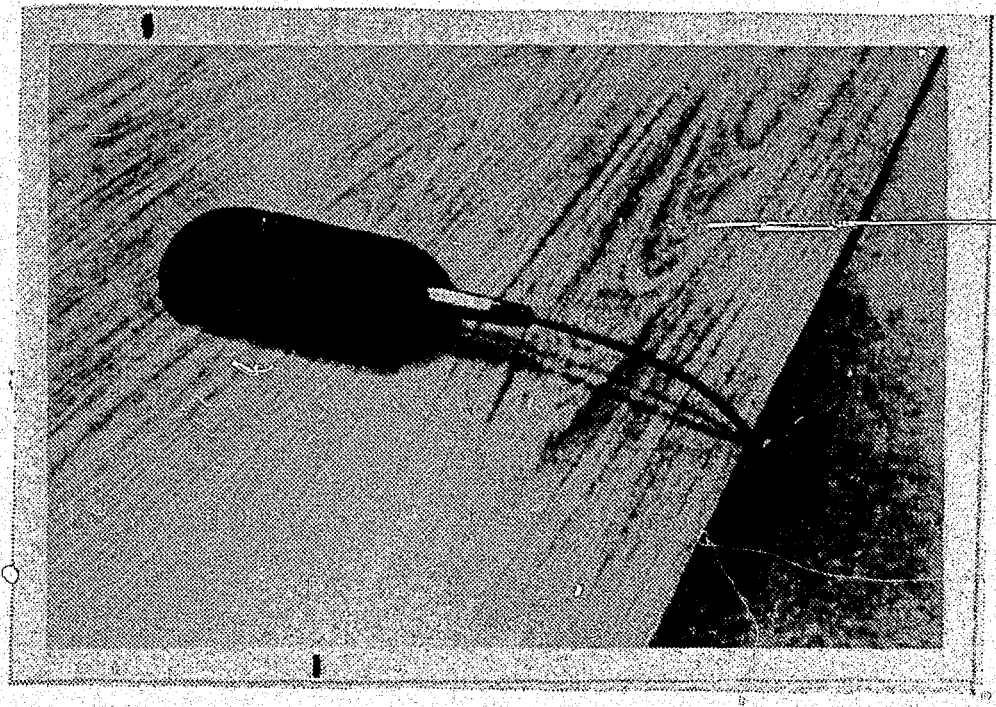
Bench Area Microphones



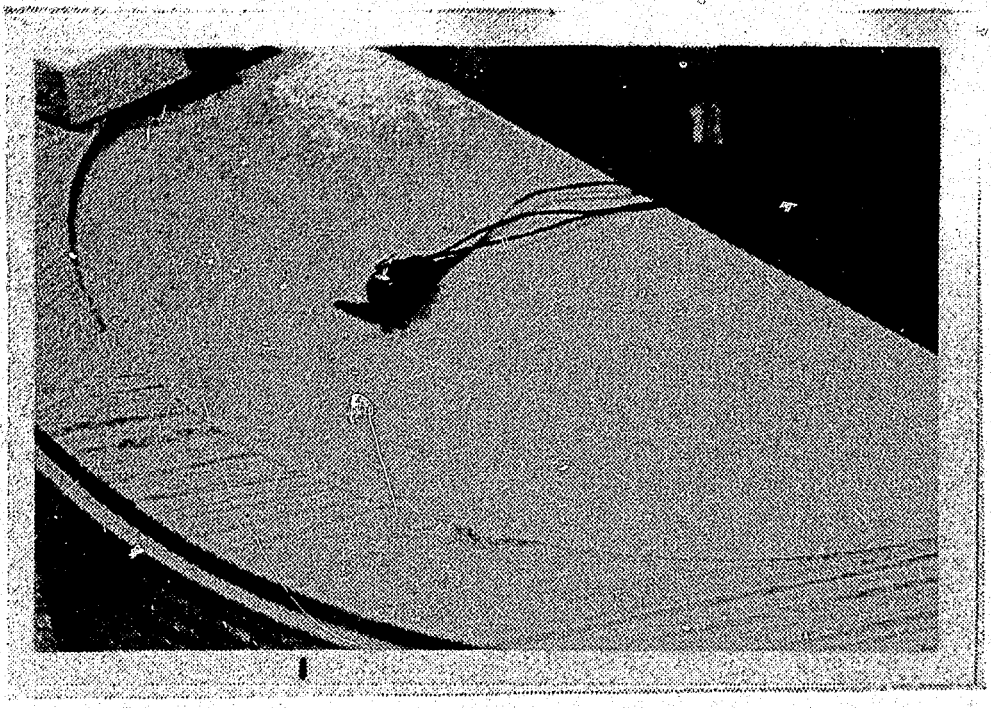
The Podium Microphone



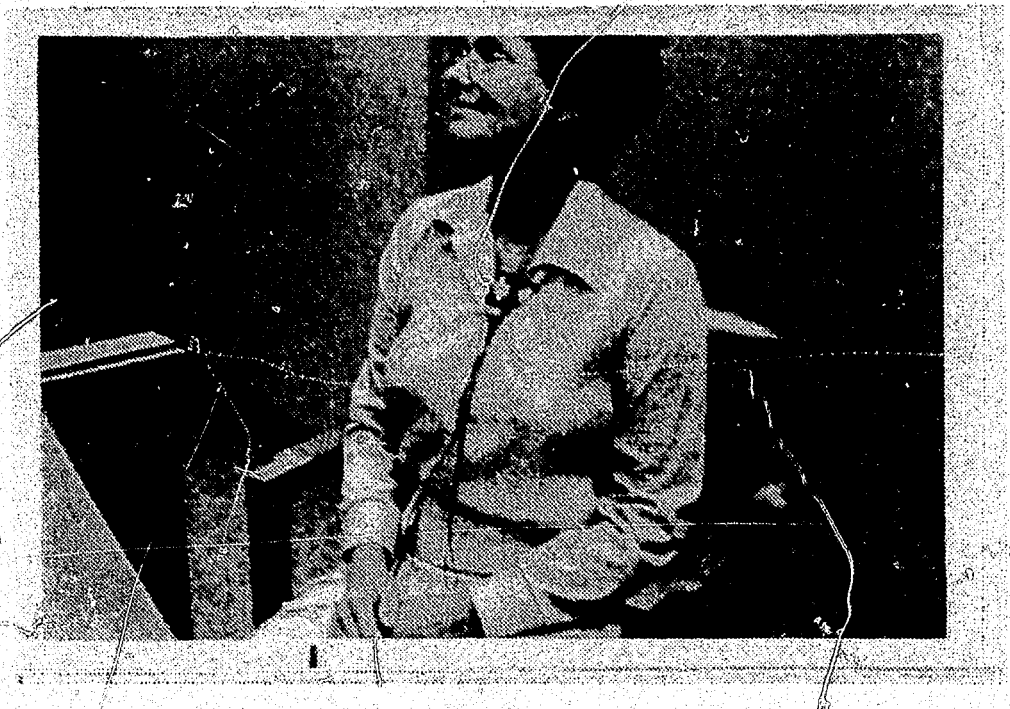
Counsel Microphone



These microphones are mounted
in foam holders.



The Witness Microphone



This microphone is attached to
the witness' lapel.

Transcribing the Record

The Electronic Record Maintenance
Section in Anchorage

III. The Cost of Electronic Court Reporting

The cost of electronic court reporting is less than its manual counterpart. The Anchorage trial courts will be used to illustrate this fact. The size of this court allows better delineation of the costs of preparing the record and of transcription. The primary costs involved are those of in-court clerks, transcription clerks, equipment, supplies and maintenance.

In-Court Clerk Costs: The Anchorage trial courts have 21 in-court clerks. The total annual personnel costs associated with these clerks is shown in Exhibit 1.[4/]

Exhibit 1
Anchorage In-Court Clerk
Annual Personnel Cost
(FY 1979)

Annual Salary	$365,400
Overtime	8,000
Fringe Benefits (@ 30%)	115,020
Total	$488,420

[4/] It could be argued that, since in-court clerks were used in addition to court reporters in territorial courts, they constitute no additional costs under electronic recording. It was decided to take the conservative approach of including in-court clerks costs in the costs of electronic recording and, later on, to also add these costs to one option of manual recording of the record.

Approximately 60 percent of the in-court clerk's time is spent in or out of the courtroom on tasks related to electronic recording. Another ten percent of the clerk's time is spent typing sentencing transcripts. The remainder of the time is spent on clerical matters unrelated to electronic recording or transcription. Ten percent of the total in Exhibit 1, or $48,842, will be allocated to transcribing. The remainder ($439,578) will be allocated to preparing the record even though part of the duties of in-court clerks are not related to preparation of that record. Since it is impractical to hire a part-time in-court clerk, electronic recording requires the hiring of a full-time clerk, even though only 60 percent of his or her time is required. Thus, all of the salaries except that devoted to transcribing must be considered a cost of preparing the record.

Transcriber Costs: The annual salary for transcription clerks is $117,000 and, with a 30 percent allowance for fringe benefits, total annual personnel costs for transcription comes to $152,100. All of these costs are directly related to transcription.

Equipment Costs: The equipment used has two configurations; one for recording in the courtroom and one for listening outside the courtroom. Exhibits 2 and 3 show the costs for each of these configurations.

Exhibit 2
Cost per Courtroom for
Electronic Recording Equipment

Type Equipment	Cost
Standard 4-channel recorder	$ 800
Modification for speed and recordover	150
4-channel amplifier	300
Headset	20
7 Microphones	455
1 Speaker	60
1 Headset	20
Total	$1805

Exhibit 3
Cost Per Listening Post
For Electronic Recording Equipment

Type Equipment	Cost
Standard 4-channel recorder	$ 800
Modification for speed and recordover	150
4-channel amplifier	300
Headset	20
Footpedal	60
Total	$1330

The Anchorage trial courts use 23 of the recording and 17 of the listening configurations. Nine of the 17 listening configurations are devoted to transcription of the record. This then adds up to an inventory investment of $52,155 for the 31 units used for electronic recording and $11,925 for the nine units used for transcription. As will be explained later, all Akai units will be modified to extend their life another five years (they

have been in use six years thus far). The cost of this modification will be about $400 per unit. Adding this cost per unit to the 40 units used, this brings Anchorage inventory investment for electronic recording to $64,555 and for transcription to $15,525. Prorating these investments over the conservatively estimated eleven-year expected life of the equipment results in a cost of $5,869 a year for electronic recording and $1,411 a year for transcription.

Supplies: Transcription supplies and equipment rental average about $23,000 a year. Recording supplies average about $17,000 a year.

Maintenance: The Anchorage trial court's share of maintenance performed by the electronic technicians is approximately $14,000 a year. Allocating this figure by the number of machines used in recording and transcription results in an allocation of $10,850 a year for electronic recording and $3,150 a year for transcription.

Total Costs: Annual Anchorage costs for electronic reocrding and transcription are summarized in Exhibit 4.

Exhibit 4
Anchorage Annual Cost for
Electronic Recording and Transcripts

Type Cost	Electronic Recording	Transcription
Personnel	$439,578	$200,942[5/]
Equipment	5,869	1,411
Supplies	17,000	12,000
Maintenance	10,850	3,150
Total	$473,297	$217,503

The $473,297 annual Anchorage costs of electronic recording can be transformed into several ratios as shown in Exhibit 5.

Exhibit 5
Electronic Recording Cost Ratios (1978)

No. Cases Filed	75,394	Cost per Case Filed	$ 6.28
No. Non-Traffic Cases Filed	23,061	Cost Per Non-Traffic Case Filed	$ 20.52
No. Judicial Officers	23	Cost Per Judicial Officer	$ 20,578.13

In analyzing transcription costs, the Anchorage transcription section produces about 55,000 hard copy pages a year. An additional 35,000 pages would have to be typed if cassettes were not so extensively used. This adds up to an annual transcription page requirement of 90,000. The $217,503 in annual transcription costs in Exhibit 4 then averages to $2.42 a page.

[5/] Sum of $152,100 transcription clerk costs and $48,842 in-court clerk costs allocated to transcription.

The Cost of Manual Reporting: It is useful to compare the above costs to what they would have been if manual court reporting had been used. At first glance it would seem that we would have needed to replace the 21 in-court clerks with court reporters. But the National Center for State Courts has stated that most often both reporters and in-court clerks are used in state courtroom proceedings where the record is manually prepared.[6/] Therefore, the ensuing analysis will deal with two alternatives - one where the court reporter replaces the in-court clerk and the other where the court reporter is used in addition to the in-court clerk.

Court reporters in the U. S. District Court in Alaska draw an average salary of $25,236 a year in addition to a non-taxable 25 percent cost-of-living allowance which would be $6,309 for a total annual salary of $31,545.[7/] We would have to replace our 21 in-court clerks with 21 reporters whose combined salary would be $662,445. Since court reporters would be state employees, fringe benefits at 30 percent would raise annual personnel costs for the 21 reporters to $861,178.

[6/] June 5, 1978 Memorandum from Michael Greenword of the National Center for State Courts to the Administrative Director of the Alaska Court System.

[7/] This is a conservative figure since it does not take into consideration the taxes not paid for the $6,309 cost-of-living allowance. Reporters working for the state would have to pay such taxes.

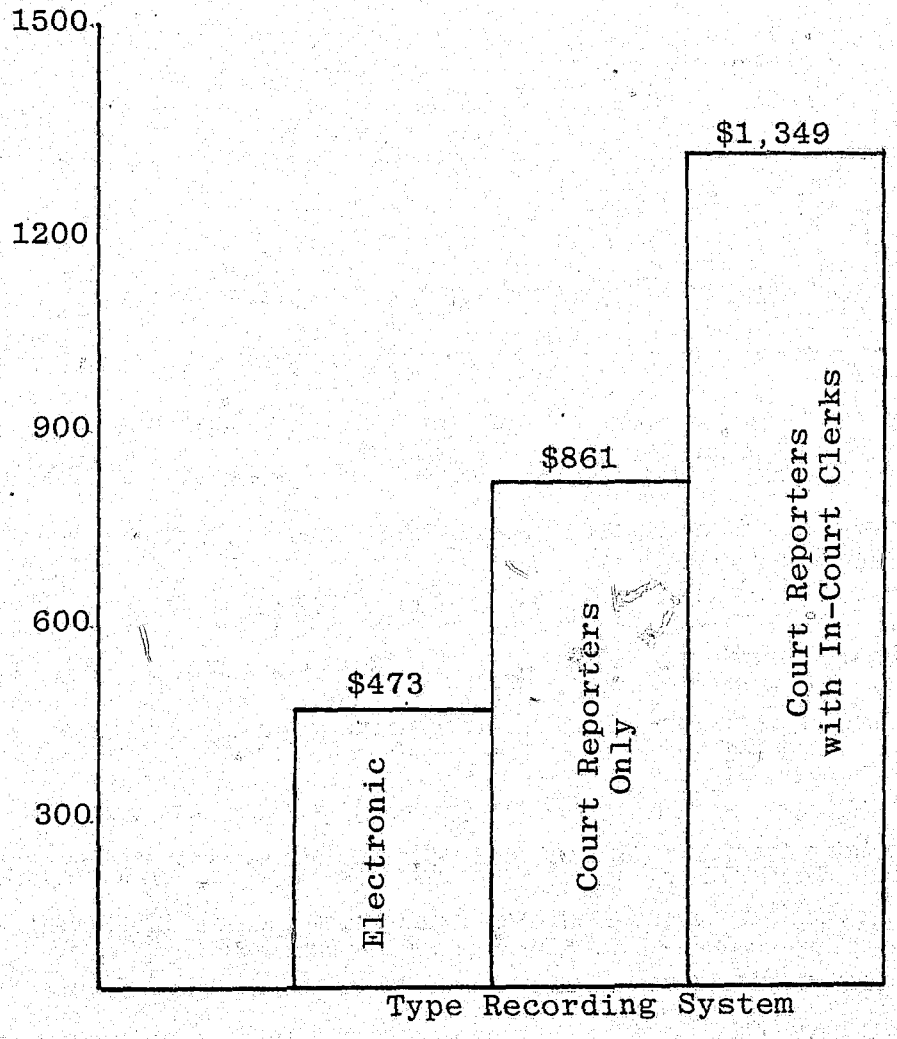
It is assumed that the ten percent of the time in-court clerks devoted to transcription would be assumed by the court reporters. Therefore, the entire total of Exhibit 1, or $488,420, would apply in the case where both court reporters and in-court clerks were used. In this case, then, total annual costs of manual recording of the record would be $1,349,598. The costs of both modes of manual recording of the record are compared with electronic recording of the record in Exhibit 6. Manual preparation of the courtroom record would have cost the state at least $387,881 more than electronic recording. If in-court clerks were augmented rather than replaced (the more common occurrence), the costs to the state would have been $876,095 more for manual preparation of the record.

As to transcription costs, price per page set by court rule is $2.00.[8/] There is no reason to assume that state court reporters would charge any less. At 90,000 pages a year (cassettes would no longer be possible), this would mean an annual cost to the state of $180,000, or $37,503 less than current transcription costs.

[8/] In reality it is $2.75 per page since one copy at $.75 is always provided since the original copy must be filed with the court. For the sake of simplicity, we will only consider cost of the original.

EXHIBIT 6

Costs of Recording Systems



Total costs of electronic versus manual court reporting are shown in Exhibit 7 which illustrates the great cost advantages of electronic over manual court reporting.

Exhibit 7
Costs of Electronic Versus Manual
Court Reporting

	Type Reporting		
		Manual	
	Electronic	Without In-Court Clerks	With In-Court Clerks
Preparation of Record	$473,297	$861,178	$1,349,598
Transcription	217,503	180,000	180,000
Total	$690,800	$1,041,178	$1,529,598

Finally, it is uncertain what the cost per page may be for recently developed computer assisted transcription systems. But a close look at Exhibit 7 will show that, if such prepared pages were provided free to the state, manual court reporting would still be more expensive than electronic court reporting.

Other Considerations: There are three other considerations that, while not included in the above analysis, make the cost advantage of electronic court reporting even greater. The first is that of sound reenforcement. A great number of courtrooms in this country require microphones and speakers so all parties can be heard. (A mumbling witness must be heard by the members of the jury as well as the court reporter). Such sound reenforcement is not linked

to whether or not electronic court reporting is used but, when there is electronic recording, the costs of sound reenforcement are reduced. This is because some of the equipment required for electronic recording is also required for sound reenforcement. The obvious example is microphones. Thus a portion of the costs of equipment attributed to electronic recording above could correctly have been prorated to sound reenforcement instead.

A second factor is that electronic storage of words is cheaper and takes less space than does storage of paper words. While microfilming will decrease paper space requirements, it will also add to the cost. The cost advantages of electronic recording in records retention will become greater as media including video recording and video disk continue decreasing in cost while paper increases in cost.[9/]

The third factor is that the cost gap between electronic and manual court reporting will likely increase in time. If inflation creates a ten percent increase per year in both the costs of electronic and manual court reporting, then the cost gap between them will also increase ten percent a year. But it is doubtful that both types of reporting will have costs increase at the same rate. Electronic court reporting's costs are partially equipment oriented while the costs of manual court reporting are totally personnel oriented. Equipment costs have historically risen at a

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[9/]While these technologies are labelled 'video', they also have audio storage capabilities.

much lower rate than have personnel costs. This fact will tend to make the cost advantage of electronic court reporting become greater than otherwise.

IV. Quality of the Record

A 1971 article in the American Bar Association Journal states:

> "An examination of more than 1,000 pages of transcripts produced in Alaska shows that the quality is so poor that it would not be acceptable in most courts in the United States. The incidence of 'inaudible' or 'indiscernible' notations is so numerous as to make questionable the value of any such transcript. Live court reporters produce far superior transcripts at little more cost to litigants and at less cost to the taxpayers."[10]

Quite a different picture is painted by Robert H. Reynolds, a former administrative director of the Alaska Court System. Commenting on the "....numerous instances where local attorneys and others from outside Alaska [had] employed shorthand reporters to record proceedings concurrently with the Alaska Court System's equipment," Mr. Reynolds describes the results of such 'tests' as follows:

> "Subsequent comparison of the respective products removed any doubts as to the high quality of the court system transcripts. On each such occasion where stenographic transcripts were available they were edited against the court's electronic tapes of the proceedings. The results were nothing short of unbelievable--

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[10] Edgar Paul Boyko, "The Case Against Electronic Courtroom Reporting" (#57 American Bar Association Journal 1608 (1971)).

> so much so that the author was not satisfied with the 'hearsay' reports, but had to satisfy himself with the personal replay of the tapes while reading the shorthand produced copy. Hundreds of pages of transcript prepared by various 'certified' and 'official' reporters, so edited, revealed frequent instances of what we now feel are characteristic errors of the manual method: (1) editing of grammar and sentence construction; (2) omissions of questions and answers by reporters who apparently take it upon themselves to judge what is relevant or irrelevant; (3) failing to correctly hear and transcribe certain words, which may sometimes be critical to the meaning of testimony; and (4) interpretive narration of testimony given too rapidly for verbatim transcription."[11]

It is difficult to believe that both authors were speaking of the same system.

Quality of the record is a two-faceted issue. The first is that of recording an exact replica of what has occurred in the courtroom - a replica unmodified by judgment or expediency. It is largely to this aspect of quality that Mr. Reynolds speaks. Many parties to the justice system believe that it is better to have a word or phrase be "indiscernible" (not understood) on an electronic record than to have it replaced on a manual record with a word or phrase that changes the meaning or the flavor of testimony.

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[11] Reynolds, Electronic Reporting

Another important point surfaces from Mr. Reynolds' statement. The editing of grammar, omission of questions, failure to hear certain words, and interpretive narrations found in court reporters' transcripts would never have been known to exist had not electronic recording equipment been in the courtroom. The record would have been what the court reporter said it was, rather than what it really was. If parties in a case disagreed with the reporter's version of the proceeding, there would have been no place to look to resolve the disagreement unless the proceeding had also been recorded. This may have been why electronic recording equipment was used as a backup for court reporters during territorial days. But if electronic recording is to be used as the "ultimate authority", why then a redundant and costly manual system?

The second facet of quality of the record deals with the rate that indiscernibles appear in a typed copy of the proceeding. If the quality of the electronic record is poor, the transcriber will not be able to identify (hear properly) many words or phrases of the testimony. He or she will then be forced to type the word "indiscernible" in place of the actual testimony. Three years ago we implemented a "quality assurance form" (See Appendix G) to be filled out by the transcriber while he or she was listening to the electronic record. A copy of the completed form was sent to the applicable judge and in-court clerk for correction of recording problems. After 18 months the rate of "indiscernibles" proved to be less than one in every 100 pages. The continued use of the form was stopped. It is now used on a

periodic, sampling basis. Whatever standard one may establish for acceptable quality of an electronic record, it is clear that Alaska's electronic court records are of high quality. Certainly this data describes a situation quite different from that posited by Mr. Boyko. But partially in his defense, his statements were made in 1971 - the era of the soundscriber. Our data was taken in 1976 and 1977 - the era of the more modern Akai.

Indeed the quality of record today is so good that much of the proofing previously done in transcription sections has been eliminated. It used to be common procedure that, after the transcriber had prepared his or her transcript and scanned it for obvious typing errors, the transcript supervisor or another transcription clerk would put on the headsets, listen to the same tape, and check each typed word against the electronic record. The rate of errors on typed transcripts was found to be so low in quantity and quality that this redundant proofing operation was proved unnecessary. It was therefore discontinued.

However, there is an additional price to pay for such quality other than the moderate costs of equipment. The courtroom must be controlled to make an effective record. And it is the ultimate responsibility of the judge to ensure such courtroom control which includes:

(1) restraining the "wandering advocate" from abandoning his or her microphone(s);

(2) counseling parties against talking at the same time (the electronic recorder can make more sense out of simultaneous orations than its human counterpart because of its ability to play back only one track (one microphone) at a time, but this still can be a problem).

(3) quickly cautioning a witness when his or her voice is not loud or clear enough to be heard (and does not record).

The judge must take an active role in the preparation of a proper record in an electronic court reporting system.

Finally, another quality problem often referred to in the first ten years of Alaska's experience was that of having a proceeding apparently be recorded only to subsequently find that the equipment had malfunctioned or had not been turned on. With the courtroom monitoring capabilities of our current equipment, this problem no longer exists.

In summary, while quality of the electronic record may have presented some problems in the past, this is not the case today. Indeed, it seems clear that today's equipment's quality, combined with its inability to interpret, edit or omit testimony, allows it to produce a record superior to that which could be produced manually by a court reporter.

V. Other Considerations

Personnel Turnover: It has been occasionally stated that retention of qualified in-court clerks and transcribers has been a problem with electronic court reporting in Alaska. While employee turnover in Alaska is a generalized problem, we have not found it to be one we cannot control for in-court clerks and transcribers. In-court clerks are generally promoted from within the court system and enter their jobs with some knowledge of the courts. Training on the equipment is quick, easy and effective. Such training is conducted by other in-court clerks and by technicians from the statewide Electronic Recording Maintenance section. This section has also developed training films and manuals. While we still find that operator errors exceed machine malfunctions at a ratio of about two to one, the incidence of both types of error is relatively infrequent.

Turnover of transcribers was a far greater problem in the first ten years of our experience than it is today. But commercial transcription, once almost non-existent, is now present in Anchorage and Fairbanks to a sufficient degree that there is an adequate job market for qualified transcribers. This, coupled with the adequate pay and fine fringe benefits available for state employees, has made turnover and availability of transcribers a lesser problem than it once was. If the problem were to heighten, the option of using commercial services to a greater degree than we do now would still be open.

The salient point, however, is that there is no evidence that whatever turnover, sickness or other personnel problems

which might be encountered with in-court clerks and transcribers would be lessened with court reporters. Given the greater experience generally accredited to court reporters, availability and training of court reporter replacements might well make their turnover more of a problem than that of in-court clerks and transcribers.

Response Time for Copy of the Record: A frequently cited advantage of the court reporter over electronic reporting is the ability of the reporter to more quickly produce a paper copy of the record. While at least one study has led this contention to be suspect[12], the point becomes relatively unimportant when we note that less than five percent of taped records have to be transcribed to paper, and many of these transcriptions are not "same-day". In addition, many "same-day" requests (e.g., grand jury hearings) are produced on cassette rather than paper.

Further, it is common practice in Alaska for attorneys and judges to listen to the electronic record of a proceeding or to request a cassette rather than a paper copy. And while it is not yet common practice in this state, we have personal knowledge of one appellate judge in New Mexico who hears appeals on the electronic record rather than requesting paper copies.[13]

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[12] James E. Arnold, "A Study of Court Reporting" (Sacramento, California-November 1973).

[13] A rule is under development where, for certain types of "emergency" matters, the electronic record will be sent to and heard by the Alaska Supreme Court in lieu of producing a typed transcript.

Finally, the electronic record seems to have an advantage when it comes to playback of a part of the proceedings for juries. While the court reporter in a manual system can read aloud his or her notes as playback, those notes lack the voice inflections which electronic records can provide.

Thus the issue of rapid turnaround of a typed record becomes largely moot under the Alaska system. Rapid turnaround is rarely required and, when it is, the turnaround can often be performed more quickly and effectively by electronic rather than typing means.

Log Notes: In-court clerks must maintain log notes to keep track of where on the record different parties speak and what is the essence of their oration (See Appendix H). These log notes are used to later designate which part of the electronic record is to be listened to or transcribed. The log notes contain the date of the proceeding, the type of proceeding, the judge, and how much bench time the proceeding takes. This information has proved extremely useful in developing judicial resource indicators.

In recent years, several state court systems have implemented case weighting systems for determining judicial position requirements. These approaches measure how many bench hours are required to hear different types of proceedings, how many bench hours are available per judge, and, by dividing the second figure into the first, how many judicial positions are required.

Alaska has used a case-weighting system since 1975. While other jurisdictions must implement expensive, onerous, and disruptive surveys of what is happening in their courtrooms, the log

notes required for electronic recording provide our system with all requisite case-weighting data on a non-obtrusive, consistent basis. While this nice-to-have, analytical tool certainly does not justify an electronic court-reporting system, it is a valuable spinoff.

VI. The Future

Since our recording units were purchased in 1973, they are quite a few years behind the "state of the art." Among currently available features not existent on our Akai recorders are (1) full automatic volume control option; (2) electronic logging; (3) automatic search for specific portions of the tape record; (4) easily resetable tape counter; and (5) simple panel control layout (only five or six knobs, switches and buttons).

However, these features will be incorporated into newly purchased Akai units and into existing units over the next several years in conjunction with minor mechanical overhauls. These modifications will be facilitated by the recent purchase of a microprocessor development tool. This tool is primarily a computer using a programming language to design an electrical modification and an interface to convert this design to an electronic chip to be placed on the recording equipment. Modification of the Akai units will increase their serviceable life by at least five years.

It soon becomes clear to one entering the electronic court reporting environment that one's focus must be extended many years into the future. Explosive technologies make this a must. To stress this point, the following ideas of what electronic courtrooms may look like in the future are presented. These ideas are based upon predictions found in current electronic journals.

The 1984 courtroom will have a central recording unit which

uses a cassette tape media for audio storage. It will have six channels for recording in addition to one for the text of the log notes. This system will record some 500 hours of proceedings per cassette. Wireless microphones using infra-red light will be installed.

1989 electronic court reporting equipment will have an additional four channels of recording capability. Digital processing on the audio channels will eliminate background noise and focus on particular courtroom participants during playback. There will be no controls on the main recorder - it will operate automatically. Recording time will have doubled to 1000 hours.

By 1994, a transcript channel will have been added which will allow automatic printing of a hard copy of the record if desired. The system will automatically prompt participants to speak up or repeat transmissions. This prompting will be done via a display of what is being recorded on a terminal located in the courtroom.

As one looks at projected technological advances of electronic recording in the near future, it becomes clear that, for most if not all court jurisdictions in this country, electronic court reporting becomes a question of "when" rather than "if".

VII Conclusions

The Alaska Court System embarked on the total statewide use of electronic court reporting almost 20 years ago. While the decision to use this method of reporting was probably unavoidable for this state, it might have been unwise for other jurisdictions due to the relatively primitive nature of the recording art at that time. But now recording technologies have caught up with, indeed surpassed us. Today the quality of the electronic record is outstanding and the inability of the machine to modify what occurs in the courtroom makes it a more reliable recorder. Secondly, but importantly, electronic court reporting costs less than its manual counterpart.

APPENDIX A

Alaska Court System Administrative Rule 47

Rule 47. Electronic Recording Equipment—Official Court Record—Responsibility for Record.

(a) Electronic recording equipment shall be installed in all courts for the purpose of recording all proceedings required by rule or law to be recorded. Such electronic recordings shall constitute the official court record. It shall be the responsibility of each judge or magistrate to require that the electronic recording equipment in his court be operated only by qualified personnel in such manner and under such conditions as to insure the production of a readable record of all proceedings.

(b) Before commencing any proceedings required to be recorded the judge shall satisfy himself that the electronic recording equipment is functioning properly and during all proceedings shall require the clerk or deputy clerk to supervise the operation of and constantly monitor the input to the equipment and immediately notify him when the quality of the recording is doubtful. Where extraneous noises, interference, poor enunciation or other factors create doubt that the electronic record is sufficiently clear to permit full transcription, it shall be the responsibility of the judge to cause the doubtful proceeding to be repeated.

(c) The courtroom clerk or deputy clerk shall be responsible for maintaining a detailed, accurate and thoroughly legible written record of all proceedings recorded on each magnetic tape. The maintenance of such record shall be according to instructions of the administrative director of courts.

(d) The administrative director of courts shall issue specific instructions to court personnel regarding proper monitoring and transcription and providing for a uniform safe method of permanent preservation of magnetic tapes and logs.

(e) The administrative director may authorize the use of video tape equipment to record any trial where the recordation of such proceedings is feasible. The video tape will constitute the official court record. (Amended by Supreme Court Order 114 effective October 14, 1970; by Supreme Court Order 134 effective immediately; and by Supreme Court Order 198 effective February 15, 1975)

APPENDIX B

Radio Frequency Interference (RFI)

Record quality can be impaired by interference from radio frequency. Sources of such energy can be light dimmers, motors, automobiles, citizen-band radios, television stations, and police radios. The interference can be heard as the actual material transmitted (e.g., voices) or more commonly as a 60 to 120 cycles per second buzz. Interference can be present both during recording or playing back of the record and will change with proximity to the interfering object.

The best way to solve RFI is to prevent it from occurring in the first place. This can be done by checking out the equipment before leasing or purchasing it. Because relatively few units sold by the manufacturer are used in RFI prone areas, manufacturers probably are not as careful as they could be about shielding against RFI.

If equipment already purchased has RFI problems, our experience has shown that line filters are of little help. In addition, capacitors soldered across the input usually tune the circuit rather than filter it. We have found that the best solutions to eliminating or reducing RFI are to install low impedence, balanced microphones; try repositioning the cords or equipment until the RFI is tolerable; or find a qualified technician who can properly shield your equipment.

APPENDIX C

Equipment Selection Criteria

1. Immunity from RFI: Does the unit pick up unwanted signals which can degrade record quality? (There are two areas in the Anchorage court building that are prone to RFI. We test new units out in these areas.)

2. Six Hour Tapes: Can the unit handle the 0.5 mil tapes necessary to record six hours on a seven inch reel? Will the transport damage the tape?

3. Counter: Does the unit have a logging device which allows easy and repeatable search and return to a known location on the tape? Does the logging device correlate to the ones we currently use? Is there a manufacturer's option to correlate their logging device to ours?

4. Systems Compatability: Would we need to change connectors and cables or add mixers? What would be the impact of mixing this equipment with the type currently used as far as affecting in-court clerks' ability to troubleshoot and exchange faulty boxes? Would there be any media format problems in using tapes between courts with different equipment?

5. Physical Size: Will the unit require rework of benches and portable carts to retain visibility and bench space?

6. Brown Out: Will the unit operate at reduced line voltages? At 85VAC?

7. Control Similarity: Are the controls well laid out? Are they similar to existing controls? Are they ambiguous?

8. Delayed Monitor: Can the in-court clerk monitor that which was just recorded?

9. Sound Quality: Is the quality of sound acceptable?

10. Multichannel: Are there at least four discrete channels which may be isolated during playback?

11. Transcribing Cycle: Will the unit operate in the "play" and "rewind" modes for hours without malfunction or overheating?

12. Initial Cost: What is the cost of the unit in the configuration we would use?

13. Modification: What modifications will be necessary for the unit to be usable to us? What is the cost of these modifications?

14. Channel Indicator: Is there an indicator for each channel?

15. Overrecord Protection: Can the record be obliterated by over-recording?

16. Manufacturer Service: Is service of system-wide problems readily available? What experience have we had with this manufacturer in the past?

17. Noise: Is the unit noisy in operation?

Attached is a simulated criteria worksheet.

CRITERIA WORKSHEET

UNIT: Simulate XYZ Conference Reporter

TEST DATE: 10/17/78

1.	R.F.I. immunity	-	poor with supplied microphones, fine with ours
2.	6 hour tapes	-	does not apply as the recording is continuous
3.	Counter	-	no correlation with present
4.	Systems Compatibility	-	It would require additional mixers.
5.	Physical size	-	Volume is smaller than that of AKAI, but counter space is more than double.
6.	Brown out	-	no test
7.	Control similarity	-	Controls are kind of ambiguous with two stop controls - I imagine people would adapt with time.
8.	Delayed monitor	-	yes
9.	Sound quality	-	not nearly as good as AKAI units
10.	Multi channel	-	yes
11.	Transcribing cycle	-	OK
12.	Initial cost	-	about $3,000
13.	Modifications	-	None to unit - It would cost about $300 per location for modification to courtroom.
14.	Channel Indicator	-	no
15.	Overrecord Protection	-	yes
16.	Manufacturer Service	-	Average availability-problems with manufacturer in past.
17.	Noise	-	no

APPENDIX D

Sound Reenforcement

A sound reenforcement system in a courtroom is essentially a public address system, but one in which it is not obvious to the speaker that he or she is being broadcast. We have found sound reenforcement to be helpful in all but the smallest hearing rooms. Our systems consist of the following equipment:

3 microphones @ $70	$210
3 feedback controllers @ $87	261
1 mixer @ $87	87
1 power amplifier @ $50	50
2 speakers @ $60	120
Total	$728

It is important to note that the microphones, amplifiers and speakers are used for electronic recording.* Thus our added cost for sound reenforcement is only $348 per courtroom.

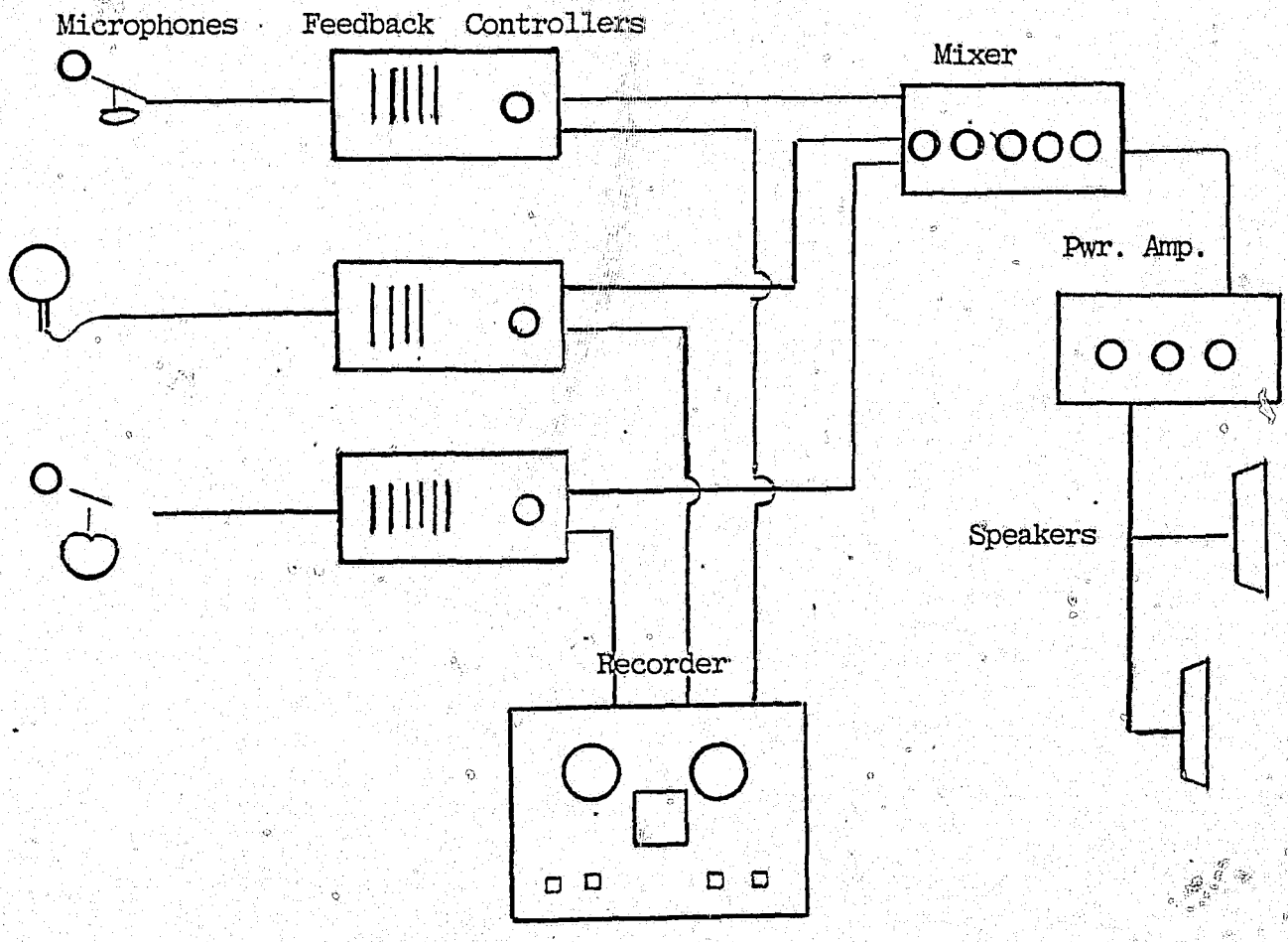
A better approach to sound reenforcement is the use of an automatic mixer. This unit was not available in 1974 when we reenforced our courtrooms for sound. We are planning to install these in newly constructed courtrooms and to modify existing courtrooms when the opportunity arises.

The in-court clerk has setting control for individual microphones and this has presented no problem to us. The use of a lavilier (lapel) microphone in the witness box helps both the record and the sound reenforcement system. Attached is a schematic of our sound reenforcement system.

*Speakers are used in our electronic recording system for playback of the record in the courtroom.

SCHEMATIC OF COURTROOM

SOUND REENFORCEMENT SYSTEM



APPENDIX E

Wireless Microphones

A wireless microphone has no wire connecting it to the recorder or mixer. The wireless microphone typically uses radio waves as the transmission media. We experimented with their use and found them to be more trouble than they were worth. One of the problems probably was our use of relatively cheap units ($650 each). We might have had more success with more expensive wireless microphones, but we would have had to more than double our investment. Another problem we encountered was the need to "baby sit" the wireless system. There are many idiosyncracies with wireless microphones such as battery voltages and antenna placement that make it almost impossible for the in-court clerk to handle. In addition, we had the problem of selecting a frequency that no one else was using. Thus we had to have a technician standing by.

However, when the wireless microphones worked, the quality of the record was phenomenal. We look for some manufacturer in the next few years to develop a wireless microphone that will overcome these problems. However, we still have concerns that the investment that will be required may be too high.

APPENDIX F

Courtroom Construction for Electronic Recording

The following factors (listed in order of importance) must be considered in construction or modification of a courtroom for electronic recording and sound reenforcement.

1. Ambient Noise Level: This measures the noise level in the courtroom. The quieter the room the better is the record and the more the room costs. There is a specification called Preferred Noise Criteria (PNC) that measures the ambient noise level. (See attached graph of PNC curves.) We usually request the contractor to build PNC 25 courtrooms, but the end result is generally PNC 35-40 in most courtrooms. Some of the things which affect ambient noise levels are heating and lighting noise, plumbing, elevators, aircraft and cars, and foot traffic in the hallway. Contractors can usually help to reduce noise levels with minimal expense during construction. Therefore, we send detailed specifications to the architect and contractor when new courtrooms are being constructed or old ones modified.

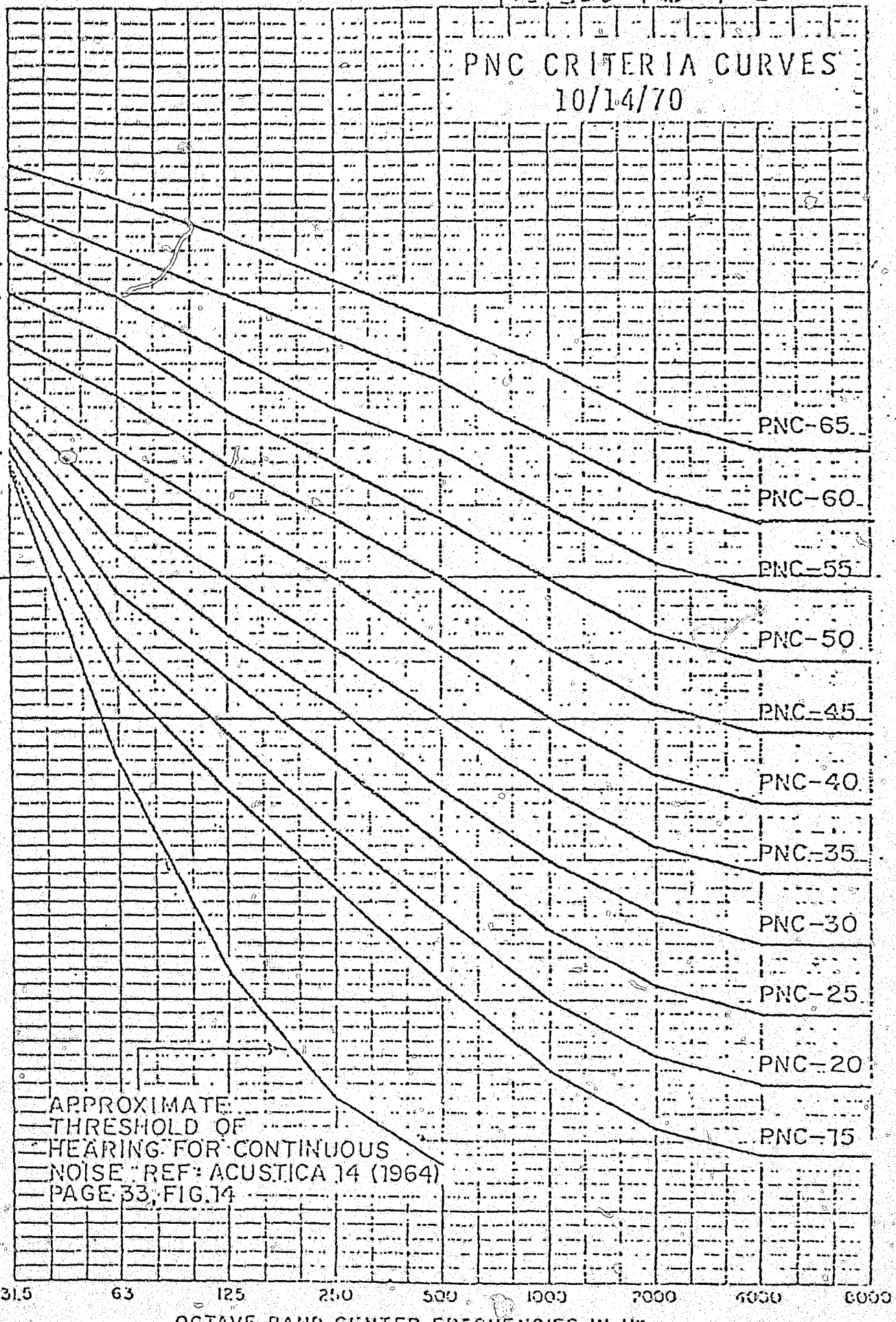
2. Physical Placement: Our specifications also include placement of microphones, the courtroom phone, security system, bench locations and proper areas for the judge, clerk and witnesses. Attached is a standard plan we use for the construction of small courtrooms.

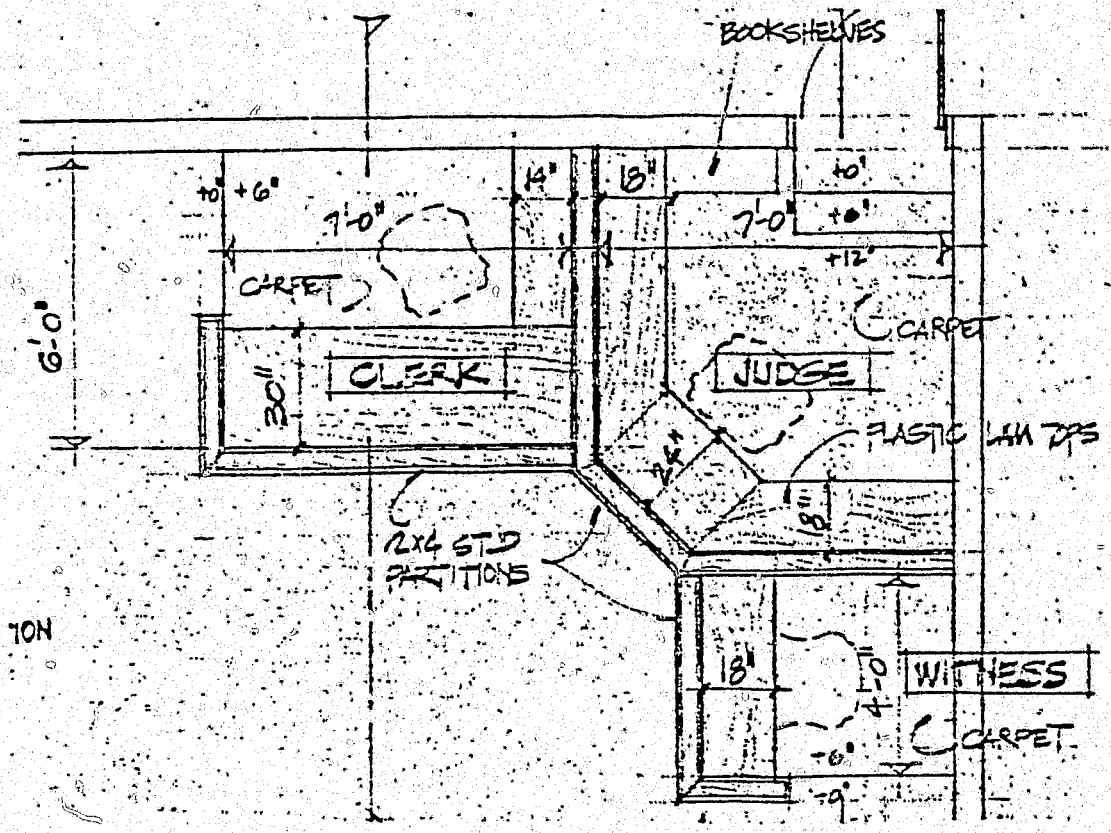
3. Reverberation Time and Flutter: This refers to how hollow or dead the room sounds. We adjust the reverberation time to just above that recommended for recording and broadcasting studios on the attached graph.

   Flutter is prevented by ensuring that opposite walls are not parallel or, more commonly, by ensuring that opposite walls are not accoustically "hard".

BOLT BERANEK & NEWMAN INC

Project No. 106231




BOOKSHELVES
14"
18"
+0"
+6"
7'-0"
7'-0"
+0'
+12"
CARPET
CARPET
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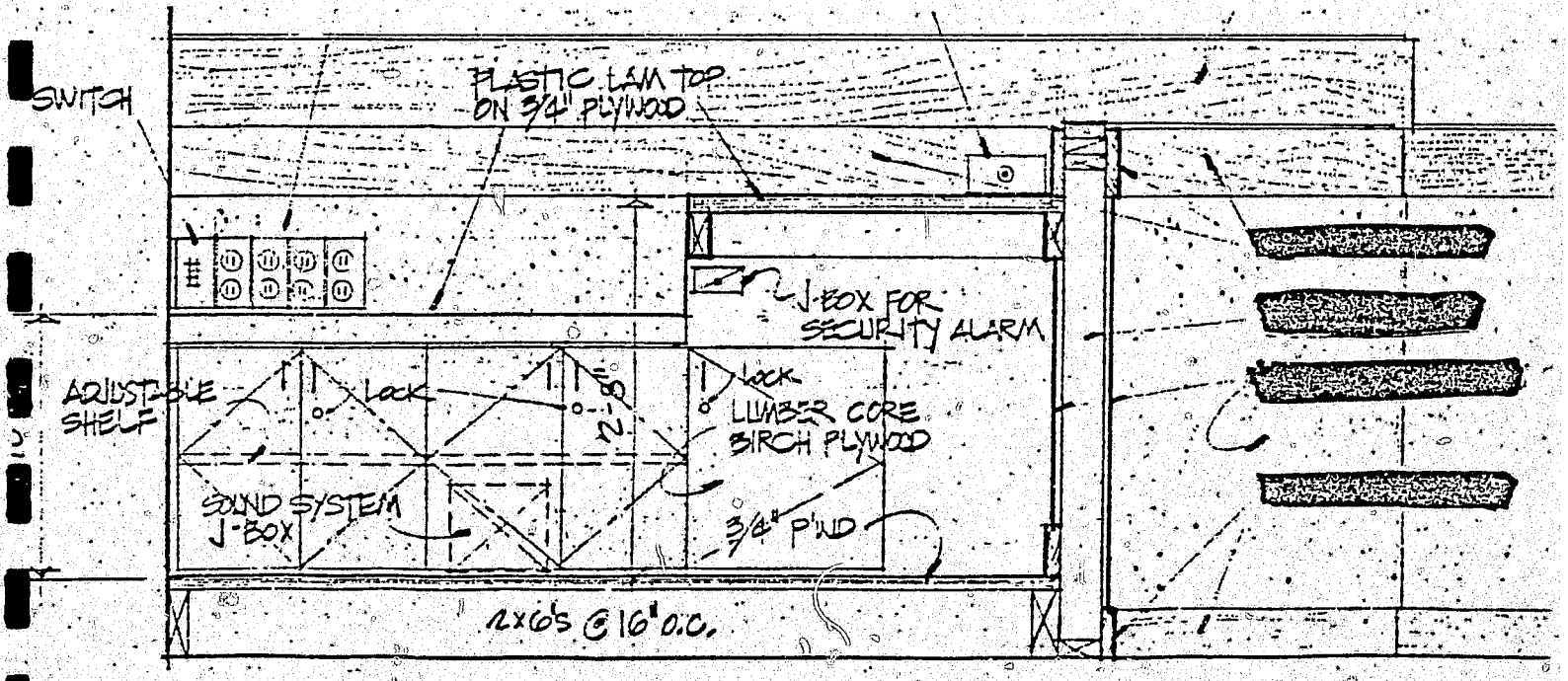
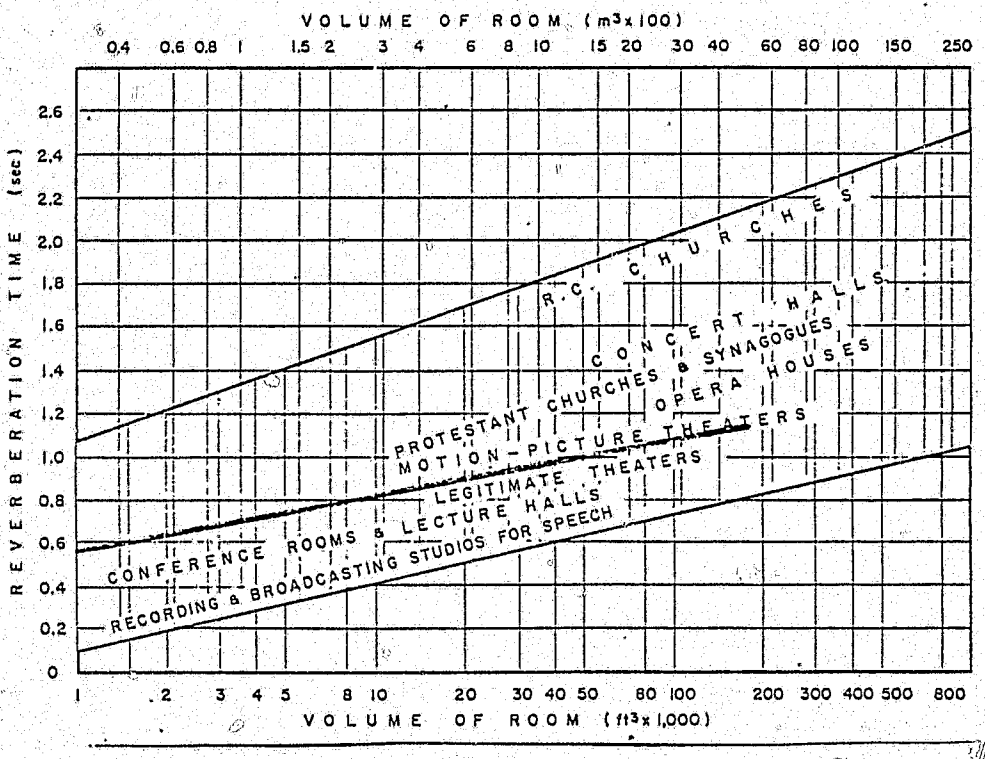
18"
WITNESS
CARPET
+6"
+9"


SWITCH
PLASTIC LAM TOP ON 3/4" PLYWOOD
J-BOX FOR SECURITY ALARM
ADJUSTABLE SHELF
Lock
Lock
LUMBER CORE BIRCH PLYWOOD
SOUND SYSTEM J-BOX
3/4" PLYWD
2x6's @ 16" O.C.

#A.


VOLUME OF ROOM (m3x100)
0.4 0.6 0.8 1 1.5 2 3 4 6 8 10 15 20 30 40 60 80 100 150 250
REVERBERATION TIME (sec)
2.6 2.4 2.2 2.0 1.8 1.6 1.4 1.2 1.0 0.8 0.6 0.4 0.2 0
R.C. CHURCHES
CONCERT HALLS
PROTESTANT CHURCHES & SYNAGOGUES
MOTION-PICTURE THEATERS
OPERA HOUSES
LEGITIMATE THEATERS
CONFERENCE ROOMS & LECTURE HALLS
RECORDING & BROADCASTING STUDIOS FOR SPEECH
1 2 3 4 5 8 10 20 30 40 50 80 100 200 300 400 500 800
VOLUME OF ROOM (ft3x1,000)

APPENDIX G

Quality Control of the Record

One must first decide what quality level is acceptable for the record. A common measure of quality of the court record is the number of indiscernibles per 100 pages of typed transcript. We have never established a standard for this measure, but our rate of less than one indiscernible per 100 pages has satisfied us that the quality of our electronic record is more than adequate. Our measurement of quality is done at the time of transcription of the record by the transcription clerk (See the attached checklist). As explained in the body of this paper, the relative number of indiscernibles became so low that we found little value in continuing our monitoring system on a continuous basis. We now rely on oral feedback from our transcribers and the users of our transcripts. We plan to reimplement this quality control approach on a periodic basis to ensure that quality does not decay.

Some of the factors which we have found to degrade quality of the record include:

1. failure to perform a daily courtroom test of the equipment,
2. high ambient noise in the recording area, (See Appendix F),
3. high reverberation time in the recording area (See Appendix F),
4. microphone not proximate to speakers,

5. poor courtroom control of speakers, and

6. lack of a regular training program for in-court clerks.

By the establishment of a formal training program, by emphasizing the role of the judge in effective courtroom recordings, and by establishing an in-house equipment maintenance and training program, we have been able to maintain our records at a high quality level.

We concentrate our quality control feedback at the point when the record is transcribed. Since something less than five percent of court proceedings are ever transcribed, this might be considered quality control using a five percent sample. This sampling approach allows us to test quality without hearing all the records at all 70 locations. The feedback necessary to adjust faulty equipment on a timely basis is the in-court clerks daily test of the recording equipment.

TRANSCRIPT RECORD EVALUATION

Case Name_____
Date_____
Date of Recording_____
Number of Pages_____

Court Room #_____
Incourt Clerk_____
Tape_____
Proofer_____

GENERAL QUALITY	(circle one) good poor	if poor why:	
EASE OF TRANSCRIBING	(circle) good poor	if poor why:	
NUMBER OF INDISERNIBLES FROM:	Judge	#	why:
	Counsel for Defendant		why:
	Counsel for Plaintiff		why:
	Witness		why & who
total_____	Jury		why:

WHO WAS HARD TO UNDERSTAND AND WHY (CHECK)	Judge	why:
	Counsel for Defense	why:
	Counsel for Plaintiff	why:
	Witness	why:
	Jury	why:

APPENDIX H

Log Notes

IN THE _____ COURT AT _____ ALASKA _____

TAPE NO. _____ PAGE NO. _____ COURT CONVENED AT _____ A.M. ☐ P.M. ☐ DATE _____ 19__

PRESENT: JUDGE _____ CLERK _____

CASE NO. _____ CASE TITLE: _____ VS. _____

PROCEEDINGS: _____

COUNSEL PRESENT: PLAINTIFF _____

DEFENDANT: _____

DEFENDANT ☐ PRESENT ☐ NOT PRESENT ☐ IN CUSTODY ☐ NOT IN CUSTODY

LOG NUMBER	DESCRIPTION

CLERK NOTES

END