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EDITORIAL (U)

It is sometimes puzzling why some people turn out to be good at this analysis business, while others who are evidently just as well educated never seem to get the knack of it. I have, of course, some theories about this (or I wouldn't have brought the subject up), and I wonder what you the readers think about this.

One notion I keep coming back to, is that very few discoveries are ever made by means of the so-called "scientific method", and that it is only when one comes to the point of having to describe the discovery to others that the "scientific method" is used, as an orderly way of laying out facts and their connecting arguments.

Over the years, it seems to me that the great bulk of the genuine analytic discoveries were made by a relatively few people. Some of these people, perhaps most, were not really "scientific method" people. If they had a "method" there was often a faint smell of magic about their description of it. Sometimes, they would describe their discovery as an accident, as pure serendipity.

I no longer believe in the serendipity explanation. It simply doesn't fit the circumstances. The accidents should have happened to a larger number of people, not just to a small number of "serendipity-prone" analysts. I think it has to do with the way these people looked at the world, the way they perceived events around them.

Based upon my contact with a few of them, I believe that some of these serendipity-prones looked at the world around them in terms of

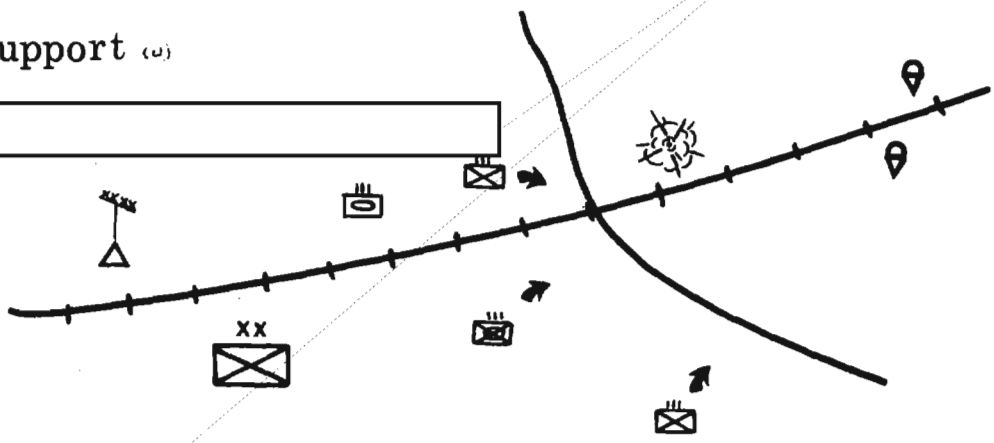
- a before,
- an after, and
- the event connecting them.

Given a certain "before" and "after" that were not the same, something "happened" at the connecting event. I think it may have been this way of looking at the events around them, that drew the attention of these serendipity-prones to the sites of their discoveries. Something did.

What do you think?

Exercise Support (U)

by [redacted]



(C-CCO) NSA/CSS, in accordance with USSID 4, supports U.S. military exercises where COMINT is required. V42 (Current Applications Division) levies personnel to serve as SIGINT Reporter/Analysts for the exercises. Since January, 1981, A6 (Technical Support) has participated in the program. The author would like to express his appreciation to Michael F. [redacted] Chief V421, for his comments on the section concerning the recent exercise.

Introduction to Exercise SIGINT (U)

(U) All large military exercises are conducted on the basis of a scenario depicting some imaginary war situation, both to give the participants experience in coping with situations not encountered in peacetime and to evaluate the capabilities of commanders, staffs, troops, systems, and equipment to cope with such situations.

(U) In the course of the exercise, participants are given preplanned information about imaginary events in the scenario - what the enemy is doing, what casualties friendly forces have suffered, etc. - and are expected to respond to these "events" with orders, plans, and actions. Exercise controllers then assess the results of the players' actions, give the players appropriate feedback through simulated intelligence and operational reports, and devise subsequent problems for the players.

(U) Because players' actions are often unpredictable, the course of events can deviate considerably from the original script. Controllers are expected to be able to handle this "free play" and still keep to the key themes of the scenario.

(U) Maximum realism is sought, but realism will always be sacrificed to accomplish exercise objectives. For example, enemy capabilities are adjusted as required to provide the desired amount of challenge to the players, even to the point of wild implausibility if necessary. The war cannot be allowed to be won or lost prematurely; desperate battles must continue right up to the end of the exercise.

(U) Chaos and confusion are unavoidable features of real warfare. These qualities are also characteristic in the management of intricate exercise scenarios. The planned breakdowns and disruptions designed to test the players are compounded by unplanned breakdowns and disruptions inevitably suffered among the controllers and referees.

[redacted]

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~~SECRET~~

A Recent Exercise (U)

(U) Upon notification of the JRX, Captain [redacted] of V421 (Exercise Support Branch) was designated NSA/CSS project officer. He attended the initial planning conference at REDCOM Hq (McDill AFB) where all of the intelligence players were brought together and the strategic scenario was given.

~~(C CCO)~~ CPT [redacted] then returned to NSA/CSS and began coordinating the SIGINT, personnel and logistic support for the exercise. Included in these support efforts were determining airlift requirements for NSA/CSS support personnel and arranging for accommodations and transportation at the exercise site. He also requested the necessary personnel support from A Group and communications support from DDT.

(U) The purpose of this JRX was to provide training for participating commanders, staffs and forces in joint air/ground operations involving air, armor, and mechanized forces.

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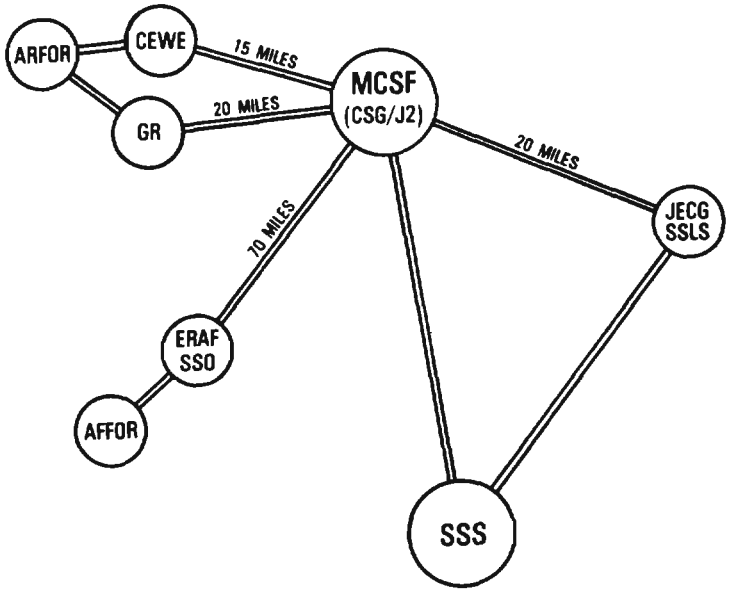
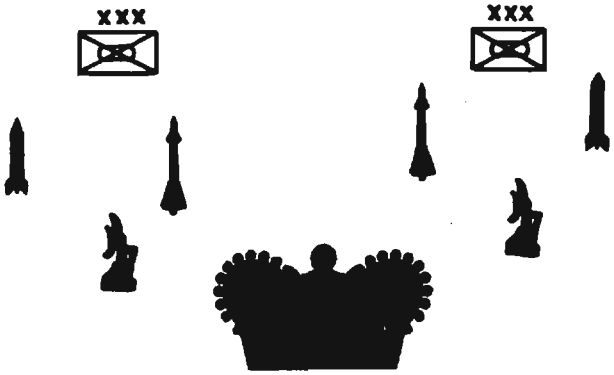
~~(S)~~ The exercise scenario depicted five



~~SECRET~~ ~~HANDLE VIA COMINT CHANNELS ONLY~~

~~(C-CCO)~~ The Joint Exercise Control Group (JECG) was the Exercise Controller, and as such interjected stimuli into the exercise to which the players responded. The SIGINT Support Liaison Staff (V421) was part of the JECG.



~~(C-CCO)~~ The Cryptologic Support Group (CSG) and Intelligence Directorate (J2) were co-located and were provided SIGINT inputs via the Mobile Cryptologic Support Facility (MCSF), which is a GM motor home that houses the most modern computer and communications equipment. The MCSF belong to NSA/CSS.

(U) The CSG is a group provided by NSA/CSS to facilitate SIGINT Support to a unified or specified command, joint task force commander or other commanders.

~~(C-CCO)~~ The Consolidated SIGINT Support

~~(C-CCO)~~ The SIGINT Support Staff (SSS) generated the SIGINT support for the exercise.

~~(C-CCO)~~ Upon conclusion of a JRX, a brief critique session is normally held; in the exercise from four to 20 people should have participated, but, in actuality, only the NSA/CSS personnel attended. P.L. 86-36

~~(S)~~ CPT said that the After Action Report which REDCOM would submit to the JCS would probably conclude that the JRX achieved its objectives primarily because logistics and air defense objectives were met.

~~(S)~~ CPT however, doubts the value of the exercise as a realistic simulation for the following reasons:

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(U) As to the success of SSS in support of the exercise, one can only conclude that exercise support objectives were partially met.

Transcriber Reactions
to Program Participation (U)

(U) Although the opinions varied among the transcribers participating in the various exercises, there were many areas of general agreement. Most of the transcribers thought the experience worthwhile in that they saw how the Agency fits into the SIGINT community, i.e., into "the big picture." Most thought they had gained from the experience, either professionally by a greater understanding of the SIGINT system and an increase in target knowledge, or financially by the overtime.

(U) At the time of A6's entry into the program, transcribers suffered from poorly organized pre-exercise briefings, little working aid familiarization, instructions that were wrong or incomplete or too rapidly given, and disorganized source materials. One transcriber noted that the standard was to be uninformed. The various staffs, however, are correcting these shortcomings on a continuing basis.

(U) Transcribers are left with a more complete view of current operations and a more complete understanding of the assorted and sanitized reports that exist in the intelligence community.

~~(C-CCO)~~ There was general agreement among the participating transcribers on two points:

- Exercise scenarios should be provided with sufficient time for perusal;
- Personnel should be carefully selected to insure that the individual has the proper background.

Otherwise, the individual may be inundated with a mass of incomprehensible data and given no time to decipher it. Some military knowledge is requisite.

The 1981 URSI XX General Assembly (U)

[redacted] recently attended the 1981 URSI Meeting, and his report offers some unsettling projections about the problems that SIGINT will face over the next one or two decades. This is an extract from the Introduction and Conclusions of that report.

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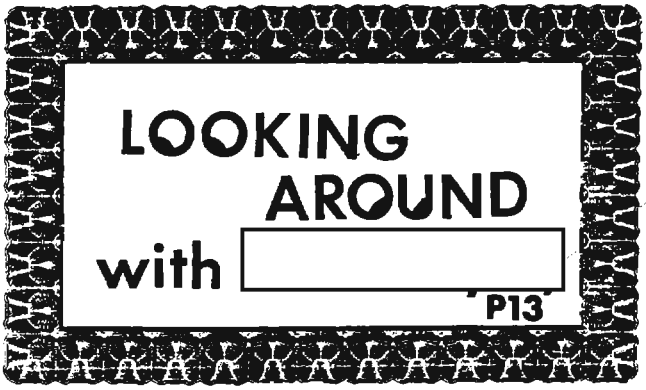

The 1981 URSI (International Radio Science Union) meeting was held in Washington, D.C. 10-19 August, 1981. The international meeting is held (U) every three years, and this was the first time in several decades that it occurred in the U.S.

(U) Because the meeting is prestigious, the authors and national radio science organizations make an effort to publish significant work. About 500 technical papers were given, covering almost every aspect of radio theory, including optical fiber, computer design, instrumentation, remote sensing, and biological effects of radio on humans, as well as the more conventional areas of propagation, noise, radio astronomy, microwave power, satellites, and telecommunications.

(U) The authorship, as well as the attendance, was very international. The meeting organizers reported that 1056 people registered, from 38 different countries. About half of the audience was from the USA. Japan, France, Germany, and the UK also had large contingents of 50 to 70 attendees. Six people came from the USSR, including some authors. 269 of the papers had foreign authors, although in some technical areas, nearly all the authors were from the USA.

~~(C-CCO)~~ There are some interesting parallels between SIGINT and radio science, viz:

1. Both activities deal with radio in a very broad way.
2. Both are concerned with quasi-repetitious phenomena, which they cannot control, as well as with unique or very random phenomena which give one-time capture opportunities.
3. Both have to develop unique apparatus and unique processes to obtain data and to extract information from these data, so they are both concerned with device engineering and measurement techniques.
4. The volumes and bandwidths of data are often very large, and the "explanations" tentative.

~~(C-CCO)~~ In general, the radio scientists [redacted] understanding the physical phenomena of radio, communications, and instrumentation. Their discoveries and measurements have, over many years, opened up new areas of the spectrum for radio applications, and improved instruments. They have also shown basic physical limitations to uses of radio, e.g., the effects of

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water vapor on short radio waves, air turbulence on laser beams, and the effects of noise on receiving systems.

~~(C-CCO)~~ The telecommunications planners and designers in many countries pay attention to the findings of radio science in the operation and particularly the development of their systems and equipment.

~~(S-CCO)~~ One thread of technical information from the URSI meeting will illustrate this point. Developments in optics have shown that great improvements in cost, performance, and lifespan of semiconductor lasers are possible, with lifetimes of 100,000 hours confidently predicted, and million hour lifetime thought possible. The fibers themselves are getting better with bandwidths of several GHz, and for certain new fibers, hundreds of GHz capacity are expected. From this progress, the CCITT (International Consultative Committee on Telephone and Telegraph) is now developing standards for worldwide compatibility between the parameters of all public carrier optical fibers, so the optical fiber nets can interface. According to a French consultant, the Europeans look upon satellites as a temporary measure for regional communications (TELECOM 1) and will shift all main line transmission to optical fiber links across Europe as fast as they can lay in the trunks, with the satellites reserved for mobile and other light services. At the same time, studies of the physical characteristics of optical components indicate to other Europeans researchers that the local networks cannot use optical fiber to carry 50 CATV signals in a bus, so they expect to go to a switched optical fiber network to replace the existing copper wire local plant with an individual fiber from a switch to each subscriber. This network would be expected to serve for 50 years after installation.

Analysis (U)

(U) Some of the major developments in communications have stemmed from advances in materials and the invention of devices. The electric telegraph of 150 years ago resulted from the purification of copper so that circuit losses were reduced to low enough levels to make generators, relay windings, and telegraph lines feasible. The semiconductor explosion came from improvements in the materials of semi-metals, and the current work in improving glass and optical devices seems to be setting the stage for a major revolution in switched communications.

(U) A recent survey of telecommunications in the Economist, 22 August 1981, notes the progress in optical fiber systems which surprised even AT&T and the BPO (British Post Office). Over the next decade, the world will spend 640 billion dollars on telecommunications equipment (according to an A. D. Little study), and radio will be a significant part of that. As optical fiber trunks take over the main line transmission loads, and even spread into the local networks, the radio frequencies will be applied to mobile radio, satellite service (expected to exceed 700,000 Intelsat circuits by 2000, plus even greater domestic satellite capacity), and many services where wires or light guides are impossible or impractical.

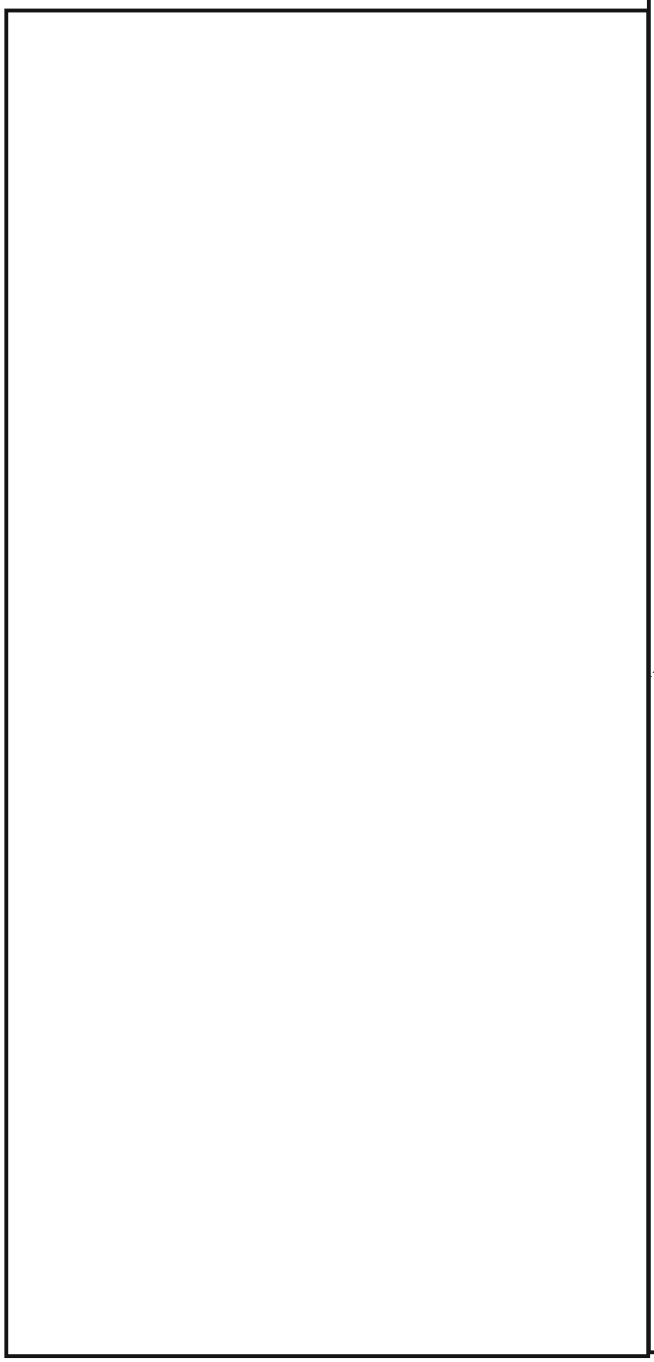
(U) One of the notable features of the URSI is the close interaction between devices, materials, and radio technology. Remote sensing depends on microcircuitry, super computers, models and devices to compensate for atmospheric distortion, propagation theory, antennas, and so on. Spread spectrum or radar signals to combat radio interference, noise or propagation effects depend on superspeed equalizing digital processors, electro-acoustic analog convolvers (waveform comparers), and high bit rate key generators, etc. Even efficient and accurate television transmission depends on sophicsticated signal processing technology, e.g., SAW PAL filters that are used in hundreds of thousands of TV receivers to overcome adjacent channel interference.

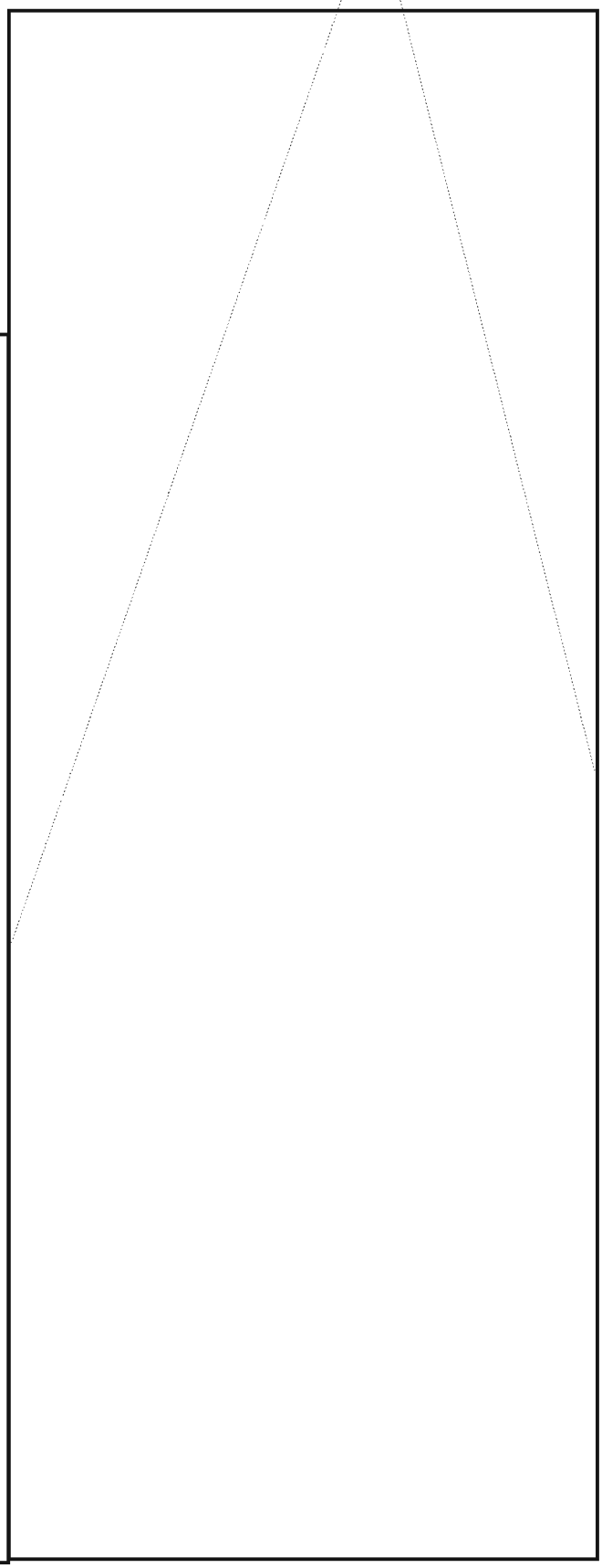
Conclusions (U)

(U) Developments in radio science bring about a large number of gradual improvements in the big telecommunications systems, as well as initiating some radical changes. Both kinds of change accumulate to bring complete

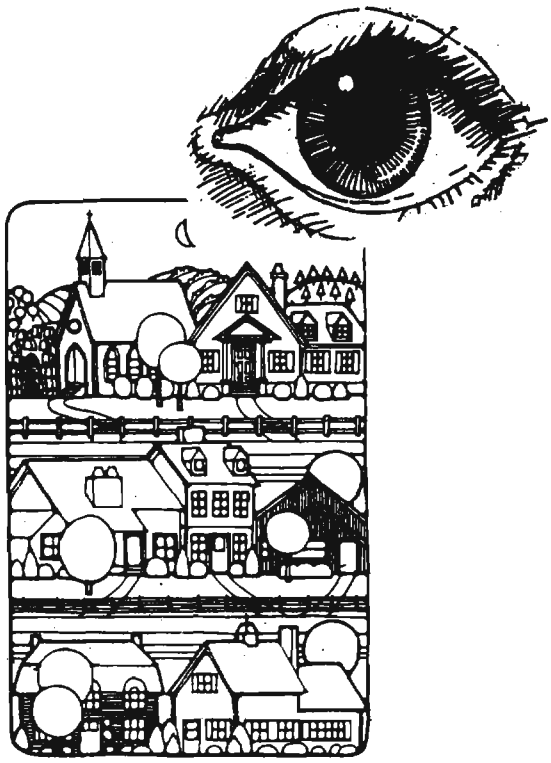
transformations in the way telecommunications operate and affect things.

(U) The main impact of radio and optic developments will be in transmission, where a generation of technology lasts about 15 years. The effect on switching, where technology life cycles are about 30 years, will be delayed until the 1990's, after the current commitments to digital electronic switching are fulfilled.





by E. Leigh Sawyer, B4



SLEEP WELL! YOUR SDO IS ON DUTY!

(U) I seem to detect a growing trend for people to rummage around in their cryptologic attics to describe certain events or occasions taking place in the olden days. Doing a little rummaging on my own, I recalled a long-abandoned function once carried out by company grade officers identified, as they popped up periodically on the master roster, as "SECURITY DUTY OFFICERS" (SDO). This system was in its heyday in the early 1950's. At that time, AFSA (soon to be NSA) was split between the Naval Security Station at Nebraska Avenue and Arlington Hall Station. As a digression, this split had its interesting features too -- like the time I drove my car from NSS to AHS during the day and took the shuttle bus back. At quitting time, I naturally couldn't find my car in the NSS parking lot and was at the point of reporting a stolen car case to SEC when I realized what I had done. I managed to catch the last shuttle back to AHS by the skin of my teeth. Ah, those were the days! Well anyhow, back to this SDO system. It was used at NSS (whether it was used at AHS escapes me). In any case, it was a so-called "sleep watch." For this purpose, a cot was located in SEC spaces so that the SDO could catch some sleep between his late evening and early morning rounds of all the AFSA spaces.

(U) A word or two about the cot might be in order. The mattress was obviously not configured for sleeping purposes. What it was stuffed with must remain somewhat problematical, but I suspect it was a mixture of corn cobs and pine cones. I wonder if somewhere in the archives there still exist the logs maintained by the SDO's. References to that mattress were rife in these logs, e.g., "after the worst night of my life", "started my morning round with every bone in my body screaming agonized protests", "millions for a new building at Meade; why can't SEC provide a decent mattress?" and "even my teeth hurt."

(U) It should not require too much imagination to determine that periodic one night stands of this sort were mighty boring. So

what do you do to lessen the boredom? Drink coffee, of course. Unfortunately, there was not a hint of either coffee or coffee-making paraphernalia discernible in the SEC spaces. This led to a preliminary round of visits to adjacent spaces to locate a coffee mess, relocate the pot and can of coffee to SEC spaces, and return them carefully in the early morning hours. After all, "nothing's too good for the boys in the Service." This system was not without its pitfalls. Like the Navy lieutenant, whose name is no longer retrievable from my data base, who had a memory lapse and couldn't remember the office from which he made the "borrow." He handled the situation neatly, however, with the following entry in the log: "Coffee pot and can of coffee found adrift in Building 18."

(U) It was somewhat rankling that SEC, which conceived this Security Duty Officer concept in the first place, couldn't provide a little lousy coffee for us. I recall roaming around the SEC spaces one evening surveying all the possible places where they might hide their coffee and equipment. The survey narrowed down to one small cabinet locked with a brand new shiny Sargent and Greenleaf combination padlock. The cabinet had undeniable coffee stains on top and was so decrepit that forced entry would have probably taken about 15 seconds. I reasoned that a rickety cabinet of this sort certainly wouldn't be used for anything classified. So why the formidable padlock? "You don't suppose", I mused to myself. I then proceeded to dial 10-20-30, the factory-set combination. EUREKA! It opened. When I opened the door, I beheld a complete coffee mess. It was not exactly as though I was discovering the tomb of Tutankhamen, but the sensation was somewhat the same. I shared this revelation with a few of my friends who were also obliged to stand SDO duty. But, alas, the SEC coffee mess vice president must have discerned that the coffee level was dropping far faster than it should. Accordingly, it was not too long after my initial discovery that 10-20-30 no longer worked.

(U) The real psychic bennies for the security watch types were in the form of finding classified materials "adrift." As a result, there was no doubt in my mind that we were looked upon as pests by the various organizations making up our beat. For that reason, access doors to the various operational spaces were generally kept locked to keep us (and incidentally others) out. This meant that the Security Duty Officer most often was limited to walking along murky corridors in the various buildings used by AFSA in the NSS compound. However, on one occasion, circa 1952, I found one of the doors open to an R/D area. Oh man, the fox was really in the hen house! After I had spent a good deal of time going through every nook and cranny where something classified might be lurking, I finally was rewarded -- a classified manual (CONFIDENTIAL). I recall that I thumbed through it and, in retrospect, imagine if it had been tossed over the fence into the Russian Embassy compound, they would probably have thrown it back out. However, it was marked CONFIDENTIAL and that made it fair game. As best as I could determine, the owner of the bookcase was identifiable by the name plate on the nearby desk. So I wrote it up dutifully noting the name of the responsible person:

DR. LOUIS W. TORDELLA

~~(C)~~ As luck would have it, Dr. Lou was soon after reassigned to the Plans and Policy Division, where I worked, to spearhead a highly innovative experiment called "Third Party". I confessed to him that I was the culprit who gigged him and expressed the hope that I had not set him back in his career in some fashion.

(U) So much for the SDO system. It went the same way as smudged carbon copies of TECHSUMs, A and B buildings, AFSA-062 and AFSA-063, and red phones.

Ou sont les neiges d'antan?

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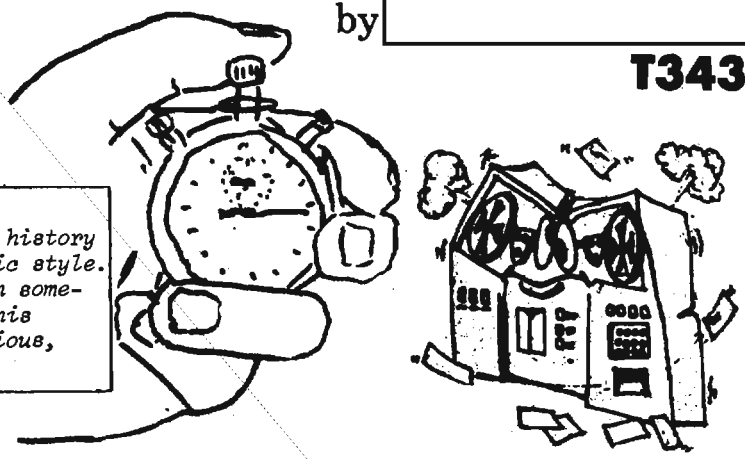
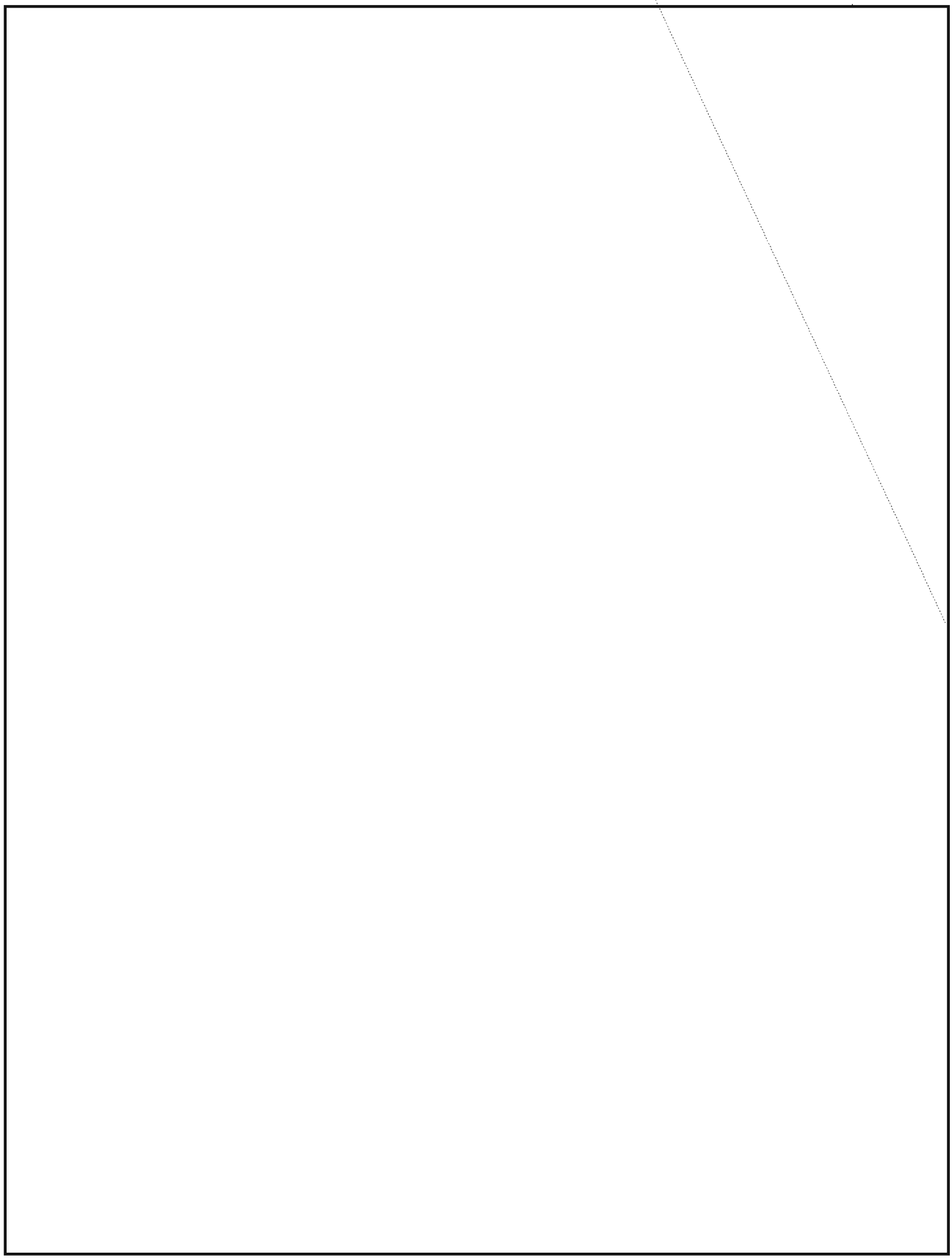
TIDE: A Brief History

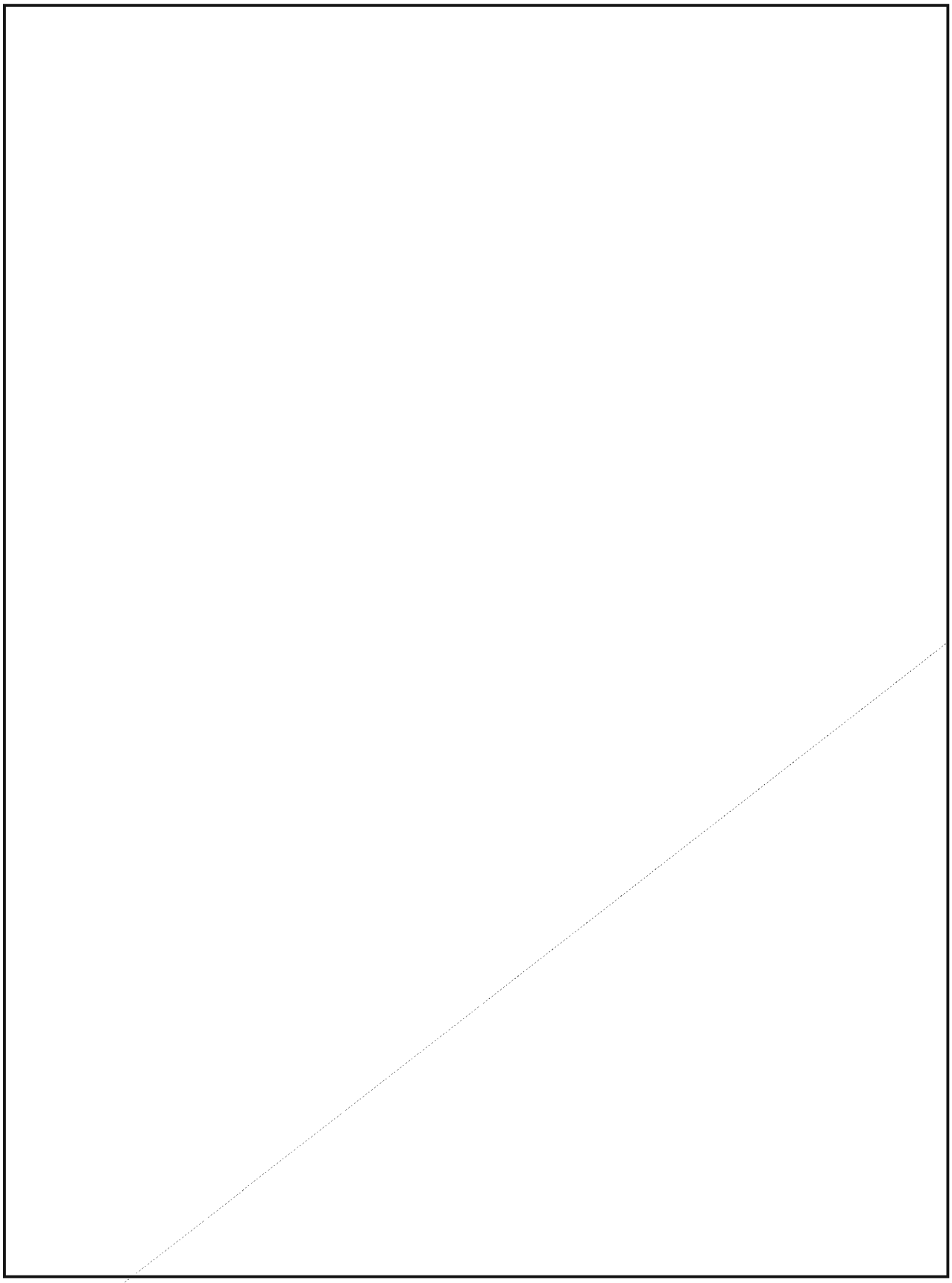
by [redacted]

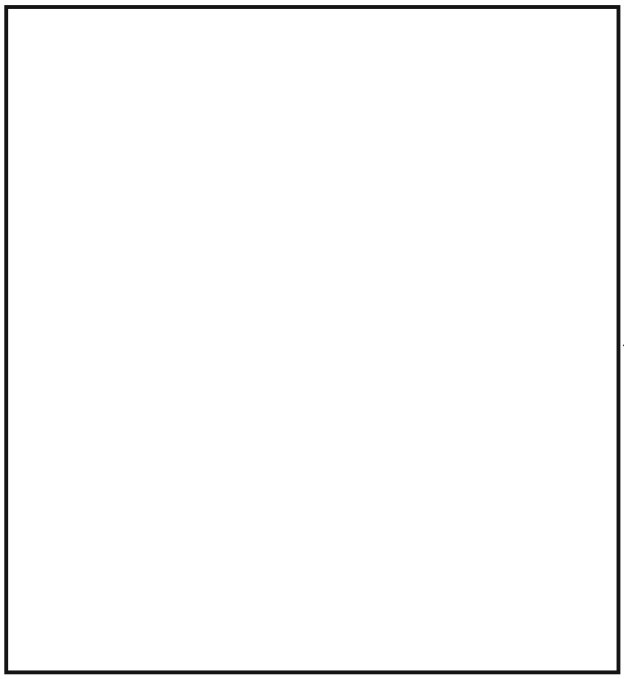
T343



Author's Note:
Too often in our business, a project's history is written in a cold, hard, bureaucratic style. In this paper, I attempt to describe in somewhat human terms the story of one of this agency's more successful, albeit vexatious, computer systems.







Relief at Last (U)

(U) Thereafter in rapid succession over the summer of 1981, more TIDE processing systems were accepted by PREFACE thereby providing additional TIDE relief and yes, some well deserved rest.

(U) Although some disruptions and minimizations still occur on TIDE, they are infrequent (in comparison to previous events) and are primarily caused by hardware and/or software failures - not solely loading demands. TIDE is looking forward to retirement.

The Future (U)

(U) Once TIDE is finally relieved of its remaining terminal responsibilities (e.g. high speed printers, CRTs, etc.) a full decade since its creation, it can be unplugged. Because the soul of any computer system is its software, what was once called TIDE will remain only two antiquated 1965-vintage UNIVAC 494s. These machines will be returned to their Mid-West Minneapolis birthplace, be reconditioned, and, if lucky, enter a retirement of loving care by high school or college students.

(U) To sum up our experience - this Agency's use of TIDE has not been an easy one. Many of those associated with TIDE, however, believe that the processing crises and sleepless nights were worth the achievements this system has somehow performed. It is believed that TIDE produced far beyond its expectations, and many believe the feats it performed, and the people who have made it possible to simply "maintain" for such a period of time, should be commended.

(U) However, no matter what its history, TIDE was simply a little imaginative software, two machines, and an assortment of peripheral equipment. When it failed to respond to a crisis or an analyst was unable to retrieve important intelligence, it simply became a useless tangle of wires.

CRYPTIC CROSSWORD SOLUTION, November 1981

Across

1. PARSNIPS (par + s + nips)
5. ARMPIT
9. COUPLETS (double definition)
10. SONORA (son + or + a)
12. EATS (anag.)
13. STOAT (orders to attack)
14. PUNT (top untied)
17. DEMONSTRATOR (demon's tractor - c)
20. MELODRAMATIC (anag.)
23. RARE (double definition)
24. SEALS (less + a; anag.)
25. FUZZ (double definition)
28. LEGEND (leg + end)
29. CLERICAL (cleric + la reversed)
30. ANTHEM (ant + hem)
31. ANACONDA (Dana anag. + a + con)

Down

1. PICKET (double definition)
2. ROUSTS (r + ousts)
3. NILE (anag.)
4. PETITION ANEW (anag.)
6. MOOR (reverse spelling)
7. PRODUCTS (pro + ducts)
8. TRAITORS (anag.)
11. MARSHALL PLAN (marshal + l + scheme)
15. READS (pun for reeds)
16. DRAIN (D + rain)
18. UMBRELLA (anag.)
19. ALL RIGHT (everyone + not left)
21. VULCANIZE (Vulcan + ize)
22. AZALEA (as + a + lea)
26. ONCE (induction center)
27. ERIC (Japanese rickshaw)

NSA-Crostic No. 36

Two recent tragic accidents .... add up to an eerie coincidence

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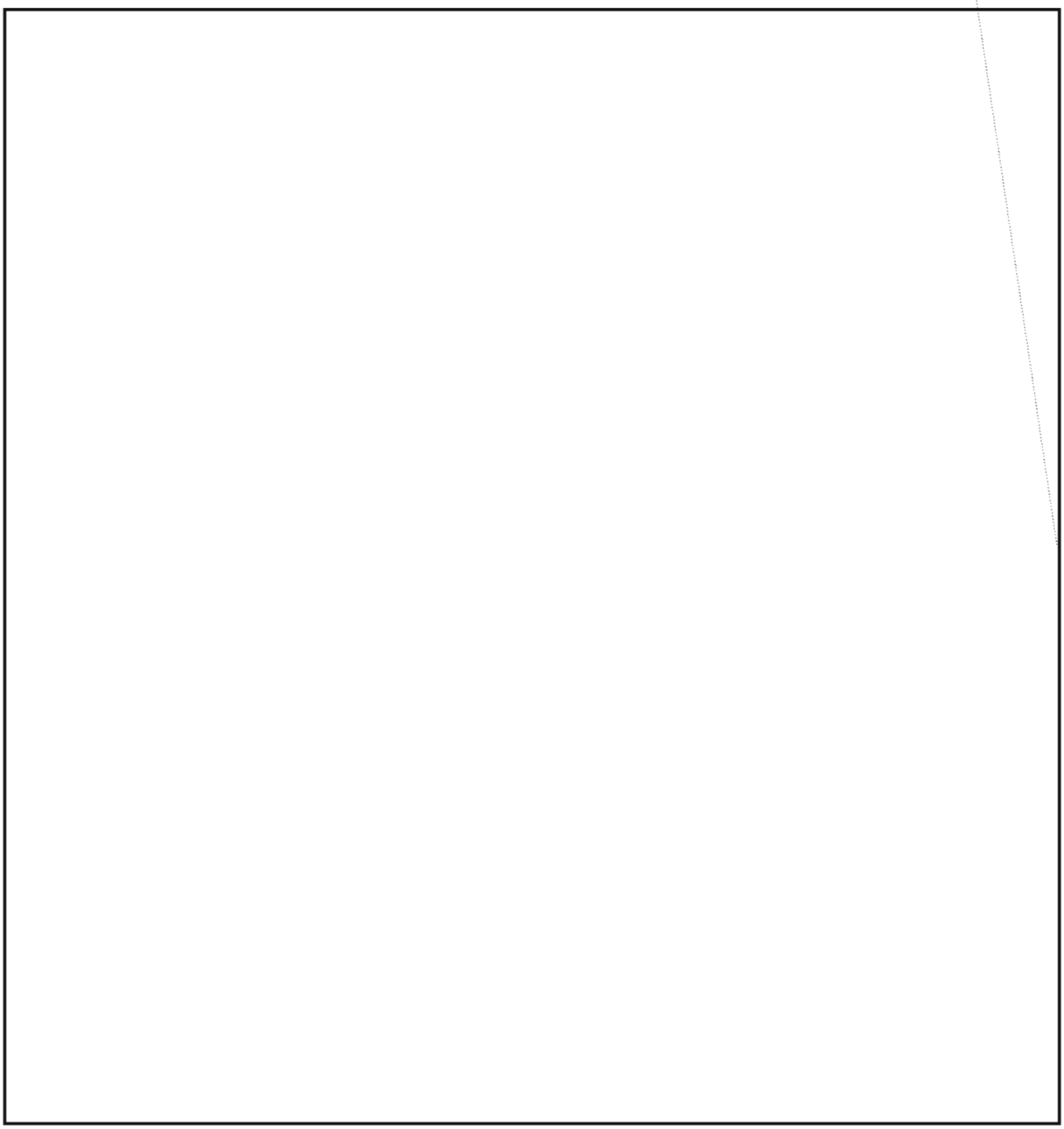

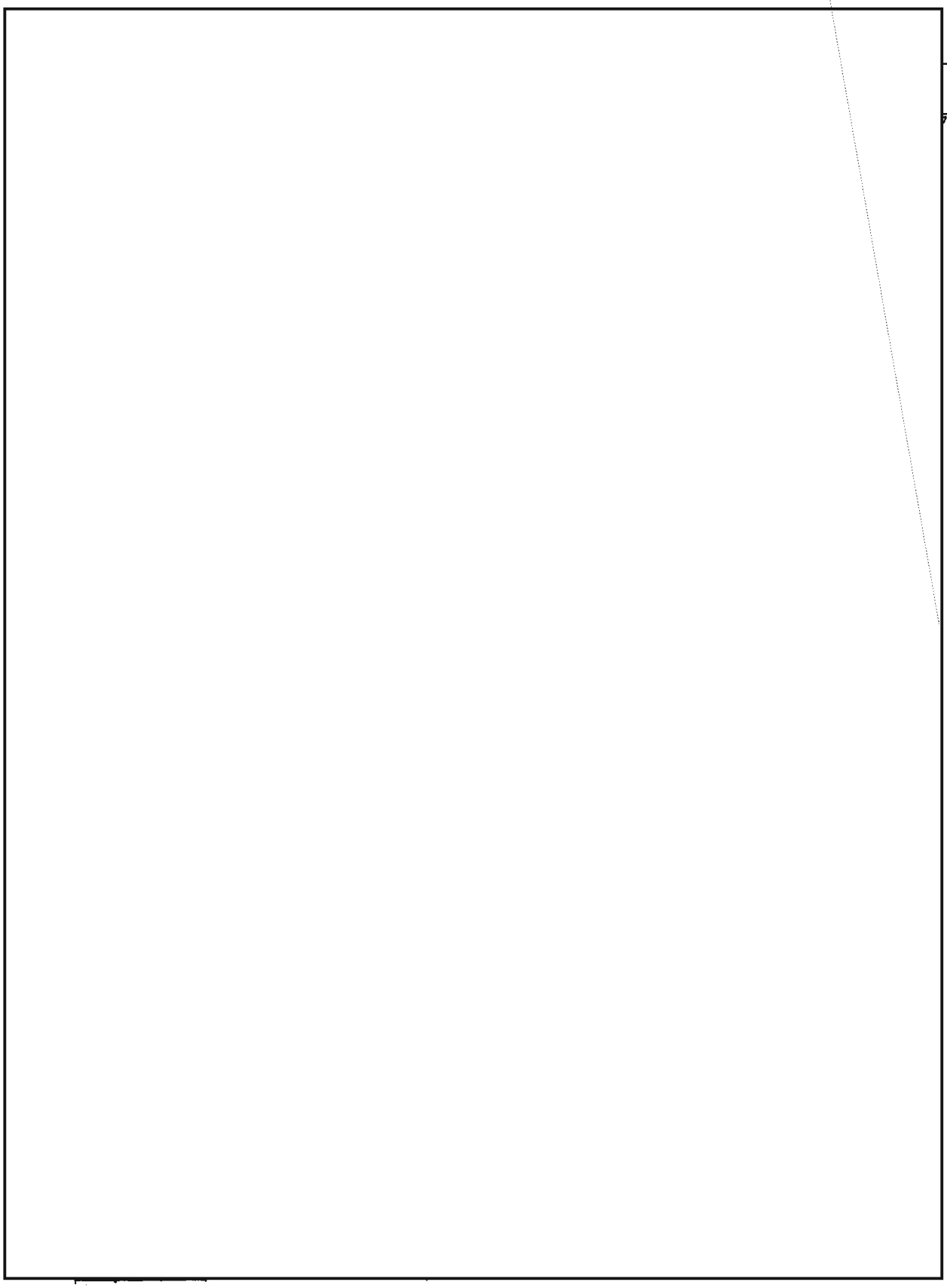

In Pursuit Of:

Faster Horses

YOUNGER WOMEN

Older Whiskey, and

MORE MONEY(U)

by [redacted] P14

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For the past two years I have been involved with a project that has given me more, in terms of psychic income and pure excitement, than perhaps any work-related activity (U) that I remember. When you feel this good about something it seems natural to want to tell everyone else and share the excitement. Sort of a "look what I found" feeling. Of course, when you feel excited about something, it is difficult to know whether or not you have something worth saying and can remain objective about it. Nothing makes you feel quite as foolish as discovering the wheel only to find out that you were the only one who didn't have one all along.

(U) I've followed -- from a distance -- the articles, letters, and symposiums decrying the diminishing number of analysts, the dilution of the career field, and the increasing work load. I really have nothing to add to the body of literature that has grown around those themes. I would like to note that some reasonably intelligent people have advanced them. Conversely, some reasonably intelligent people made the decisions that led to the described conditions.

(U) Having resisted the urge to vent my excitement on paper for this long, I thought I had it under control. Actually, I have been writing this piece all along. Part of my control mechanism was simply typing my thoughts on the screen and then hitting the delete button. That may happen to this version and you will be spared once again. I'll tell you what "set me off" this time a bit later. First, let me tell you what I've been so enamored with.

(U) I'm a Traffic Analyst. Several years ago I began to work for the person I respect most in that field and share in the development of what has come to be called a Traffic Analysis Workbench System. What ever comes of that effort, I'll always be grateful for being included.

~~(FOUO)~~ The idea is a relatively simple one: In terms of technology, the TA field is, and has always been, behind the power curve. Regardless of what high powered machines exist, and in spite of the fact that some extremely sophisticated machine applications have been designed for analytic purposes, the analyst is still behind. There are several reasons this situation exists. However, it is primarily because analysts are directly

dependent upon their machine support personnel. A few have managed (mostly out of frustration) to learn one computer system or another and support themselves. The problem with this is, if they were any good at it, they were usually lost from the field.

~~(C)~~ It's time the analyst was given some help. Not to catch up to technology, just to keep from getting further behind. Given the costing cycle, the procurement cycle, and the installation cycle, I'm convinced that catching up is not possible. Not possible! The concept of a TA workbench involves installing a terminal on the analyst's desk. Read that again! On the analyst's desk. Not down the hall in a "machine room", not in a corner of the basement, and not around the corner where it "won't bother anyone"; on the analyst's desk, the one they sit at.

This puts the analyst in a position to access the major data bases, where the daily traffic as well as the technical working aids, reside (hide is a better word). With the terminals on their desks, they will have constant access to their material and perhaps approach the paperless environment.

~~(FOUO)~~ Under the umbrella called PINSETTER, we have been proceeding along a development path that will hopefully lead to the kind of help the analyst needs. Because the most precious computer resource is the programmer, the analyst must be released from depending on him for every minor need. This is true for several reasons. First, the analyst needs to be able to access his data, process that data, and change those processes without having to write memos, generate specifications, write justifications, wait for software and then participate in debugging. Second, the programmer, as a resource is too valuable to be tied up with changing sort specifications every time an analyst needs a different output. Lastly, the plain facts are that we have a terrible time retaining good programmers. No sooner do we develop a good working relationship with a top-notch programmer, and he begins to understand something about an analyst's job, than along comes a better offer and he's gone.

(U) From a machine standpoint, meeting these goals requires a system that is easy to learn, flexible, and provides a reasonable response time. By "reasonable", I don't mean instantaneous. Most analysts can live with an execution time that is not measured in nanoseconds. Most of our work has taken place on a PDP-11/70 host using UNIX as the operating system. UNIX is a high level language that was developed by Bell Laboratories. It meets the above criteria plus it is very forgiving to a klutz at the wheel.

~~(C)~~ We have found that most of the processes that a Traffic Analyst needs to be able to do can be accommodated with the UNIX package. Where it was found lacking or inefficient, the solution has been provided by a unique working relationship with a small group of highly talented programmers in T333. The

(U) To digress for a moment, the realization that certain processes are simply too big for TSS applications is important to maintaining a proper perspective. This determination must be made, and large "number crunching" must be performed where they are most efficiently handled. However, the process can often be executed where most efficient, and the results passed to where they can be best used, on the TSS. I might add, in two years of handling TA processing, it has been necessary to "send out" only one job for actual execution on a "big" machine. Of course, many of our extracts from major data bases are "preprocessed", prior to transfer, to make them more TSS friendly. But I discount this, since it is largely "invisible" to the requestor.

~~(FOUO)~~ If the solution were apt to provide a useful "UNIX-extension", we would request T333 help. The results have been the most rewarding part of this experience: generalized UNIX-like utilities that solve analytic processing problems. The big plus? anyone who

knows a little UNIX can use them. On the other hand, if the solution appeared to be problem specific, we would attack the problem with our own resources. The results of these efforts have proven equally rewarding. Based on our own experience and some operational testing in analytic elements of A3, B2, B5, G6, and G9; I'm not sure if a more effective analytic tool than UNIX could have been designed if that had been Bell's intent. This leads to a philosophical difference in user support design.

~~(FOUO)~~ There is a mask-and-menu school of thought that holds to the belief that the user should be led through the processing cycle by the software. A menu is presented with a few options to select from and a mask provided through which to make alterations. These M&M's believe it is best to protect the user from the complexities of the system and protect the system from the klutz at the wheel. It has a place. I would look to this area for the type of handling necessary for, perhaps, TEXTA updates.

(U) Another approach is to provide the user with the modules necessary to manipulate the data, a high level language to package the modules, and the ability to communicate with other users and peripherals such as high quality printers. Basically, a sort of Procedural Applications Language that is not unique to Traffic Analysis. Perhaps a Universal Procedural Applications Language approach. The user is free to design personal processes and, more importantly, change those processes at will. Users are not dependent upon the programmer for every minor modification, routines do not have to be recompiled after each change, and the results of the changes are immediate. I believe UNIX meets this challenge.

(U) The M&M approach keeps the analyst (or user) dependent upon the programmer for modifications. Thus, preserving the problem of too much demand being placed on a resource that is already over taxed. The solution to the demand for software packages has all too often been the letting of contracts, at considerable expense, to develop processes that a few analysts, skilled in a handler like UNIX, might be able to get along without.

(U) If our own resources were concentrated in a manner conducive to the development of generalized handlers (a Universal Procedural Applications Language), and perhaps a bit of that contract money concentrated into rewarding the good programmers we have left, we might be able to come up with better analysts and better programmers. As a by-product, we might be able to handle the workload with the number of analysts we have and do a better job of it.

(U) So, what was it that set me off this time? A few days ago, while demonstrating a few system capabilities to a potential user, I was walking through the steps of a UNIX shell file (merely a collection of UNIX commands that execute sequentially and perform some process) and he asked me if I "wrote this program". The words startled me. Wrote a "program"? Me? I'm a Traffic Analyst, I can't "program". My rather bumbling answer was something to the effect that this is really not a program just a collection of instructions to perform a certain process on this computer. After he left I put the shell on the screen and read it a few times. By gosh, a few years ago I would have called that mess a program myself. It "looks" like a program. It "acts" like a program. And, my extemporaneous answer wasn't too bad a definition of a program.

~~(C-CCO)~~ I had to pause and reflect a bit. I put that shell together in about five minutes. What does it do?

[redacted]

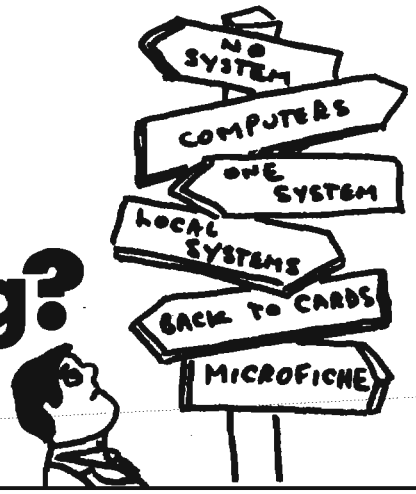
Based on past experience in trying get a process to do a select of this nature, and going through the "channels" to get it; this "quickie" shell seems fairly powerful.

[redacted]

(U) I think I've found a faster horse, I probably couldn't keep up with younger women anyway, and I'd rather have a cold beer than older whiskey, so if anyone knows someone looking for a "programmer", I'll settle for two of four.

TEXTA

What is it? Where is it going?



by [redacted] P1

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TEXTA means Technical Extracts from Traffic Analysis, and represents an agreement between four national centers concerning -

(S)

- the exchange of basic traffic analytic information;
- the sharing of a common, uniform recording and labeling system of traffic analysis information about COMINT targets worldwide;
- a common book of rules, the TEXTA manual, which the four centers accept as the authoritative description of how the TEXTA system operates;
- the highest, most accurate level of knowledge on a target communication.

[redacted]

EO 1.4.(c)
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How Current Should TEXTA Be? (U)

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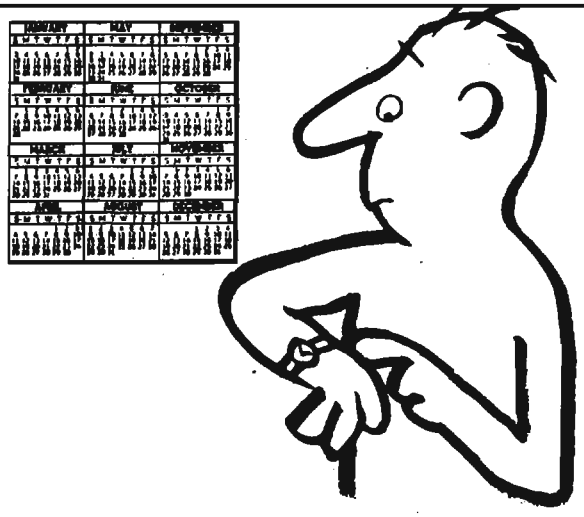
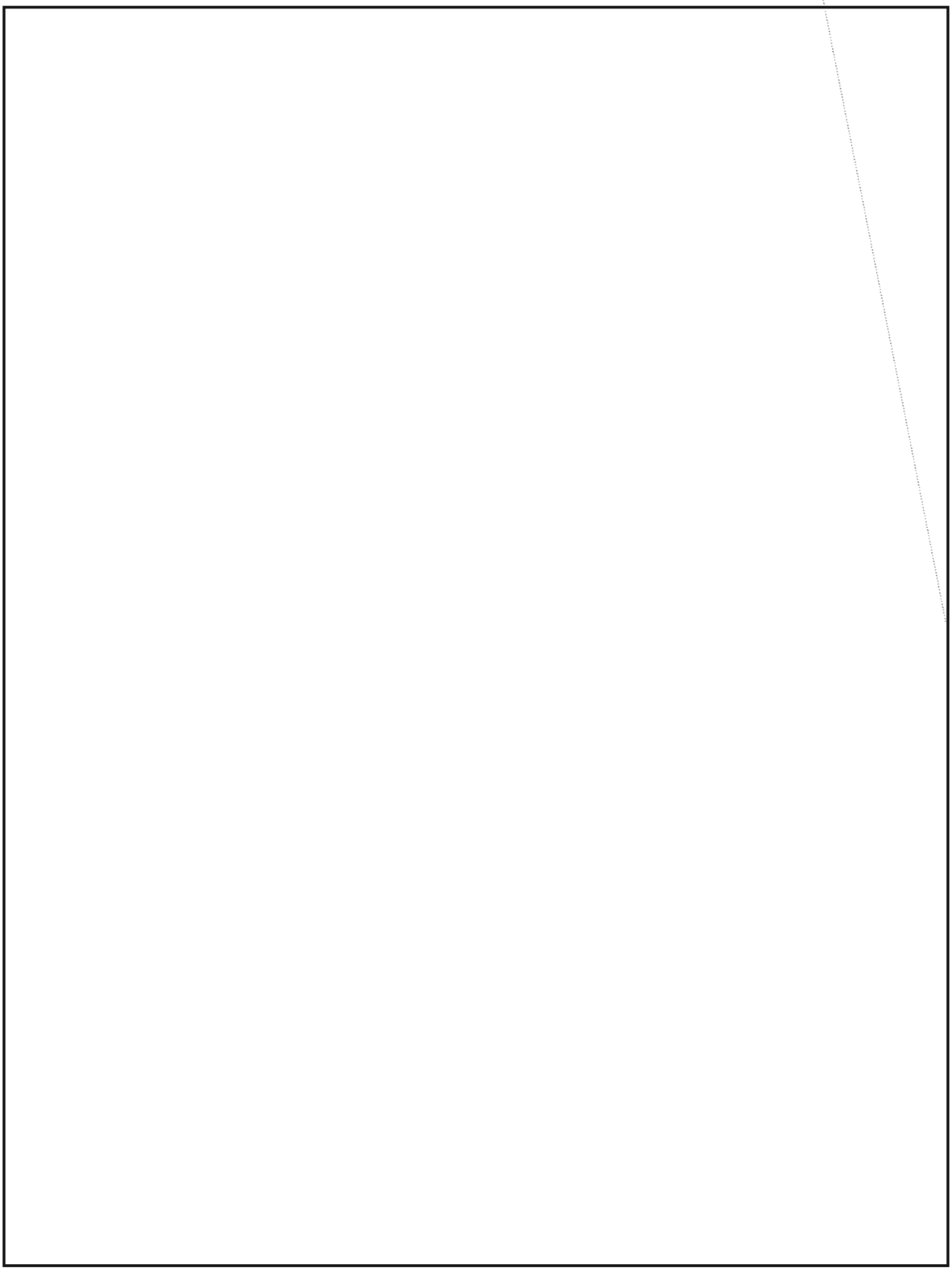
EO 1.4.(c)



Using TEXTA for Collection Steerage (U)

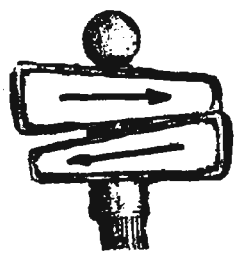


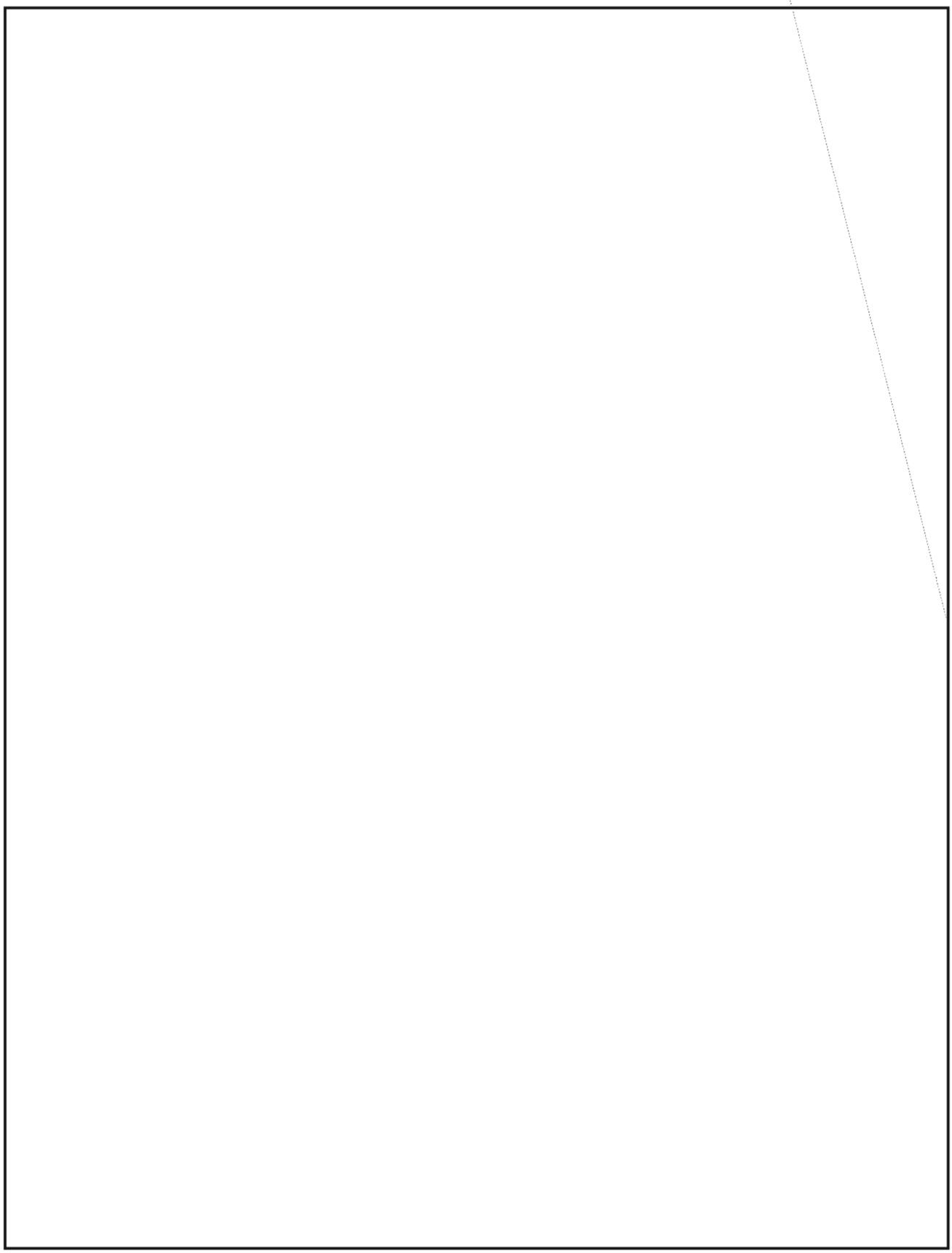
Where is TEXTA Going? (U)

(U) Such "low validity" data, even though current, should not cause the older, but more authoritative, analytic results to be erased from TEXTA — they should coexist side by side in the record. The ease with which data can be lost through erasing and/or spillage is a major problem in computer based data systems and is one that will need special attention for TEXTA in the future. The future system should be set up to insure that no data is erased unless a backup record (such as microfiche) is first generated. Data no longer wanted in the current file, because it is either out of date or superseded, should be shifted either to "near storage" or "far storage", depending upon the likelihood of having to retrieve it at some later date. Near storage is defined as some machine-retrievable form, such as tape, where the data can be retrieved relatively easily, whereas far storage is defined as some form that is essentially not machine-retrievable, such as microfiche, where the data can be retrieved only with great cost and difficulty. (The cost of "repoking" or otherwise retrieving data from microfiche may make such efforts rare, but it would be unwise to rule them out entirely; sometimes the thing MUST be done, even if it has to be done entirely by hand.) Data might typically move from current on-line storage to near storage, and then after a specified period of time, to far storage.

(U) Future TEXTA will need an integrated system of "audit trails" to accommodate the variety of levels of data that will be in the system. At the minimum, the system will need -

- the date of the action which changes, adds, or deletes the information.
- the source of the action (at a minimum, the organization submitting the action, although at some locations the initials of the analyst might be needed).
- the validity of the information involved in the action.





the recipient).

[redacted]

[redacted]

[redacted]

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EO 1.4.(c)

What Should the Future TEXTA System Look Like? (U)

[redacted]

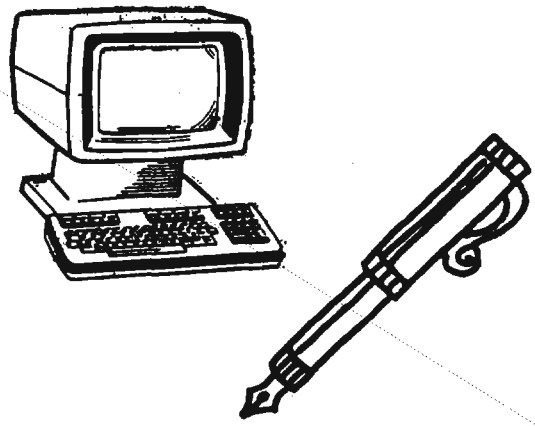
Sprechen sie TEXTA?

Parlez vous TEXTA?

говорите по-текста?

Habla TEXTA?

Parla TEXTA?



class citizenship in the system because he cannot afford some special piece of equipment or because he has no software support of his own.

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EO 1.4.(c)

(U) The system should provide for some kind of audit trailing, so that a selected class of user (i.e. some but not all) can determine:

- ★ who put a particular piece of data into the system?
- ★ when?
- ★ what "validity" was ascribed to it?
  - ● "low validity" entries cannot erase/replace "high validity" items already entered;
  - ● several variants (different sources, different validities) may have to coexist in the system for extended periods of time.
- ★ items erased/replaced (are not typically thrown away);
  - ● are retained in the "dark end" of the record (or in "near" storage) for an extended period, then are stored in microform (or "far" storage); and
  - ● remain available for audit trail purposes.

with a computer complex. No user need be kept out of the system, or reduced to a second-

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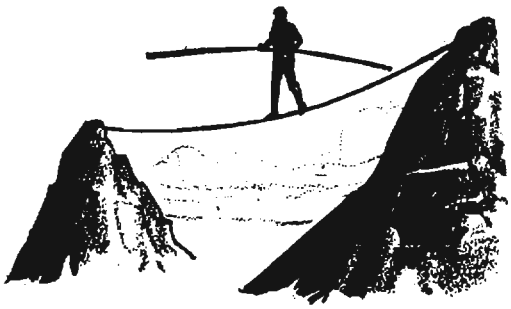
PLATFORM:

How Did You Say That Works?

by [redacted] P4



(U) A system has been designed, implemented, and delivered which allows users to sit at their favorite terminals, and travel all over the world to accomplish their assigned task. All that is required of them is a few simple standard commands. Oh, wouldn't that be great!

~~(FOUO)~~ Wait, aren't you talking about the PLATFORM network? Isn't that the way it works? Almost. We are close, but we aren't there yet. Simple things, little things, that appear trivial when looked at individually, work together to cause most of the current PLATFORM user frustrations. The general idea of PLATFORM is a good one, but it seems that, for those who actually have to use PLATFORM, something has been lost somewhere:

- Terminal characteristics that differ from one terminal to another as well as from one host to another.
- Terminal functions that can be used on some network hosts but not on others.
- Response times on network-connected terminals that exceed normal expected overhead.
- Multiple logins between hosts and again for processes or applications once logged into the hosts.
- Limitations on the number of connections that hosts will accept from the network.
- Call-ups of network protocols that are slightly different from one host to another.
- Network capabilities that are supported on some hosts and unavailable on others.

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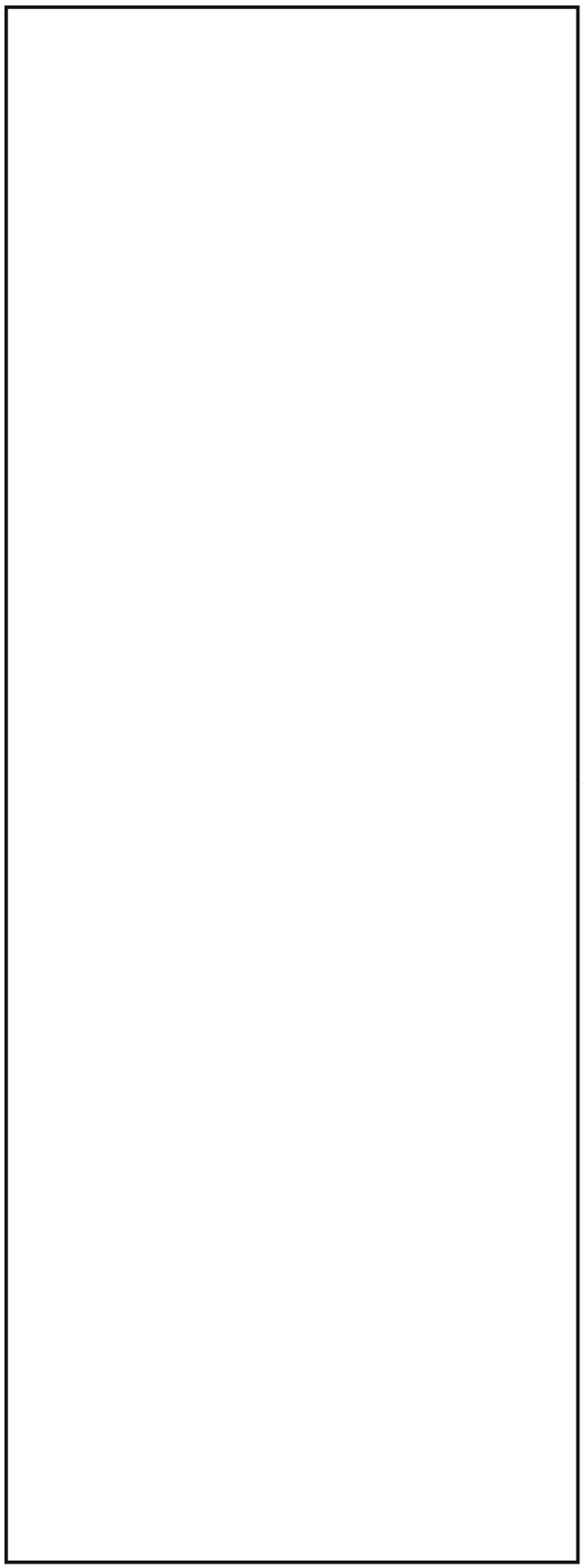

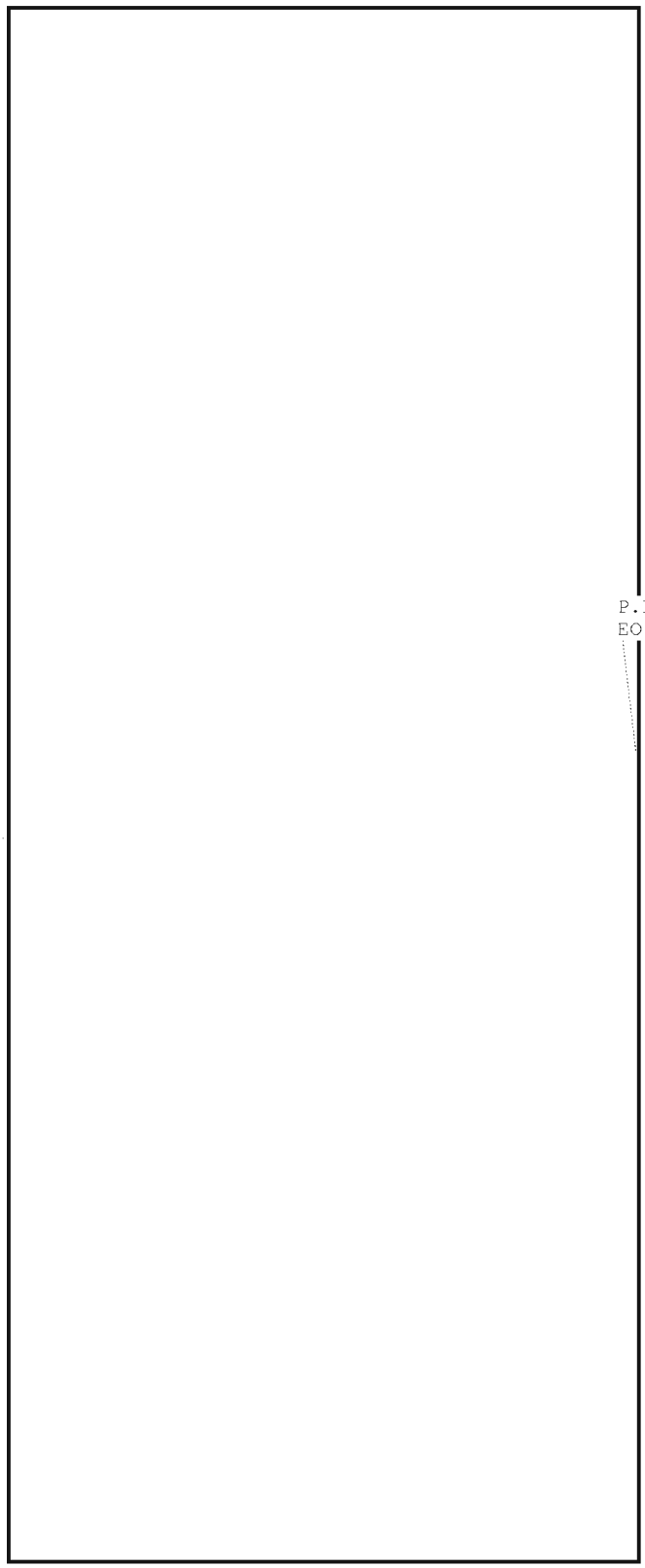

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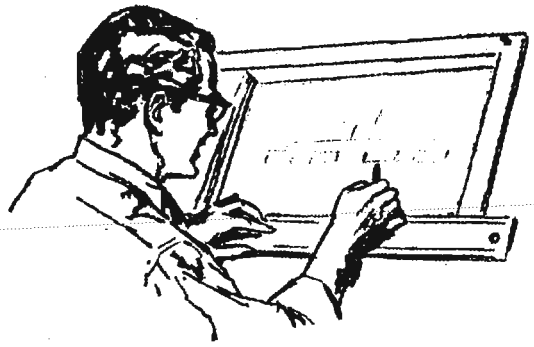
EO 1.4.(c)

(U) Let's make it a tool that serves those charged with carrying out the mission of this agency.

In The Name of Efficiency (U)

review by

[redacted] P13



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(U) BOOK REVIEW:
Joan M. Greenbaum, In the Name of Efficiency, Philadelphia: Temple University Press, 1979 (NSA Main Library, QA78/G82)

(U) The subtitle of this very interesting and provocative book is "Management Theory and Shopfloor Practice in Data-Processing Work". It presents a frank and (to my eye) refreshingly critical and challenging review of the history and social context of computer programming and operating. In the view of the author, this history has been marked by a tug-of-war between management and the data processing workers. On the one hand, management has been uncomfortable with the freedom which programmers had in the early days of computers, and has found ways to limit that freedom, with increasing success. Programmers, on the other hand, have fought back to preserve the work satisfaction and status of their occupation.

(U) Here are a few brief quoted passages from the book, to illustrate the approach. Ms. Greenbaum begins her Introduction with the following personal scene-setting: "Back in the 1960s I was a computer programmer. Like most of the 200,000 or so other programmers, I enjoyed the work - particularly its opportunities for diversity and challenge. Comparatively high-paying, computer programming offered high status because its skills were little understood and in great demand. By the early 1970s some of the craftlike characteristics of this work had begun to change. The changes, like most day-to-day happenings, appeared quite slowly. But as they began to increase in tempo, it gradually became apparent that work activities once controlled by data-processing workers were no longer in their control." [p. 3] She continues, "In what began as a personal study, I set out to explore what was taking place in data-processing workshops and why it was happening. Many have said that the changes in the work process were just the results of 'normal' changes that occupations go through as they mature . . . What was most noticeable about the changes in each occupation [so affected] was that they were anything but 'natural'; workers fought against these forms of change, and managers had a hard time implementing them . . . The reasons for changes in the workplace are not always the reasons that appear on the surface." [p.5] She states that her purpose is not merely to "bemoan the lost days of craftlike activity," but to reveal the underlying reasons behind the changes and enable workers to understand, influence, and regain control over the workplace.

~~(POUO)~~ I was particularly interested by her review of changes in the field; I myself remember many of them as they happened here at NSA. What was once a single profession, "programming," (where a "programmer" carried out all phases of the task from problem definition to operational running of his program) was fragmented into disciplines performed by very different sets of people: operators, programmers, systems analysts, and keypunchers. The separate disciplines were often divided from each other by distrust and hostility as well as by the physical and organizational "walls" of the "closed shop" philosophy which was popular with management for a while. The advent of operating systems removed much of their new power from the hands of one of these new groups - the computer operators. All these changes, Ms. Greenbaum convincingly maintains, were results of deliberate efforts by management to "divide and conquer" the recalcitrant data-processing workforce and "rationalize" their work, in order to bring them under management control. Interestingly, she makes a clear case for the origin of the "professionalization" of programmers in a management initiative, and claims that this, too, far from being a desire of programmers themselves, was a step toward control of data processing workers by management. Structured programming is another obvious landmark in management's strenuous (and all-too-successful) efforts to remove inconvenient degrees of freedom from the programmer.

~~(FOUO)~~ Most of all, the IBM 360 systems made a dramatic break with the past. Ms. Greenbaum says the following: "Those of us in the field at the time of the introduction of the System 360 tend to remember it well, for almost overnight a firm division of labor occurred, not by chance, as it seemed to us then, but by clear design. Although computer work had been divided by task in the 1950s, many activities had overlapped a good deal. In particular, computer programmers and operators would meet in the computer room, which, like a social hall, offered the opportunity to exchange techniques and ideas. The installation of the System 360 provided management with reasons to change this. One of the first rulings to be enforced was a prohibition against programmers entering the computer room, thus isolating the two categories of labor and cutting off exchange of functions and rigidifying job classifications." Ms. Greenbaum analyzes the theory whose application by management brought about these changes in Chapter 3 of her book. She provides provocative treatments of "Shopfloor Practice," "Labor Process," and "Worker Behavior" - the interplay of workers' responses and resistances against management's initiatives in the daily operation of computer shops. She covers a great deal of very illuminating material concerning the workers' perception of their jobs and the changes enforced from above by management. I found many vivid echoes in my own memory of these perceptions as I experienced them in our own NSA computer installations, since I began in the "craft-like" times of ATLAS I, and lived through the changes accompanying the 704, 7094, and Systems 360/370.

(U) The author leaves us with an unexpectedly hopeful conclusion at the close of her book. She gives much weight to the efforts of data processing personnel in creatively remaking their work situation, and in particular finding new ways to cooperate and communicate with their co-workers and thus reclaim control over their work activity and restore challenge and satisfaction to their jobs. She concludes that "data processing workers have developed workplace activities and cooperative work practices that stand in sharp contrast to the rationalized bureaucratic hierarchy imposed by management. We are told that human nature is competitive and individualistic, but data-processing shopfloor actions contradict this. Effective data-processing work is usually accomplished by workers who help one another by sharing knowledge, skills, and tasks. By sharing knowledge data-processing workers have created, in effect, their own shopfloor culture that gives workers at least the ability to tolerate the contradictions they face every day on the job . . . When I first began this study I examined management justifications for efficiency and tried to compare these to what was actually taking place in the work environment. The more I looked the greater I found the differences between management and worker strategies for workplace activity . . . Work does <u>not</u> have to be organized to control human behavior. Efficient work activities can take place without the management ideology of social control. Examining workplace activities begins to point us in the direction of understanding other forms of work organization."

~~(FOUO)~~ The author's high opinion of cooperativeness and creativeness among programmers agrees well with my own experience when I was a full-time applications programmer. We shared ideas, helped each other to "debug" programs, shared labor (picking up runs), etc., and found ways to forgather in areas near counters, key-punches, etc. to exchange news, techniques, tips, and aid. We often had to do these things in spite of management's frowning upon our apparently unstructured activities, and our uses of spaces and facilities intended by management for other purposes.

~~(FOUO)~~ It seems evident that these considerations will soon become more crucial than ever. It will very soon be possible for much, if not all, programming and computer-aided problem solving to be done via remote terminals. Soon it will no longer be in any sense a <u>practical</u> or <u>physical</u> necessity for data processing workers or computer users to be located all together in one building. The only thing that might continue to force vast numbers of computer workers to be herded together in offices from nine to five, five days a week, would be the fear of management that any other arrangement might result in their loss of social and behavioral control over employees. I recommend Ms. Greenbaum's challenging book as a starting point for thinking about some of these issues.

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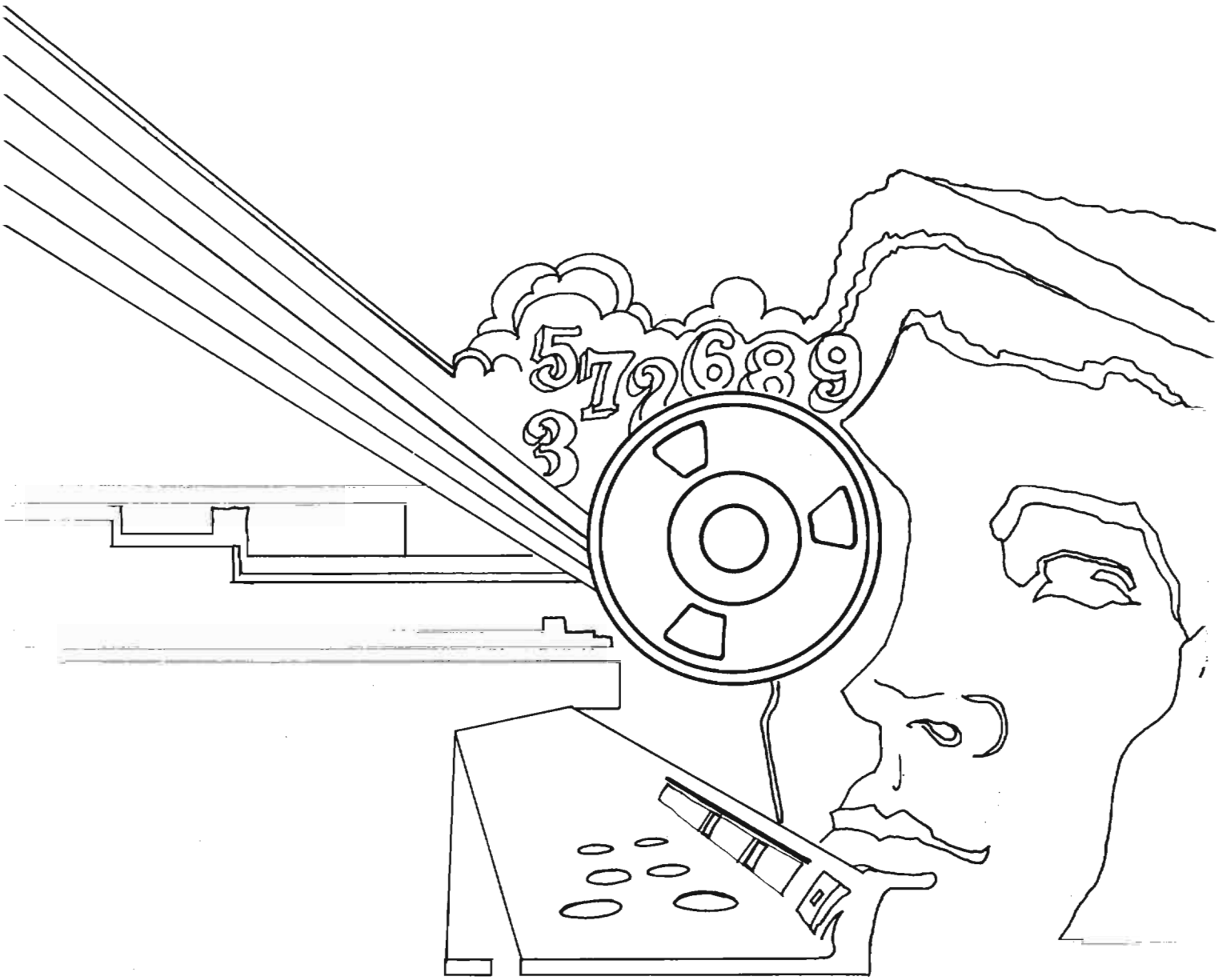
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