DOCID: 4012045

NATIONAL SECURITY AGENCY

CRYPTOLOG

The Journal of Technical Health

DOCID: 4012045

P.L. 86-36

CRYPTOLOG

Summer 1995
Vol. XX, No. 2

Published by P05, Operations Directorate Intelligence Staff

Board of Advisors

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Perspective:

An Interview with Terry Santavicca, NSA's Chief Information Officer

by [_____]

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Terry Santavicca, formerly chief of DDT's staff, has become DDO's first Chief Information Officer (CIO). He has served as chief of the DDT staff, Deputy Chief of DDT's Telecommunications Group, and Chief of the Office of ADP Support.

Why was the CIO position created?

(FOUO) It arose from the study commissioned about a year ago by Dr. Mueller (then DDO) to look at the state of information systems and ADP (automated data processing) within DDO. He felt that there were a lot of ADP-related activities going on in DDO that weren't well coordinated and that the culture was "stovepiped."

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(FOUO) So the DDO commissioned what's sometimes called the [_____] study: [_____] chief of J, and [_____] who was in DDP at the time, spent several months talking to a lot of different people inside and outside DDO. Of the many observations and recommendations of the report they published, the key one was that DDO needed a CIO who reported directly to the DDO. Dr. Mueller, who agreed, ran this by his group chiefs, who concurred, and shortly thereafter I was named as the DDO CIO. (Shortly thereafter Dr. Mueller left, but Ms. McNamara, the new DDO, has been every bit as supportive.)

(FOUO) I arrived here to take up the CIO job in late February. The idea was that somebody at a senior level in DDO would pull together the disparate activities in the ADP/information systems world and coordinate and interface with both the key components as appropriate to work these issues.

How have the other directorates reacted to the establishment of the CIO?

(FOUO) I think very well. In my view, part of the strategy of assigning me as a former (and longtime) T

person to DDO was to try to forge better ties between DDO and DDT in particular—those being the two main organizations involved in systems development, ADP and processing, etc. So I consider it part of my mandate to do that, but in order to accomplish that I've tried to expand current or initiate new forums to allow that to happen. For example, the ADPX (ADP Executive Committee), which had existed for some time, did include representation from T. Since I've come on board and do now chair the ADPX, I've expanded the ADPX to include representation from all key components. More and more of the ADP issues and architecture and networking and so really are corporate issues and need to be worked in a corporate way.

(FOUO) [_____] and I have agreed to co-chair a new board called the NSA Information Systems Group (NISG), a high-level IS direction and policy board which will have CIO equivalents from each of the key components who would deal with corporate cross-organizational ADP-oriented issues, something like the ADPX but at a level higher. The ADPX would work issues, problems, standards, and so on from its level, and then the NISG would determine final policy and implement or promulgate agency-wide.

(FOUO) Also, as the CIO, I represent DDO on the Technical Architecture Board (TAB), which is primarily a DT forum that relates to DDO's Requirements Executive Board (REB), which I am also a member. I know, more acronyms, but the point is there are renewed efforts for DO and DT to work more closely in coordinating requirements, architectures, and system developments.

Do you see any potential conflict with DDI?

(U) Well, the kind of issues we're working are not, I think, those that are the main business of DDI. It's more architectural strategies, and how they get networked in with the rest of us. When we come up with agency standards, we want to make sure we coordinate with them as well: standard workstation issues, and so on.

Since you mention standard workstations, is NSA going to continue to "recycle" older terminals, or will every analyst eventually have the same functional capability?

(U) Because of the HPW-2 contract, this is a bit of a contentious issue. The HPW-2 has been in effect for some time now but it has not really taken off very well even though the prices on the contract are very, very competitive. But because people have been locked into Sun, have gotten so familiar with the workstations, and because our system administration is oriented toward Sun, we've had a very hard time taking advantage of the HPW-2 contract.

(U) We're making renewed efforts to better integrate the HPW-2 into our environment but as a longer-term vision, to get back to your original question, I wouldn't like to see an HPW-3 contract bid competitively.

You think that more weight ought to be given to integrating a future HPW with what is here, rather than the basic cost of the next HPWs?

(U) Yes. Well, I think we have to worry about cost, but what we don't want to do is to be locked into any one vendor. And of course the vendor's strategy is to try to lock you in. But if NSA wants to be in a position to take advantage of the very fast paced technology, the best that's out there, we have to build an environment that will be heterogeneous.

(U) Now I think the right way to do that is to figure out how we can integrate a variety of vendors' products in this environment. And I think the right way to do that is to define our environment in terms of standards, the standards that it would take to fit into our environment and operate in a transparent way. Now that's a little bit idealistic but standards *are* moving in that direction. We can't yet define such an environment, but there are standards, for example, a single UNIX standard: the UNIX world *is* converging on a single UNIX and a lot of the vendors are working toward it. SOLARIS, Sun's operating system is on that path as well as IBM's AIX operating system.

There is certainly a lot more commercial off-the-shelf (COTS) software out there

available in the non-UNIX world than in the UNIX world. So in the long term we need to be careful to build an environment and a strategy that will be able to take advantage of all the kinds of things that are out there. That may mean we have to figure out how to integrate Windows NT into our environment-see, I said I'd get controversial. I know this'll make people's hair stand up, but I honestly believe that we cannot close off any of our options. I mean, five years from now UNIX might not be around, it might not be a viable system. When vendors develop a capability they usually develop it first on the systems that have the broadest market, and that typically is not UNIX. So we need to keep our minds open to non-UNIX as well as UNIX.

People like to use what they're comfortable with on the outside.

(U) That's right, and the majority of NSAers probably have personal computers at home, and they're not likely to be UNIX, so we don't really leverage that people learn and use and know how to use from home when they come to work. That's another disadvantage— I mean, UNIX does have a lot of good things going for it. It's always been very good in a networked environment and it's a very rich operating system on a workstation, whereas a lot of these older systems like DOS are very batch-oriented, you couldn't do multiprocessing, but now the rest of the world is catching up and there's not as much of a difference.

(U) I'm not anti-UNIX, by the way; I just want us to keep our options open. UNIX has served us well and will continue to do so. But, the direction nowadays not only at NSA but the entire community is COTS products, and there are a lot of COTS products out there to pick from, and the majority of them are not on the UNIX side.

What skill mix do you see the various computer-oriented specialties at the agency needing? For instance, how enthusiastic are hard-core programmers going to be about—well, the term "peeling shrinkwrap" has been heard.

(FOUO) Yes, I can understand why there might be some concern in that area. NSA has a long history of in-house development of major capabilities, major systems. I think the pendulum is swinging away from that. I think there will always be some subset of our capabilities that, because of the uniqueness, will have to have in-house development of at least parts of it. I think we'll have to learn how to do a better job of integrating various software packages together, build a system. The

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emphasis is to encourage people to look for software that's already available rather than to think in terms of writing new code: reuse libraries as well as COTS products. I know there are some efforts going on in some of our organizations to do this kind of software reengineering. We've been holding discussions of perhaps setting up special servers on our networks that have shared libraries on them and encourage people to take advantage of them. Even now, through some systems, you can go in and pull off software.

System administrators will probably have to become more versatile, too, if they're going to be working with a greater variety of products.

(U) Yes. The SA problem is another area that concerns a lot of people, considering the variety of systems that the SAs have to support. Now I want to be careful how I say this, but the quality of our SAs is very uneven. We've sometimes picked people to be SAs of no diminishing skill fields and moved them into system administration because they weren't needed elsewhere and some of them haven't had all the training that they probably could use.

(U) We need, through picking the right people, the right kind of training, and the right kind of tools, to make our SAs more effective than they are today. Because the environment is going to get more complex, and the technology is going to get more complex. Although there are some products on the outside and some tools becoming available that should make the SA function easier. Right now, every vendor sort of has his own way of doing system administration and a set of tools that apply only to the systems that they provide. But there are products coming out now that will sit on top of, and work for, a variety of different systems. I know J3 is looking at some things now whether we can take advantage of some of them remains to be seen.

Do you envision the average analyst having multimedia access at their desk?

(FOUO) Well, I don't know about the average analyst, but yes, we do envisage analysts having multimedia capability. In fact, we're in the process of coordinating a multimedia Project Baseline Summary (PBS).

Now it's not clear that NSA at the moment is funded at a level that can support that to the degree we think is really necessary. But we've put together a PBS and the new information-exploitation funding category is looking at that very hard and has defined a couple of what we call over-guidance packages to try to get more money to build up the infrastructure support.

(FOUO) A little bit of a digression: another one of the recommendations of the [_____] Study was that once the Opposition was established, one of the things it needed to be given was enough financial control to put some teeth into the CIO function. In line with that, the categories involved with the ADP areas— the analyst production, the language exploitation, and the dissemination categories—have all three been put under the CIO. The analyst production and the language-exploitation have been combined into single category called **Information Exploitation**, and it's that one that's sponsoring the multimedia initiative. (The CA community still has their own funding category and they fund their own ADP, so that's not included.)

Doesn't multimedia require tremendous amounts of bandwidth and storage?

Video-teleconferencing is another capability that some see as absolutely essential and others see as merely a frill.

(U) I think teleconferencing can help a lot but it's not the complete solution. I think there are times that sitting together face to face to work out things is the right way to do it. So I wouldn't be one of those that say that the future of communications is that everybody will stay at their desk and just teleconference. And again, teleconferencing requires a lot of bandwidth.

So we're not just talking about saving TDY money.

(FOUO) No, in fact, I know Q looked at that, and concluded that the amount of money it would take to set up a reasonable teleconferencing capability would fund a lot of TDYs. So it's not like you can take a couple of TDYs' worth of money and set this up. Even if you could easily switch the money from one pot to the other.

You mentioned information exploitation; what other areas related to that have you gotten involved with?

(D) I'm amazed everyday at the things that the CIO gets involved with! I think since the position's been established it's been a target of opportunity.

(D) One of the primary objectives I have is to encourage teaming both within DDO and across organizations, especially DO/DT, but wherever appropriate. With the kinds of things that NSA now gets involved with, everything doesn't always fit nicely in an organizational structure, and we can't afford to reorganize every time something changes, so the current philosophy is to try to form teams to work issues and solve problems and work projects wherever possible and that's something that I'm encouraging people to do. I'm mentoring several different efforts that are using that approach and people have come to me and said, "We are working with some people in this other organization outside ours; here's what we're working on, but we don't know where else to go, and the CIO seems like an appropriate place to start, so can you help facilitate our project?" So I've taken on a couple of those to help facilitate cross-organizational cooperation.

(D) One of the things that I think in general NSA doesn't do a very good job of, I find after discussions with the A/DDT, is that we don't plan well for success. By success I mean once we come up with a good capability, either developed in-house or perhaps brought it in from the outside, we're not very good at figuring out how to make it available in a broad way in the agency. We'll take it into one organization, put it on some analyst desks and say here, maybe this'll help you out, but what if we wanted to deploy, say 5,000 of a successful capability? We just don't do that very well. We'll bring things along to a particular point and then not do a good job of making it available in a timely manner and conducting all the associated training.

Do you mean in the sense of acquisition, or in the sense of disseminating the information that a capability is available?

(D) I think all of the above. How many times have you found out about some neat thing from somebody who said, "the guys downstairs bought this up and put it on my desk and boy, is it nice." And you say, well, why doesn't everybody have this capability? We just aren't geared for deploying things in a significant way when they're successful.

This is a cultural problem, too, isn't it? For instance, computer support people might say we don't know how long it would take us to learn this, so we don't know whether we can sign on to support it.

(D) Yes, that's part of it, too. We don't always fund for it, we don't always consider what's going to have to be in place if a project succeeds, so we don't plan for the training that might be needed for people to take advantage of it. Sometimes we depend on the developers to show their product around.

So we need to do a better job of marketing.

(D) We do. We need to plan *early in the process* for how we deploy if we're successful. I think there have been some very valuable things developed here at NSA that are not as effectively used as they could have been, not as broadly used because we have not done a good job of deploying them.

Are you involved with any of the process re-engineering efforts currently underway?

(FOUO) I'm mentoring the ⬚e~ effort. If you're not familiar with ~~ba back me up a little and give you some background. DDO some time ago defined its three core processes as *acquiring data* (collection), *adding value to data* (analysis), and *reporting* (dissemination) to the customer. ⬚ was an effort that looked at the reporting side, a core-process review of the systems and processes involved on the reporting side and how to improve, and to consolidate systems. They defined a single reporting vehicle that all reporters would use so that you wouldn't have "prep" in one organization and something else in another group. ⬚ is the consolidated reporting vehicle.

(FOUO) ⬚ is the core process review of the analysis function within DDO. While the boundaries are a little bit fuzzier, it incorporates everything from the collected data until you get ready to start the reporting process. The ⬚ team has representation from throughout DDO and DDT. They've

been operating now for several months, and are hoping to finish their process review this fall, but again, they're looking at all the processes involved in the analysis function and the systems involved, looking for opportunities to re-engineer and consolidate, they're looking at and trying to define the legacy systems and the migration systems for two reasons: one, for internal NSA purposes—that is, which legacy systems do we want to stop putting resources into, and which are the systems we want to migrate to, that is emphasize and build to for the future. This is being done both for NSA purposes and because at the DoD community level Intelligence Systems Board (ISB), there's an effort to do this across the intelligence community agencies. Each agency is being asked to define its legacy and migration systems. These will be looked at across the community and certain agencies will be given the lead to define the "best of breed" migration system in a particular area. They will get funding to proceed and provide that capability for the community. The implication of this is that those systems determined to be legacy systems will have money taken away from them and provided to the agencies which have been asked to lead the charge with their migration systems.

Are you involved with INTELINK?

(FOUO) Yes, INTELINK in a sense is the intelligence community's migration system of dissemination, since it's been determined that all agencies will use INTELINK for dissemination.

What is the value of NEWSMAGAZINE? Is this something you think every analyst needs a connection to, or is that the sort of thing that can be limited to staffs? I know some people think of it as "bells and whistles."

(D) I think at the moment it certainly isn't necessary for everybody to have, but I think there's potential there, as we make more and more presentations, briefings, etc. available on NEWSMAGAZINE. Especially when we're split up among buildings, it's very hard to get people to get up from their day-to-day work and go to various presentations. As our infrastructure can support more of this I think we could use it more for desktop training. Even if it's not available on every analyst's desk, if it were at least available in a number of places scattered throughout, people could just go down the hall to a conference room—that would be helpful. There are many occasions when I'll see a briefing or something advertised that I'd be interested in but then I hear it's over in

the R&E building, and adding the travel time makes it hard to squeeze into my schedule.

What about things like Internet access? Which you find preferable as far as efficiency or anonymity: bringing Internet newsgroups into the agency or encouraging people to go out on their own?

(D) There are a lot of thorny issues here. Ideally one would like people to be able to go out onto the Internet on their own; there's certainly a wealth of information available—I've attended a couple of briefings where people have talked about very significant things that have come off the Internet—but I think we have to be very careful in how we approach it for security and anonymity reasons. The kind of things that we're capable of doing in networks and so on, you assume other people could do if they really wanted to.

Net exploitation good old TA term.

(FOUO) Right. But I think there are people at the agency right now looking at the whole picture of what our policy should be with the Internet, and I think we will arrive at something that's a compromise between everyone going his or her own way and the opposite extreme, which would be one office, such as E3 (the open-source authority) being the only one permitted access to the Internet and everyone else would have to submit requirements to them. I think the open-source people will have the capability to go out and do research for us, but I think we will also have the ability in a well-defined, structured way, for analysts to go out and find information on the net. There's no replacing the ability for the target analyst who has the ability to follow threads through the net and find out information. But I think we'll have to have some well-defined procedures on how that will happen so that we don't make ourselves vulnerable.

What do you hope to have accomplished by the end of your first year in office? Have you any very definite goals yet?

(D) I guess my goals would be to have made a significant improvement in changing the culture to more of a teaming culture, having organizations think more corporately, rather than an organization coming up with, say, "the Alpha-123 organization's standard or policy on such-and-such," to think in terms of "OK, we think there's a need for such a standard or such a policy, we'll

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take the initiative to get it started but let's try to work it as a corporate issue, at least develop it in such a way that it can be built to be a corporate-level vehicle.

Get rid of the culture of "that's not how we do it in Alpha 789."

(U) Yes, and I'd like to do the same thing for when an organization sees the need to develop a capability. They should try to think, "Is this something that has broader applications so that we can develop it not just for our own little component but where else do such a need exist? Maybe we can form a team with people in other organizations." I think some of the forums that I've tried to put in place for sharing information like the ADPX will help facilitate this.

(U) Another thing I was hoping to accomplish is to make somebody in defining some of the standards which can in turn define our environment. That, as I mentioned earlier, will help us take advantage of technology but it will also make us more efficient; it allows the developers something to use to provide uniformity across the agency. For example, the GUI standard. The

graphical user interface (GUI) standard is something that now is being coordinated agency-wide, although we haven't officially promulgated it yet. It's been fully coordinated; the only thing left is to decide whether it should be a standard or a guideline or a manual, i.e. how are we going to promulgate it. But it is now accepted as an NSA standard, and that's something that every project should pick up and use. They should be able to give it out to contractors and tell them to comply with this NSA standard. So it makes us more efficient and it makes the developer's job easier. And it certainly makes the users of the systems more efficient and comfortable when they go from one system to another one software capability to another; it makes the learning curve a lot easier when, say, the exit button does exactly the same thing on all of them.

Maybe the HPW-3 contract won't be with the company that has five different keyboards.

Yes, the number of keyboards has always been a problem at the agency!

KΛ

And speaking of information...

Tech Trend Notes publishes a Calendar of Events sponsored by NSA, academia, and professional associations. Here's a sample of what's happening this year:

Event	Date	Location	Where to call:
DoD Database Colloquium '95	29-31 Aug	San Diego, CA	(703) 631-6125
Information Superhighway Summit	11-14 Sep	Santa Clara, CA	(800) 225-4698
European Conference and Exhibition on Optical Communications	17-21 Sep	Brussels, Belgium	(44) 132 266070
Electronic Data Interchange for Government	18-21 Sep	Washington, DC	(301) 445-4400
17th Annual Satellite Communications Users Conference	20-23 Sep	San Jose, CA	(800) 828-0420
C^{3}I Systems Technology Exhibit	27-28 Sep	Ft. Huachuca, AZ	(520) 452-7493
8th International Symposium on Artificial Intelligence	16-20 Oct	Monterey, Mexico	(52-8) 328-4197
OSS '95 - 4th Int'l Symposium on Global Security and Global Competitiveness	7-9 Nov	Washington, DC	(703) 242-1700
ACM Conference on Mobile Computing and Networking	13-16 Nov	Berkeley, CA	(617) 332-1101

Writing As A Continuation of Analysis

by [   ]

(U) SIGINT people would agree that good analysis is essential to producing a good report. Yet, when presented with a profoundly inadequate report, most are inclined to criticize the reporting, i.e., the writing style, the organization, the lead (if there is one), or the title. Rarely do they merely cite incomplete analysis as the problem. Almost never in such cases does one hear the computer axiom, "Garbage in, garbage out." Maybe this reflects a habit of thinking that report writing is simply documentation of a completed analysis. If so, I suggest that it is a wrongheaded habit, that finishing the report—and that alone—should be viewed as completion of the analysis.

(U) People tend to think of analysis and reporting as a linear operation—first the analysis, then the report. Even experienced analyst/reporters who do not actually do it that way sometimes describe the process in linear terms. At best, those who take the linear pattern too seriously can produce some pretty eye-glazing reports. In the worst case, they put out the things we use in NCS workshops and classes to show how good reporting is *not* done. These are poorly organized examples without leads, or with buried leads, or with titles that do not reflect the lead.

(U) Such reports did not happen just because the analyst was a poor writer. They got that way because the analyst stopped thinking analytically before beginning to write, which is the worst way to write anything. Having assembled and researched the data, the analyst neglected to apply the most powerful tool in the analytic kit, the self-critical kind of writing that forces reporters to question the evidence, recheck the premises, do more research, and often come to a different conclusion. This is what I call *writing as a continuation of analysis*. It describes a philosophy that I believe ought to become an overriding theme in training intelligence analysts to be reporters.

(U) In the past, we have trained analysts to report, almost as if it were a separate function. If, on the other hand, we defined writing as a continuation of the analytic process, we would not just teach analysts how to write reports. We would teach them that writing the report is part of the analysis—the most important part.

This approach cannot be applied to near-real-time, fact reporting, where the only questions are, "Did it happen?" and "Does it meet the criteria?" It is perfectly suited, however, to a situation in which two or more facts are subjected to analysis, research, synthesis, and judgment to report a meaningful event or discovery.

The pen is the tongue of the mind.

— Proverb found on a Thai beer bottle

Inspiration is where you find it

(U) Disciplined writing is analytic by definition. The currently accepted techniques of SIGINT Journalism conform to, and lay out a pattern for, completing an analysis while writing a report. The idea of thinking critically about what you are writing, or have written, is not new. Good writers, including good SIGINT reporters, have always done it. The point is that this is actually an analytic process which can be described, taught, and learned. Using it improves both the analysis and the writing. During the process, the analyst may discover that the data simply does not warrant a report. More often, the process will open a somewhat different perspective than the one with which the analyst began.

(U) Place yourself in the position of an analyst who has been working on a particular problem. You have done some research and pulled out some seemingly related data. Now you want to do something with it. As an analyst, you have to *organize* it, just what the SIGINT journalist has to do. You may have some of your report details, but you will need to analyze them to figure out how many of the critical Ws (Who/What/Where/When/Why/How) you have and what they are.

This will help you select, at least initially, which *organizational format* (Inverted Pyramid, Lead Plus Equal Facts, Chronology, or eclectic) you will use. It should also suggest a working lead/summary.

(U) A lead (we used to call it the SIGINT fact) is the most concise statement possible of what the report is about. Having read it, every reader should be able to make an informed decision to read on or not. Picking out a lead at this point may seem premature, but it will give direction to the analysis. Just remember that you will probably change the lead, maybe several times, before you are done. As a natural outcome of projecting your analysis into the writing phase, you will know more at the end than you did when you started. Now go ahead with a rough draft; you will not know what is missing until you lay out what you have.

They say that William Faulkner once covered the Kentucky Derby for *Sports Illustrated*. It was a beautiful work of descriptive prose that made no mention of the winning horse.

(U) Now you can start working on *thoroughness*; remember, this is analysis. Do the details support the lead? If yes, what questions are left unanswered by the details? If no, what lead do they support? Does the lead reflect what is most important in the details? If not, what is? Bang the lead against the details and the details against the lead; keep doing it with each change or addition. Focus and refocus. Expand your research. Write and rewrite. The goal is to get the lead and the details in perfect balance. That is a quick way of saying that the details should add up to what the lead says, and the lead should be a summation of the details. It is like reconciling your checkbook. If the two are not consonant, you must find out what is wrong and fix it. This may mean looking for new data, reinterpreting the data you have, or eliminating doubtful data and reconsidering your conclusion.

*Where there is a surfeit of words,
there is a famine of ideas.*

Anonymous, copied from an Air Force TLG 'Brief' @ 1980

(U) Once the report has taken shape, start tightening it up. *Tight writing* is the perfect tool for detecting the less obvious gaps in your report and exposing inconsistencies in your analysis. Fat writing works like static on a radio; it clouds the factual and covers the spurious. Tightening the narrative eliminates the static. It allows you to see what is really there. You can tell what works and what does not. Get rid of the latter, and build on the former. Exclude every word, phrase, or sentence that does not contribute. What works for you, when you are thinking analytically, will work for the reader.
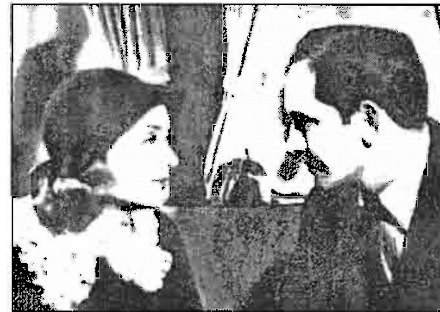
**With some customers,
the title is your only chance to score**

(U) Now review the whole report. Have you answered all the questions you can and balanced the details with the lead? Is it the right lead; does it work? If so, write your title. The lead had to be the most concise summation of the report, but the title should go even more briefly to the core of the lead, invoke the most significant element(s) in the report, and compel the reader to check the lead. With some readers, the title is your only chance to score. Finally, be sure that the title lines up with the lead and the details inalienably as they align with each other.

(U) There is no need to follow you through the necessary final edit for readability, punctuation, spelling, etc. The report is written; your analysis is done.

(U) The advantage of *writing as a continuation of analysis* is that it quantifies the analytic process. It provides a template that displays the analytic transformation of intellectual concepts into a measurable, testable thesis. That template is made up of procedures already imbedded in SIGINT journalism. Thus, it comprises a system that is already taught as the correct way to write reports.

(U) Maybe our philosophy of how to train intelligence analysts to analyze ought to embrace and overlay our method for teaching them to write reports. *Writing as a continuation of analysis* offers that kind of approach. The outcome to be hoped for would be better analytic results more clearly and cogently presented in more widely read and influential reports.

Kλ

Journalistic style, yes; creeping Clancyism, no!

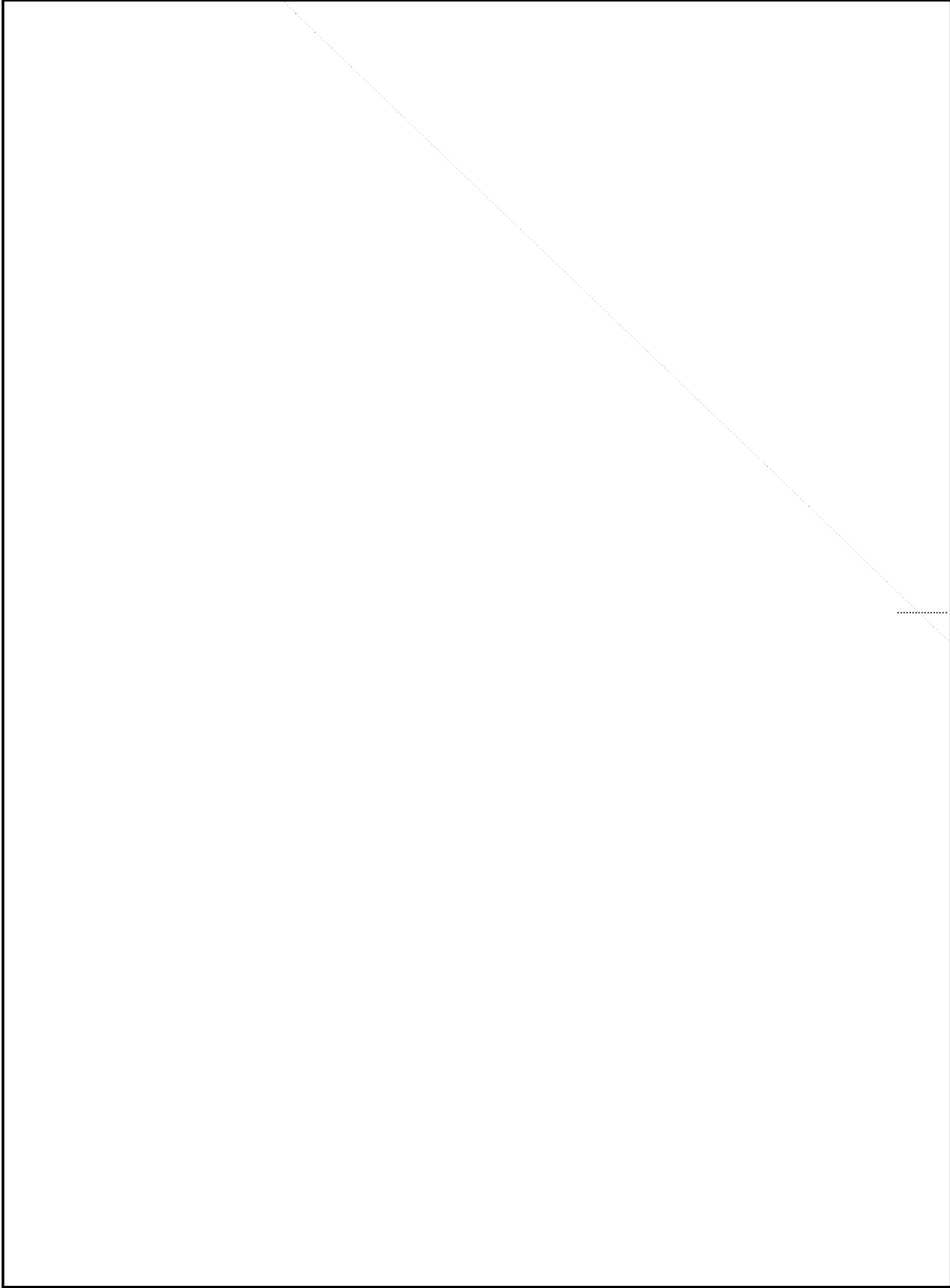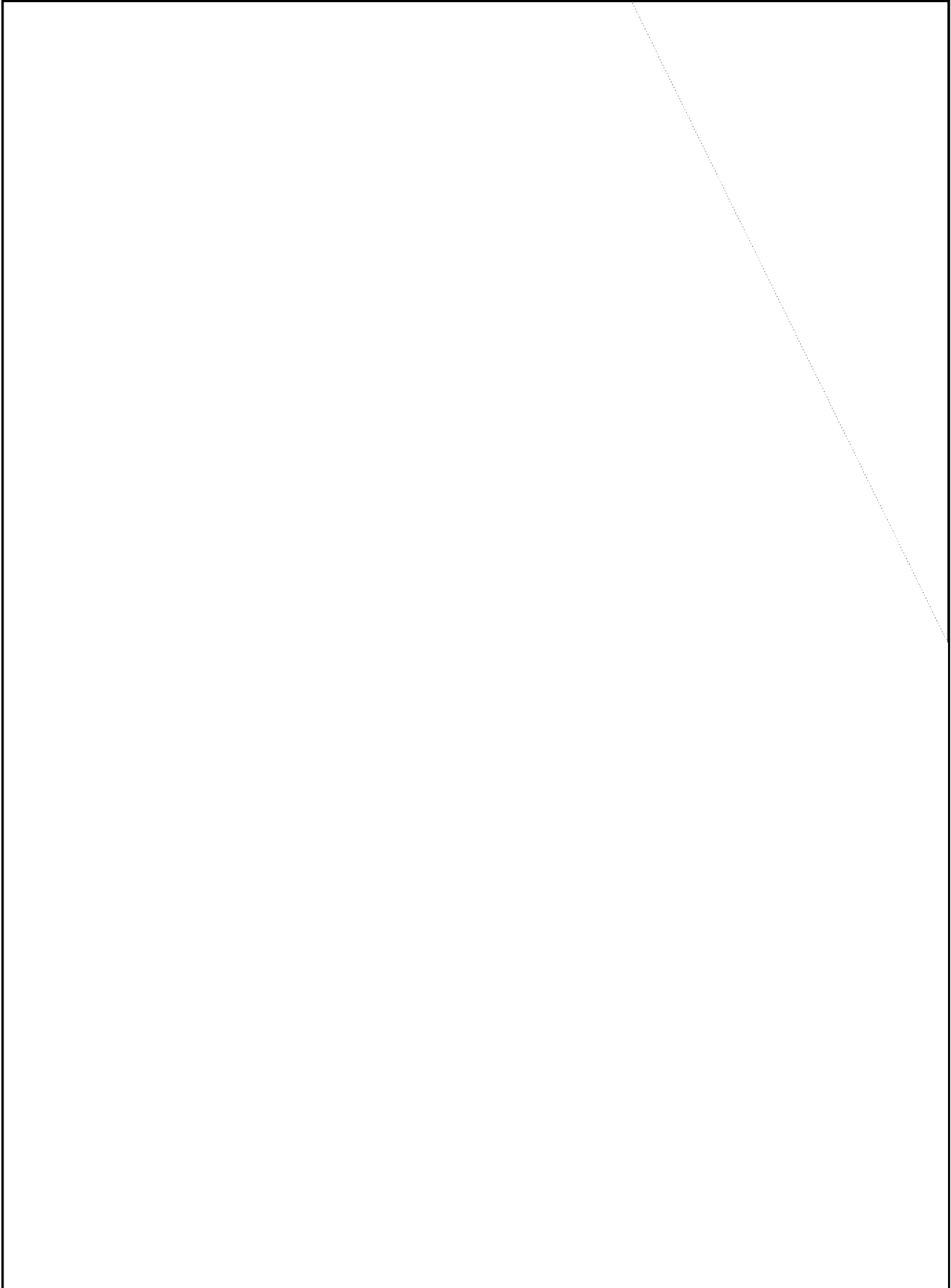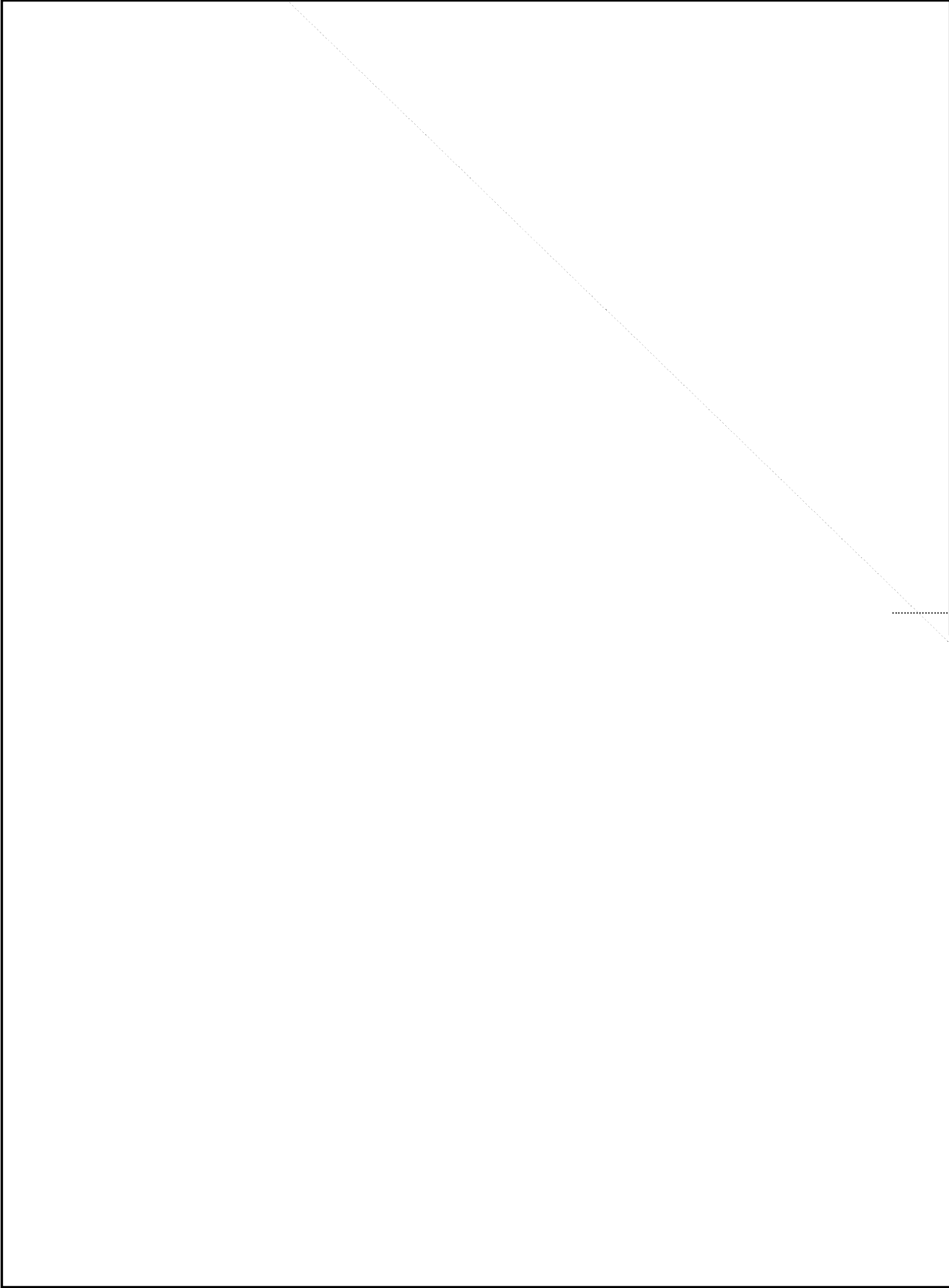by [   ] 7222

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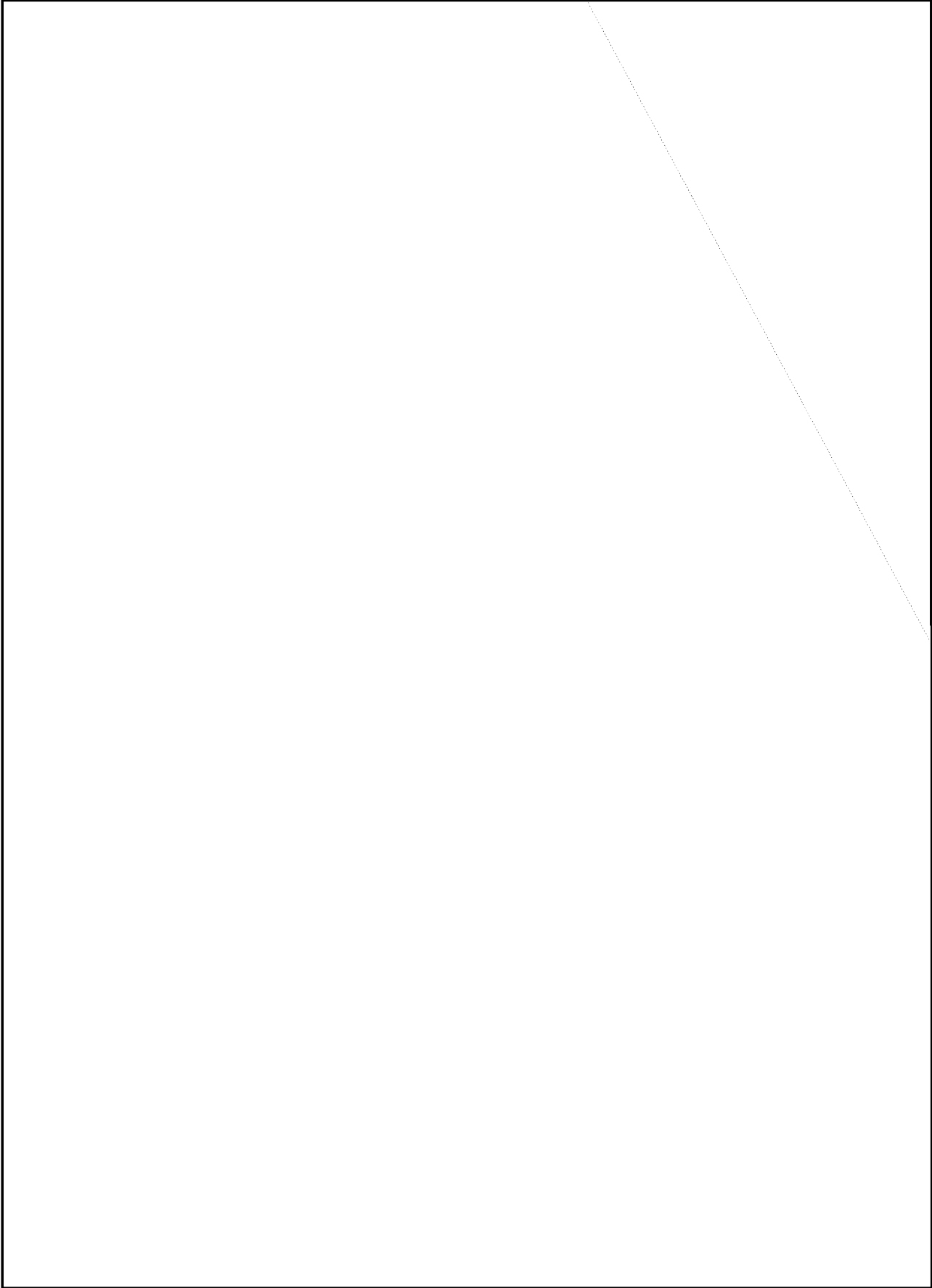
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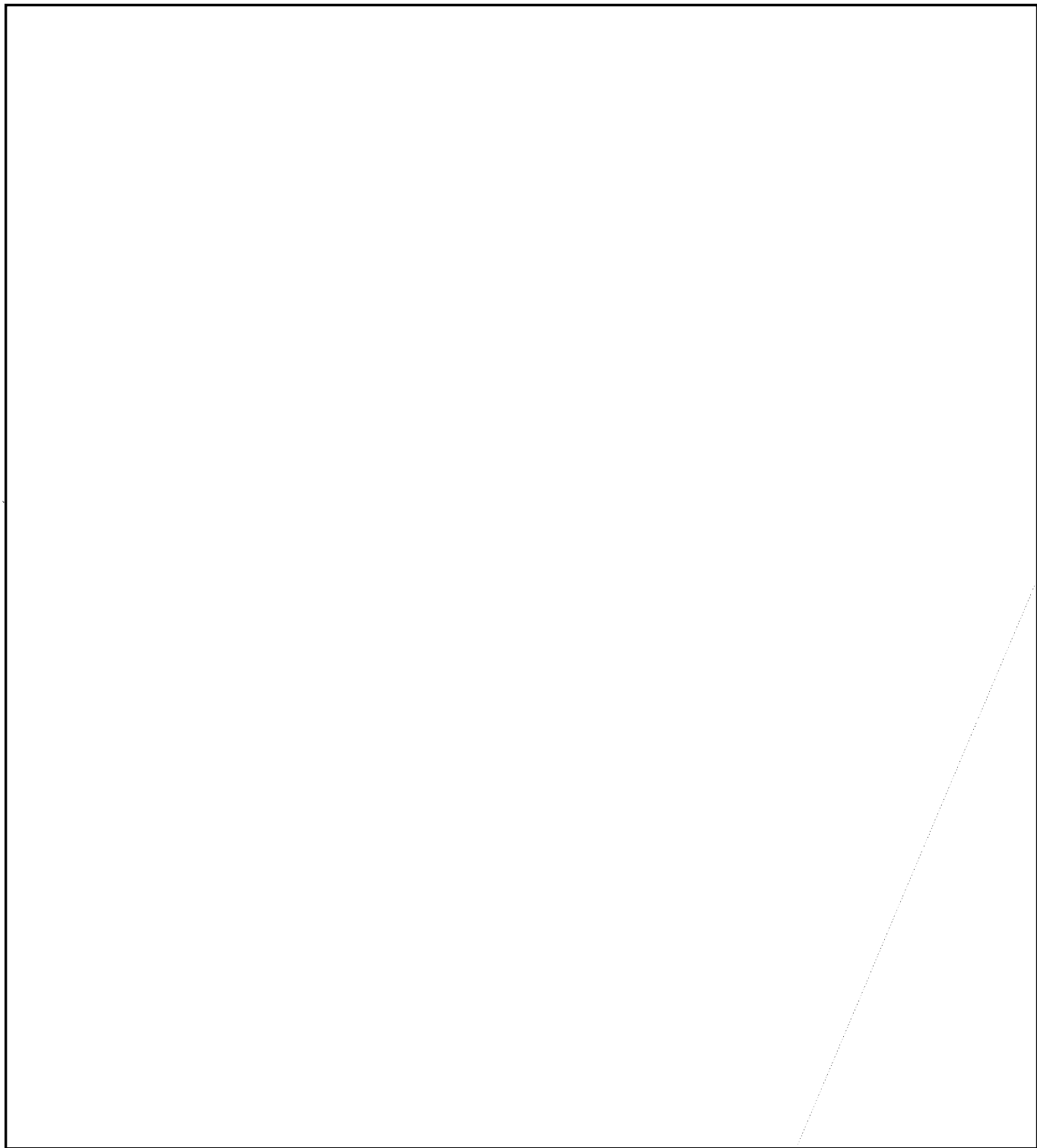
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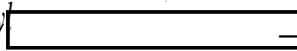Summer 1995
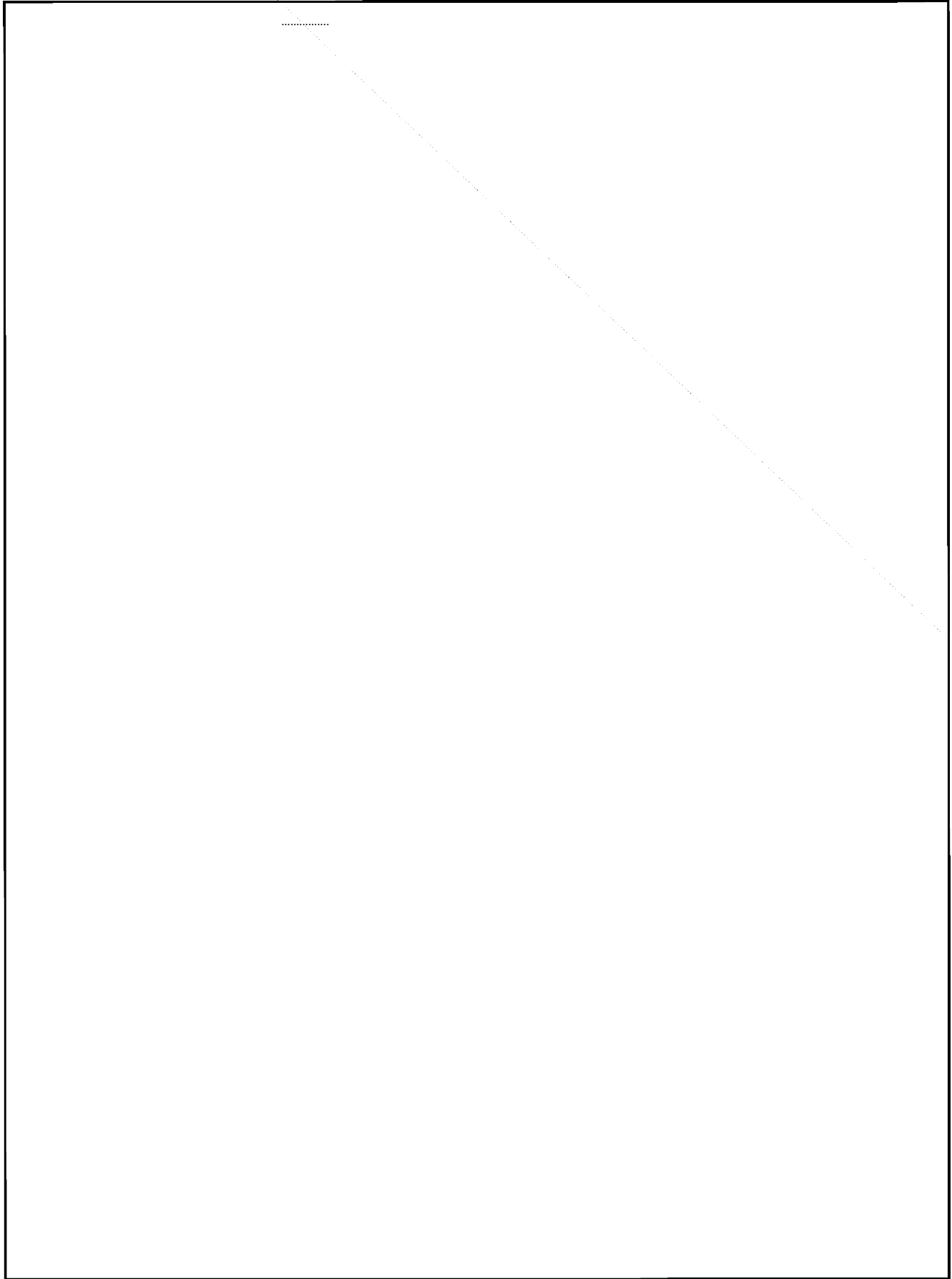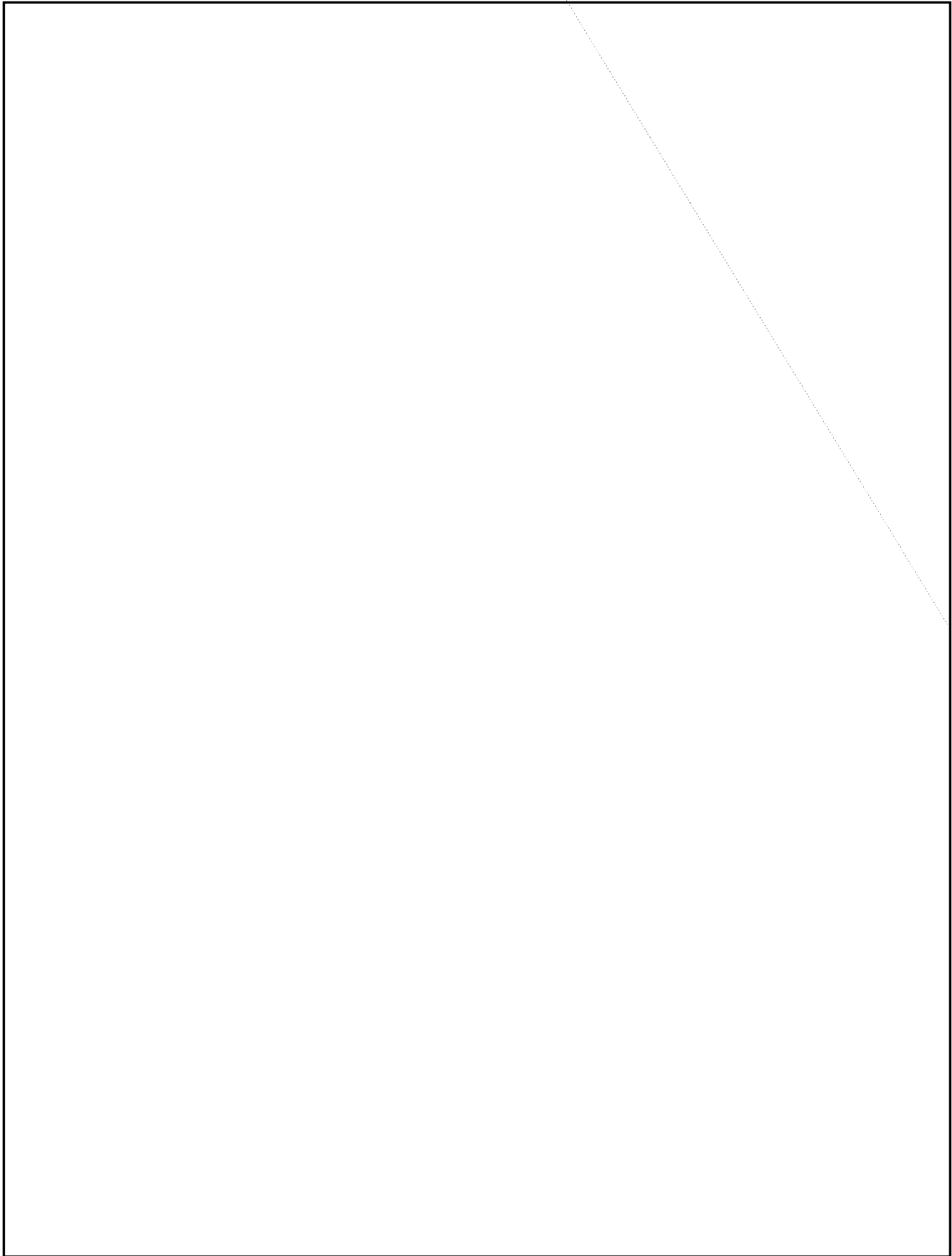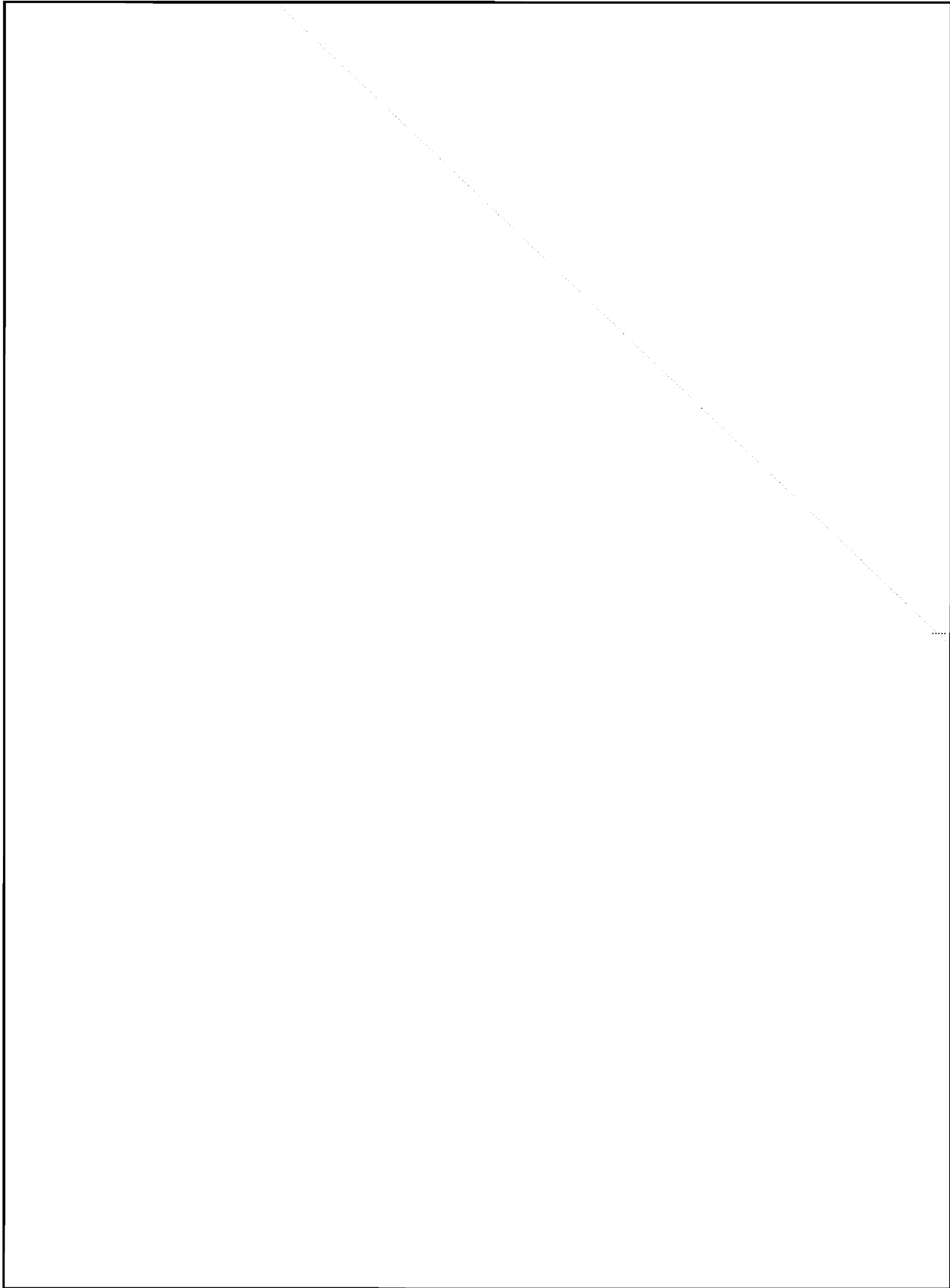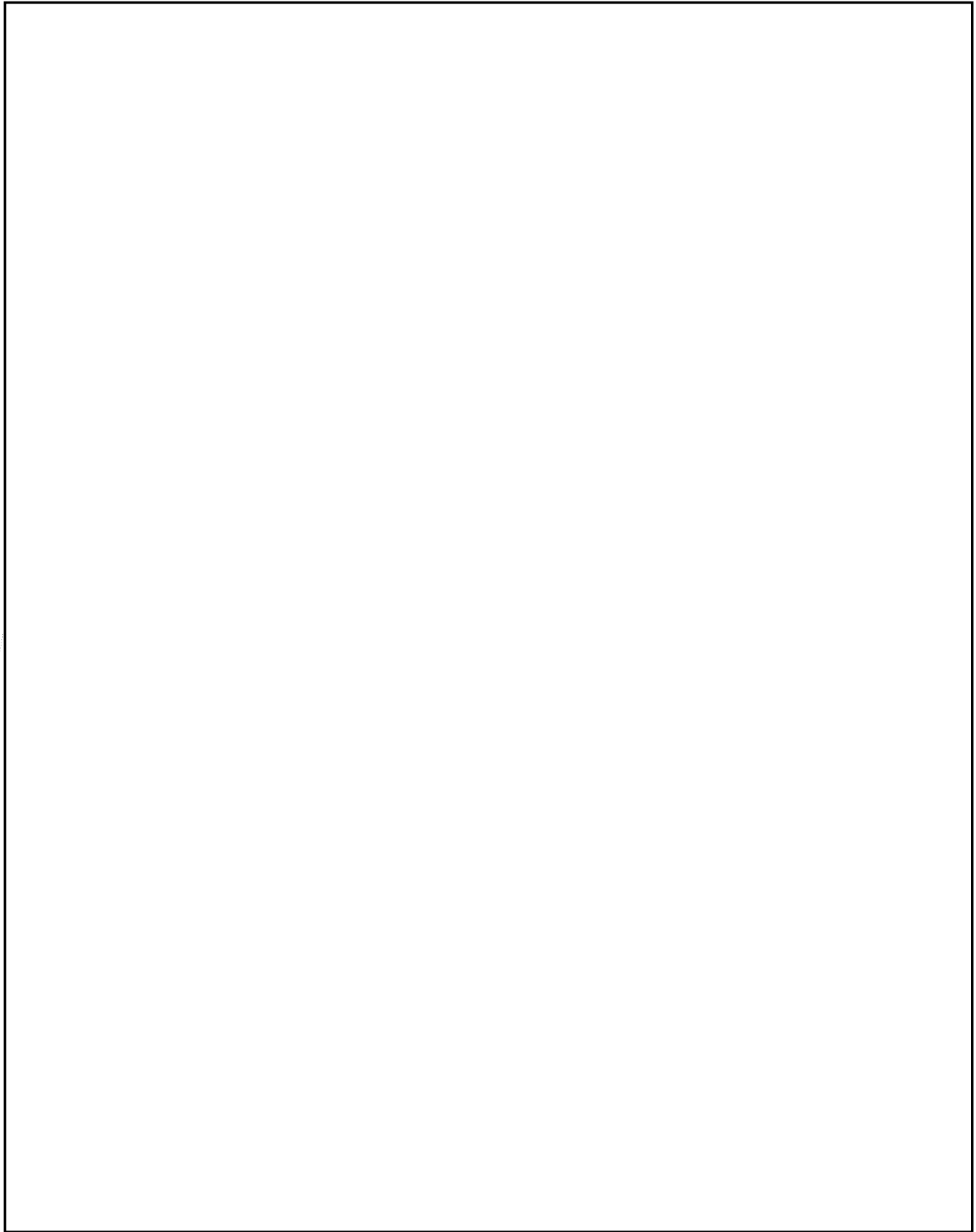
The National Information Infrastructure (NII)

by [   ] P.L.8"66366

(U) The NII is a Presidential Initiative whose purpose is to expedite the rapid deployment of advanced computer and communications infrastructure needed for a strong economy in the next century and making our nation more competitive in the international environment. According to the NII vision document, "Agenda for Action", which was published in September 1993, the NII is the seamless integration of communications networks, computers, information, and people, which will provide all Americans with the private and secure information they need, when they need it, where they need it, at an affordable price. This paper describes the background and relationships of the NII with respect to the forming of an Information Infrastructure Task Force (IITF), summarizes NSA's NII participation during the past year, and highlights some of the key NII outstanding issues from a national and NSA perspective.

Background

(U) As the focal point for NII activities, the White House Office of Science and Technology (OSTP) and the National Economic Council (NEC) formed the Information Infrastructure Task Force (IITF) in July 1993 to articulate and implement the Administration's vision for the NII. Commerce Secretary Ron Brown chairs the IITF (see Figure 1) which consists of Government senior-level representatives, three major committees, a security issues forum, and a private sector advisory council:

Telecommunications Policy Committee - formulates a consistent Administration position on key telecommunications issues, such as radio frequency spectrum management, universal access to services, network reliability and vulnerability, international perspectives related to the emerging Global Information Infrastructure (GII), legislative actions, and adequate competition among service providers.

Information Policy Committee - addresses critical information policy issues such as intellectual property rights, protection of individual privacy rights, and the dissemination of government information to the public sector.

Committee on Applications and Technology - coordinates applications and technology policy efforts to develop and apply state-of-the-art technologies in areas such as health care, government services, education, manufacturing, electronic commerce, and other applications.

NII Security Issues Forum - coordinates security cross-cutting efforts across the Committees and Working Groups of the IITF with respect to confidentiality, integrity, and availability of the information and systems carrying the information.

NII Advisory Council - as established by a Presidential Executive Order, advises the Commerce Secretary on matters related to the development of the NII. There are 37 distinguished members from industry, labor, state and local governments, and public interest groups on the Council. This body is concentrating on three main Mega-Projects: NII visions and goals driven by specific applications; NII access and universal service; and privacy, security and intellectual property rights.

(U) In conjunction with the IITF, there is a host of other Government organizations who have a vested interest in the NII. As illustrated in Figure 1, these include:

National Science & Technology Council (NSTC) - reviews and prioritizes R&D efforts across the Federal Government. The NSTC is a Presidential Council (similar to the National Security Council or National Economic Council), and it consists of nine committees, one of which is the Committee on Information and Communications R&D. The relevance of this committee is that it oversees the High Performance Computing and Communications (HPCC) Presidential Initiative. The HPCC has five R&D component areas, mainly: High

National Science &
Tech. Council (NSTC)

Committee on Info. &
Comms. R&D
Anita Jones, DDR&E
Neal Lane, NSF

HPCCIT Subcomm.
John Toole, ARPA
. Education
. High Perf. Comms.
. IITA
. Sci. & Engr. Compo

Federal Networking
Council (FNC)

Network Security
Working Group
Steve Squires, ARPA
Dennis Steinauer, NIST

Federal Wireless Policy
Committee (FWPC)

Larry Irving, NTIA
Dennis Bodson, NCS

Executive Office of the President
Jack Gibbons, OSTP   Laura Tyson, NEC

Information Infrastructure Task Force (IITF)
Ron Brown, Commerce

US Advisory Council
Delano Lewis, NPR,
Ed McCracken, Silicon Graph-

Security Issues Forum
Sally Katzen, OMB

Applications & Technology
Arati Prabhakar, NIST
. Govt Info Tech Services
. Health Info & Applications
. Technology Policy

Information Policy
Sally Katzen, OMB
. Government Information
. Intell. Property Rights
. Privacy

Telecommunications Policy
Larry Irving, NTIA
. International Telecomm
. Rel. & Vulnerability
. Universal Service
. Legislative Draft Task
Force

DoD NII Working Group
Ken Flamm, DoD

Nat. Sec. Telecom. Info.
Systems Sec. Committee
(NSTISSC)
Emmett Paige, DoD C3I

NII Task Force
Tom Burke (A), GSA
Rich Riley, Treasury

Nat. Comm. System (NCS)
Committee of Principals
NII Focus Area Team
John Okay, USDA

National Security Telecommunications Advisory Committee (NSTAC)
Industry Executive Subcommittee
NII Task Force
Carl Ripa, Bellcore   Lowell Thomas, GTE

Performance Computing Systems; National Research and Education Network (evolving into the Internet); Advanced Software and Technology; Basic Research and Human Resources; and Information Infrastructure Technology and Applications, which is directly related to the NII.

High Performance Computing and Communications Information Technology Subcommittee (HPCCIT) - plans for and implements the HPCC initiative under the auspices of the HPCC National Coordination Office. There are ten Agencies on the HPCCIT, and the NSA Chief Scientist, Mr. George Cotter, represents NSA on this panel, as well as the NSTC.

Federal Networking Council (FNC) - administers the Internet in principle and is chaired by the National

Science Foundation. The FNC has five working groups, and one of these groups, the Network Security Working Group, is addressing and formulating a security plan for the Internet.

Federal Wireless Policy Committee (FWPC) - addresses Federal Government concerns and issues on wireless communications. There are four subcommittees and a user forum, and NSA participates in all of these arenas. Wireless communications will go hand-in-hand with cable, satellite, terrestrial, and fiber optics media as conduits for NII applications and services.

DoD NII Working Group - serves as a focal point in DoD for NII activities and interests. DISA, ASD(C3I), JCS, DDR&E, NSA, ARPA, and OASD(ES) participate on this group.

National Security Telecommunications and Information Systems Security Committee (NSTISSC) - sets national policy for the security of national security systems with respect to telecommunications and automated information systems. The NSTISSC consists of more than 21 participating Agencies and observers, various working groups, and an NII Task Force.

National Communications Systems (NCS) - oversees and addresses the operations, security, and workings of the U.S. communications systems, such as the public switched network. The NCS has many working groups and an NII Focus Area Team.

National Security Telecommunications Advisory Committee (NSTAC) - advises the President on matters with respect to telecommunications, networks, national security and emergency preparedness, and other areas. Members of the NSTAC are from the private sector, and there are numerous working groups and panels, one of which is the NII Task Force.

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NSA NII Participation

(FOUO) Realizing the importance of the NII and the potential for NSA contributions, the Director endorsed an initial NSA Plan for NII participation in September 1993. A result of the NSA plan was the formation of an Agency NII Steering Group, which is led by the ADDI, to provide guidance and direction to NSA's NII related activities, as well as serving as a forum to coordinate and resolve NII cross-key component issues of importance to NSA. Similarly, the Director approved the establishment of the NII Process Management Office (NII PMO) to identify, plan for, and provide the required day-to-day focus, support, and coordination of NSA NII activities consistent with Agency mission strategies. The NII PMO originated in V8, evolved into V3, and now resides in V1, Customer Support Services. [   ] is the Chief of the NII PMO, replacing [   ] who is now Chief, V11. In addition, an NII Working Group of key component members was formed in February 1995 to assist the NII Steering Group and NII PMO address NII issues, develop strategies, and recommend courses of action.

(FOUO) NSA is also working with the National Institute of Standards and Technology (NIST) to support the Administration's NII initiatives and to implement the recommendations of the Vice-President's National Performance Review. It is believed that our national information protection strategy must not be limited to only government systems, but must accommodate other important national objectives as well: the availability, reliability, and integrity of systems which support our economic infrastructure, the protection of public safety and the provision for law enforcement, the provision for foreign intelligence, ensuring and enhancing the privacy of all Americans, and facilitating a secure NII.

(FOUO) During the past year, NSA representatives have contributed to many of the deliberations of the Administration's IITF and various NII working groups (see Figure 2). In particular, the following summary describes some of the more recent contributions to the IITF and miscellaneous NII activities:

a. **Congressional Office of Technology (OTA) Assessment** - Over the past year, the NSA NII PMO and Legislative Affairs Office worked closely with OTA to provide information, participated in various workshops, coordinated participation by other NSAers, and reviewed draft portions of a report on "Information Security and Privacy in Network Environments". A key objective of that dialog was to ensure that the scope of the INFOSEC problem was fully understood by OTA and that the issue of encryption policy, a principal focus of their report, was addressed in a balanced and meaningful way.

b. **Security Issues Forum** - NSA attends meetings as the representative of the National Security Telecommunications and Information Systems Security Committee (NSTISSC). NSA prepared a report on useful security tools and techniques; raised the level of concern and initiated a government-wide effort to increase security training and awareness of computer systems administrations; and provided substantial comments on a draft NII Security Report.

c. **Privacy Working Group** - NSA contributed significantly to working group discussions related to privacy and privacy principles. In addition, NSA provided advice on information security technologies and practices, CLIPPER, and defensive INFOWAR. As a result of our participation and contributions, we have earned the trust of the Government's privacy community and are asked to provide our perspectives on working group and other privacy activities.

d. **Reliability and Vulnerability Working Group (RVWG)** - NSA provided substantial comments on the writing of an RVWG action plan addressing network reliability and vulnerability concerns. In addition, NSA is a partner with NIST in the RVWG Protection

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IITF COMMITTEES

NSA, [   ] ····
{DOD (C3I), Emmett Paige}; {CMS, Vacant}

SECURITY ISSUES FORUM
{DOD (C3I)},
NSTISSC (NSA), [   ] ..N;
1

Applications & Tech. Policy ·· · ·····
NSA, [   ] D5;
NSA, [   ] V1 ···
{GIIS -- DoD, Diane Fountaine} ....·
Tech. Policy - NSA, George Cotter, D5;
[   ] NCSC

Telecommunications Policy NSADP[...] Esboo, Q
Rel. & Vulner. - NSA, [i   ] V1
Universal Service - NSA, [........] Q

Information Policy - NSA [   ] V1
Privacy - NSA, [   ] V1

FWPC

NSA Primary Rep. [   ] V1
NSA Alternate Rep., Stan Johnson, X2
Standards/Req Subcom., NSA, Rich Dean, R2

NATIONAL COMMUNICATIONS SYSTEM (NCS)

Committee of Principals - NSA, [   ], V
Committee of Representatives - NSA, [........], V1

NSA's NII Steering Group

[........· · · , , · ..]
ADDI, Chairman

[   ] ADDP
--O ADDP.
ADDT
George Cotter, Ch. Sc.

WORKING GROUP

NSA NII PMO (V1)

[   ] Chief

HPCCIT SUBCOMMITTEE

NSA, George Cotter, D5;
[   ] D5

FNC
NSA, [   ] T

FNC NETWORK SECURITY WORKING GROUP
NSA, [   ] V1

NSTISSC NII TASK FORCE
NSA [   ] V1;
[   ] V1, Task Leader

NSTAC NII TASK FORCE
NSA, [   ] V1;
NSA, [   ] V1

DOD NII WORKING GROUP
NSA, [   ] V1

4/7/95, Rev 5

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of the Network sub-working group, and we are helping to identify community-wide network infrastructure protection issues and recommending solutions.

e. **Risk Assessment** - Under the RVWG action plan, NSA was nominated to be the office of primary responsibility for one of the actions on NII risk assessment. In particular, this action calls for the identification of risks to the reliability and availability of NII networks and services, and it is concerned with new uses of existing technologies and uses of emerging technologies.

f. **Committee on Applications and Technology** - NSA reviewed and critiqued all of the committee's applications, services, and technology documents and

offered our insights into security needs for these emerging efforts. We also participated in a survey of NSA programs and projects which may enhance the acceleration of the NII and submitted more than 20 candidate efforts. Last of all, we participated with NIST to evaluate and offer input on the Worldwide Web NII home page.

g. **Miscellaneous Activities** -

(1) IITF - At the request of the Administration, the NII PMO recently worked with Commerce personnel to have DDI, Mr. [   ] become a formal member of the panel.

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(2) NII Security Infrastructure - NSA assisted NIST and GSA to establish a Government wide security infrastructure office and integrate NSA personnel into GSA's new Security Infrastructure Program Management Office.

(3) Federal Wireless Policy Committee - NSA chairs the Standards and Requirements Subcommittee and took the lead in writing the Wireless Standards Plan.

(4) Federal Networking Council - NSA is contributing in this community wide effort to develop an Internet Security Plan.

(5) Information Policy Committee - NSA contributed to the document on intellectual property rights principles.

(6) Telecommunications Policy Committee - NSA was invited to review and offer comments on the vision documents for the NII and Global Information Infrastructure (GII) and provide input of the Committee's FY95 Work Plan.

(7) National Performance Review (NPR) NSA is supporting OMB and NIST on at least four actions with respect to security information technology and tasked to take the lead on the effort.

(8) Briefings and Workshops - NSA has briefed key NII leaders and officials, e.g., OSTP, NEC, OMB, DoD, Commerce, GSA, OTA, GAO, etc. on protecting unclassified but sensitive information and the vulnerabilities of our national systems. Similarly, we have helped energize NSTAC members to begin to address new security/emergency preparedness issues and arranged for the State Department in providing an NII international organization briefing to the NSAG-4 Telecommunications Technology Forum.

National NII Issues

(U) Throughout much of the discussions on the NII, questions arise, such as, what is the NII, who will build it, is it here now, what do I do with all this information, and what should be the role of the Federal Government in the NII?

(U) To answer several of these concerns--the NII is already here in an elementary form. One definition that I like is that the NII is a combination of the phone system, cable systems, private networks, the Internet, video culture, wireless, direct broadcast satellites, and the information services and applications that will be

carried on these systems. Much of these media will be interconnected in Cyberspace, however, some will not. The private sector will be building and implementing the NII, while Government's sole and core responsibility will be to provide leadership in certain areas, serve as a facilitator and catalyst in removing legal and regulatory barriers (e.g., the Telecommunications Act of 1934), promote competition, provide better access to Government information, improve Government procurement and distribution of benefits, and promote policies that will support a viable secure information infrastructure for public and private institutions.

(U) Some of the more pressing national NII issues which are ongoing and have yet to be resolved include:

a. How much of a leadership role should the Government have in the definition, architecture, development, and implementation of the NII?

b. How should current Federal and State laws, regulations, and policies be changed to be more attuned to the NII (e.g., computer crime, First Amendment Rights, etc.) and the Information Age?

c. How should the "Universal Service" concept be extended to ensure that information resources are available and accessible to all Americans?

d. How will intellectual property rights be protected?

e. How will privacy be ensured and who will provide it?

f. How will information security and network reliability be ensured and who will provide it?

g. Who should develop standards for the NII and will it be interoperable?

h. How will the NII interconnect and work with the GII?

i. Is there a DoD and intelligence Community role in the NII?

NSA NII Issues

(FOUO) NSA interests in the NII appear to be multiple and multi-dimensional and encompass both the SIGINT and INFOSEC missions. Within NSA there is also an ongoing debate with respect to the following issues and concerns:

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a. How does NSA NII participation fit into the overall Agency mission strategy (e.g., Equities, INFOSEC, INFOWAR, Export, SIGINT, Computer Security Act, etc.)?

b. What are the NSA specific goals or objectives for participating in the NII? Why should NSA concern itself with the NII?

c. Should NSA interest in the NII be from an INFOSEC only perspective or should it be an Agency-wide perspective?

d. Should the NSA Board of Directors become more involved in addressing NII cross-component issues?

e. In many public meetings in which we participate, NSA takes a lot of criticism and "flames" because of who we are and what we do. If we do not have a position on these criticisms or issues, that is a position in itself-failure to make a decision is a decision.

f. Does the Computer Security Act of 1987 limit our participation in the NII? If it does, how should it be changed? What role should NSA have in protecting unclassified but sensitive information in the Government and private sector domains?

g. Should NSA only participate in the DoD Defense Information Infrastructure (DII) portion of the NII? What are the specific NSA objectives for participating in the DII and can these be applied to the NII?

h. Other Government Agencies seem to be getting more involved in INFOSEC research and development efforts. Should NSA be taking more of an INFOSEC leadership role for the Government with respect to unclassified but sensitive information?

i. What impact will the Administration's Security Policy Board/Security Policy Forum have on NSA, as well as our involvement in the NII?

j. The NII is evolving into the GII. What are the NSA interests in the GII?

k. What is the NSA strategy for using the Internet? Do we have any strategic intent into securing our Internet hosts? How do we plan to easily import information from the Internet into our internal systems?

The author would also like to thank [   ] *who recently left the W1 NII PMO, for his contributions to this paper. (N.B. The views expressed in this paper are those solely of the author and do not necessarily represent any NSA organization or entity.)*
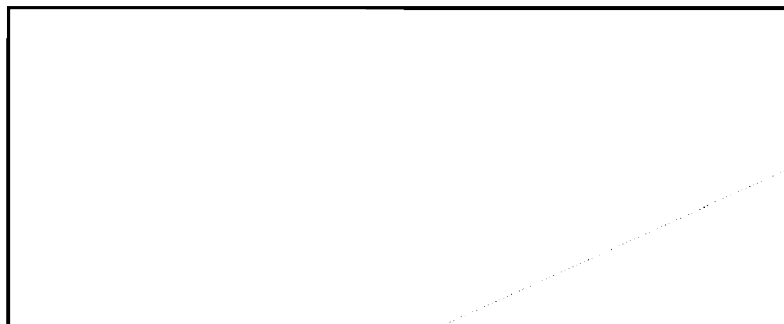
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For more information on the NII:

[   ] contributing reports on various NII-related meetings and decisions, and providing press articles on the NII. He also maintains the NII Calendar of Events, updated monthly:

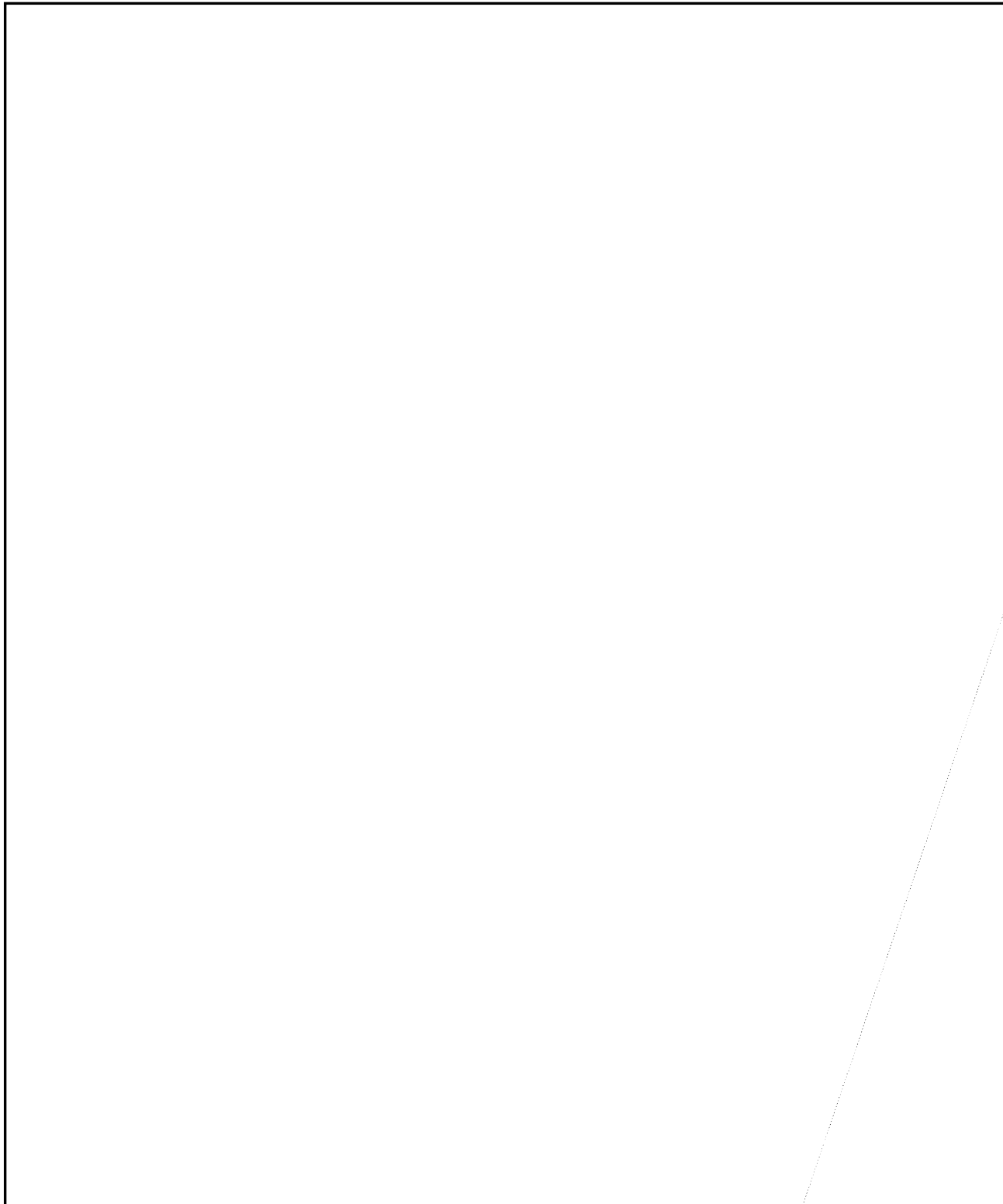### August - October 1995 (Updated 15 Aug)

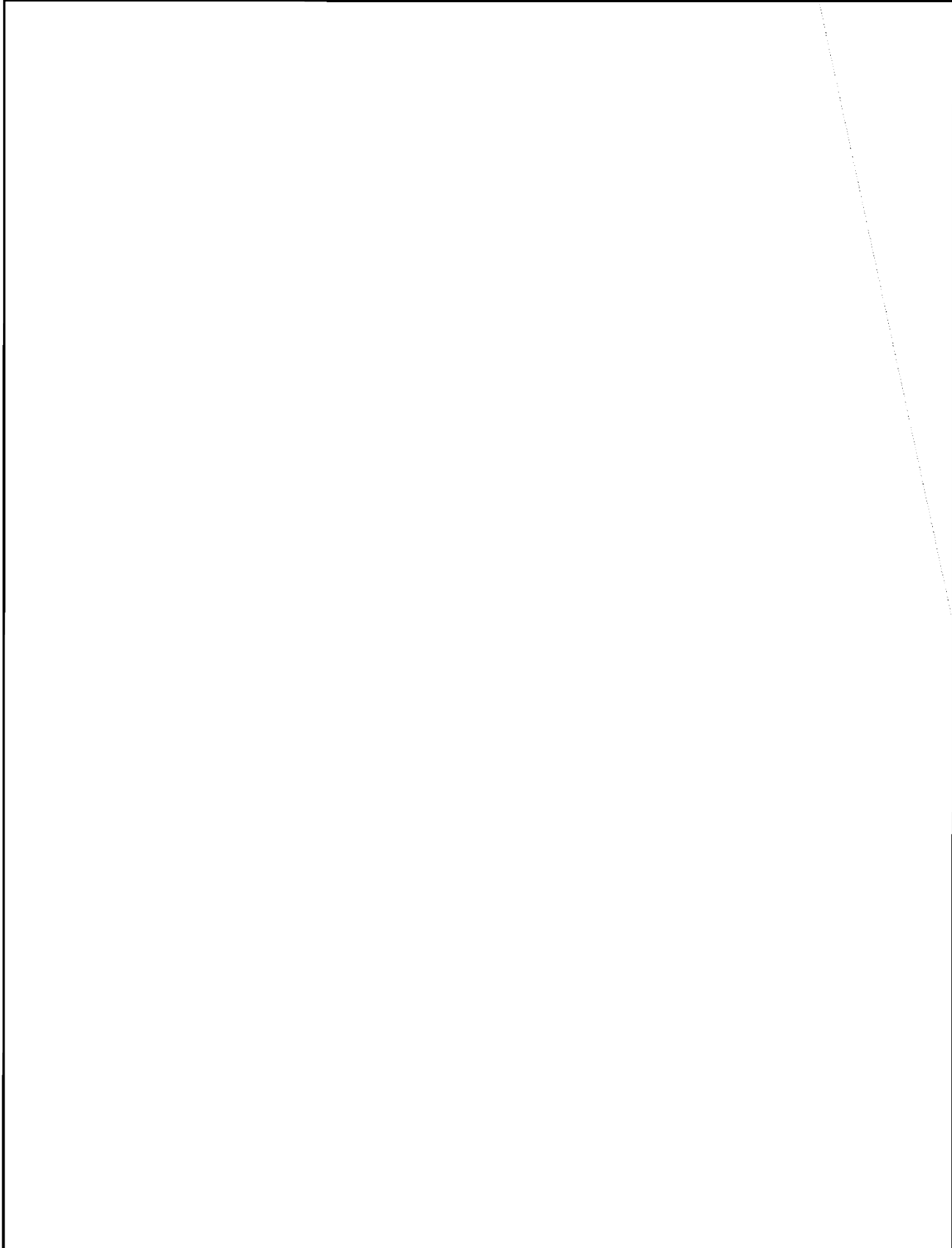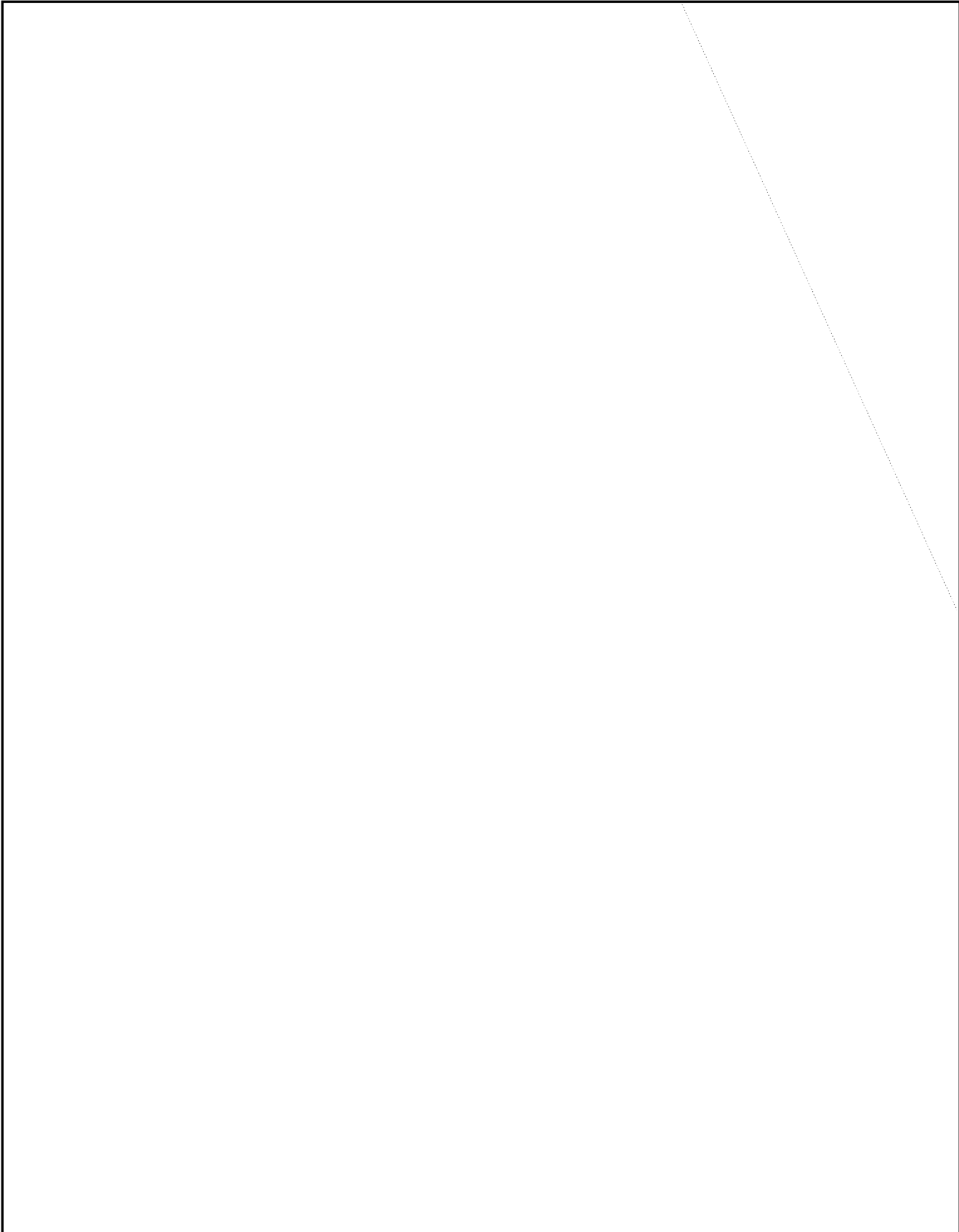|	
	15 August
	7 September
	20 September
	21-22 September
	22 September
	TBA September
	TBD
	11 October
	TBA October

What's This New Intercept I'm Seeing?

by [ ]

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The Unfocused Eye:

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(FOUO) It was the fifth of January 1993 at the Alabino All-Forces Testing Ground west of Moscow. A smiling, overcoated Russian bureaucrat in a black fur hat, harnessed with a backpack radio and surrounded by uniformed figures, was dancing up and down in the snow. That evening a few seconds of his not-ready-for-the-Bolshoj performance were shown on national Russian television news, and next morning several Russian newspapers carried an account of his comments.

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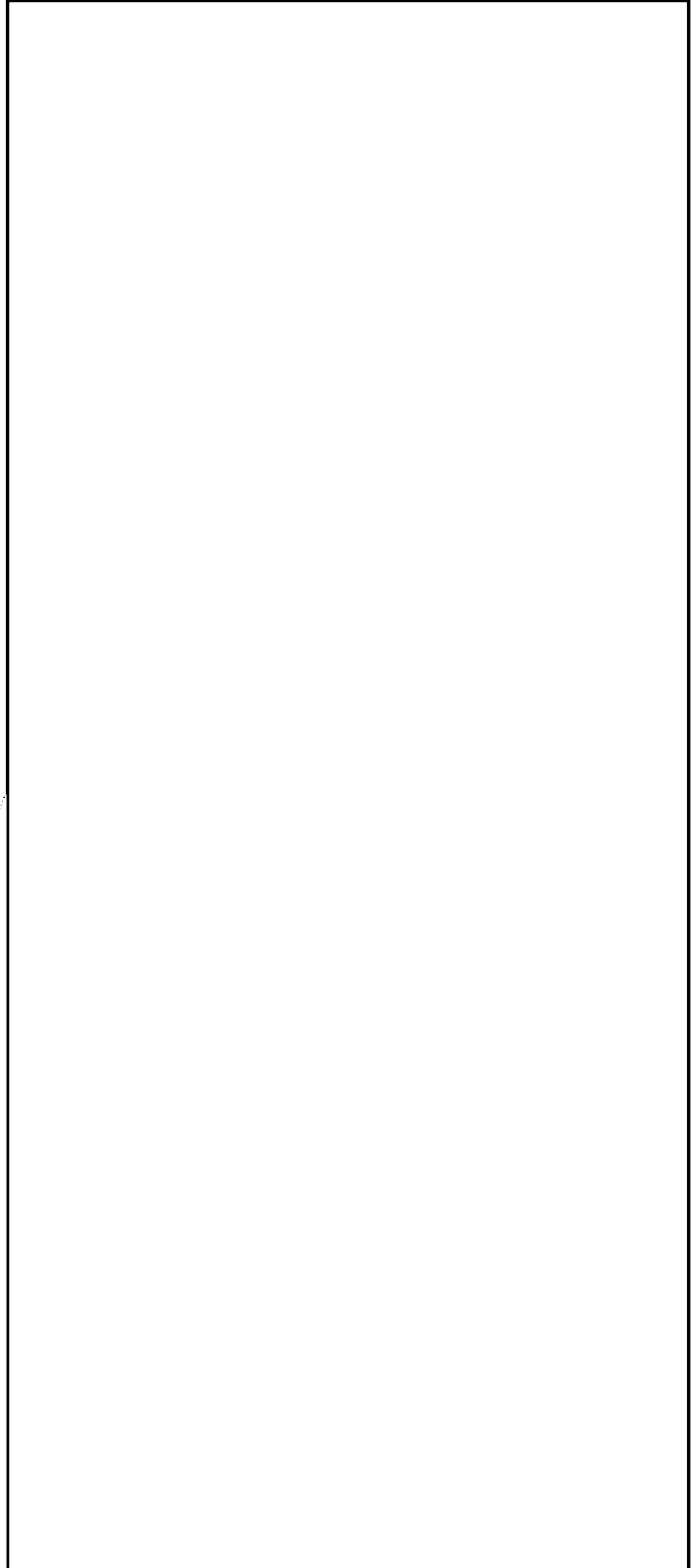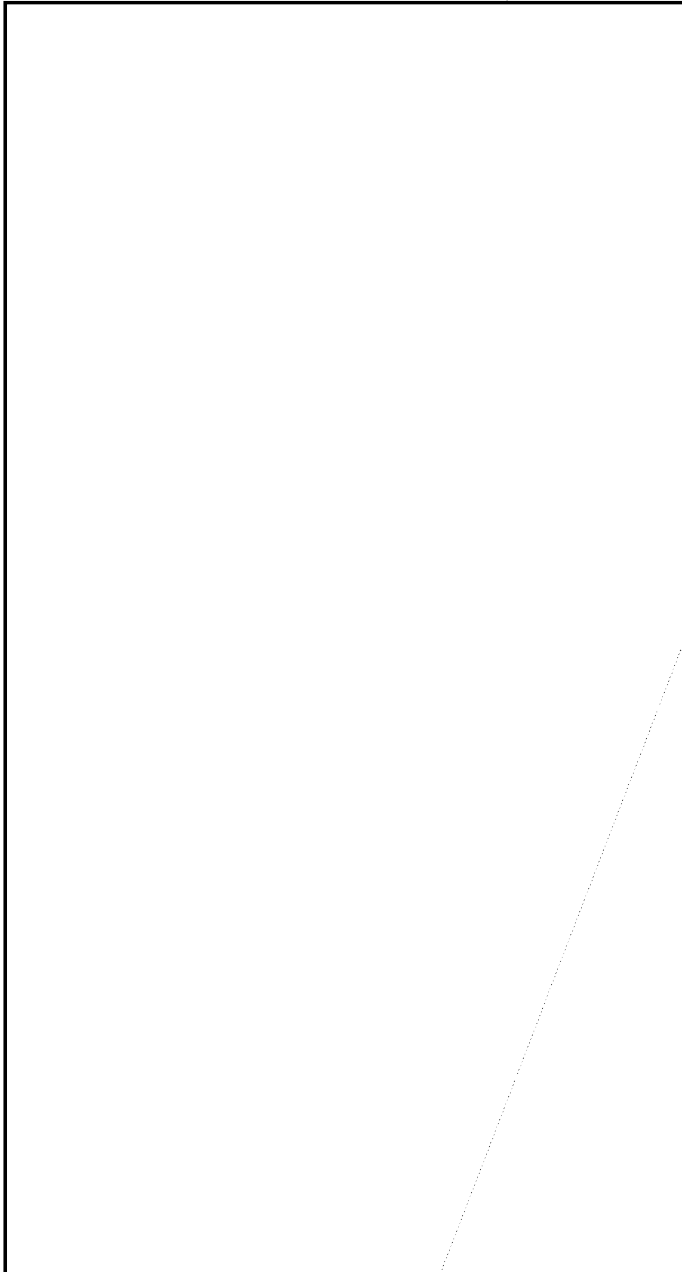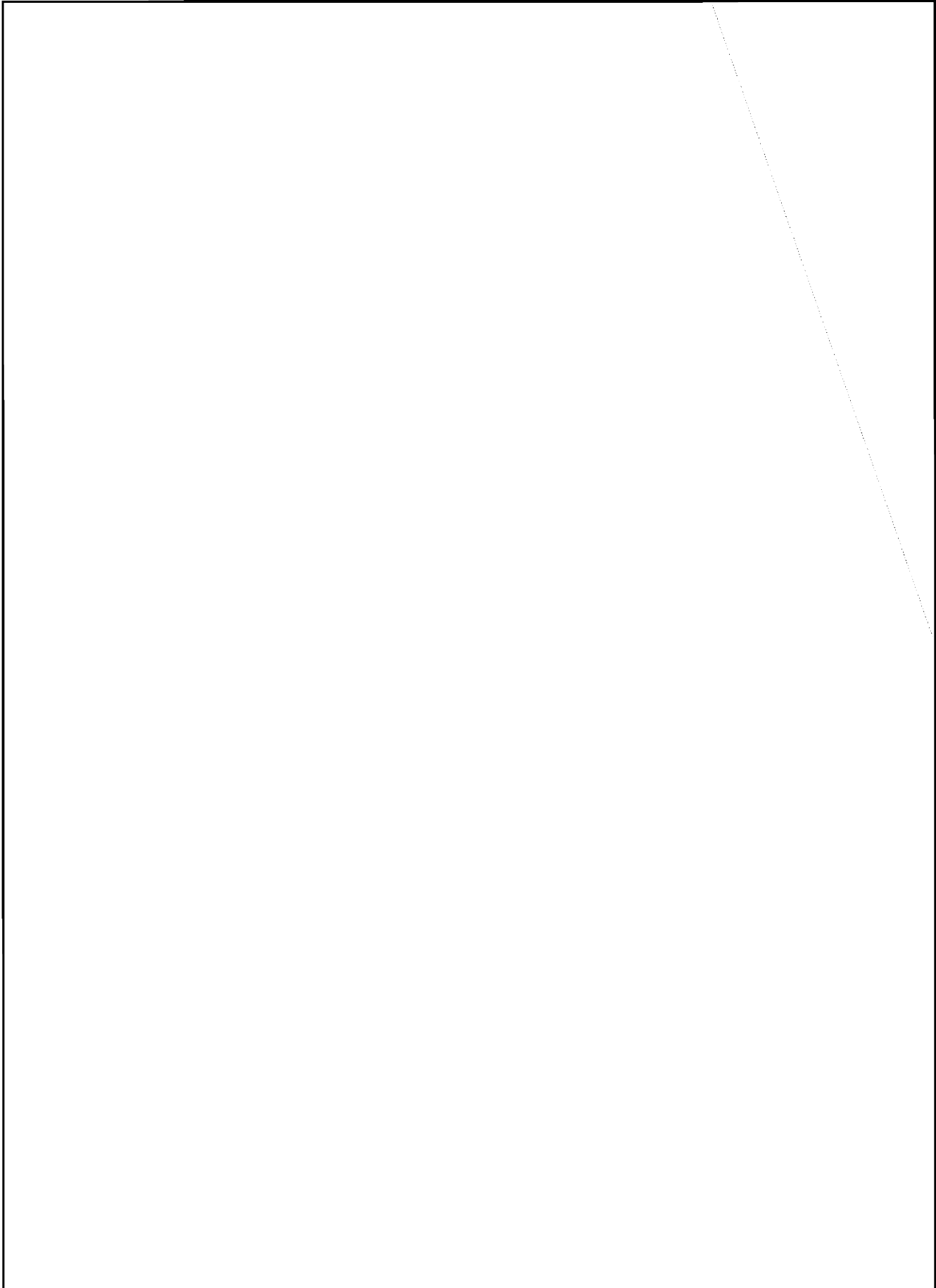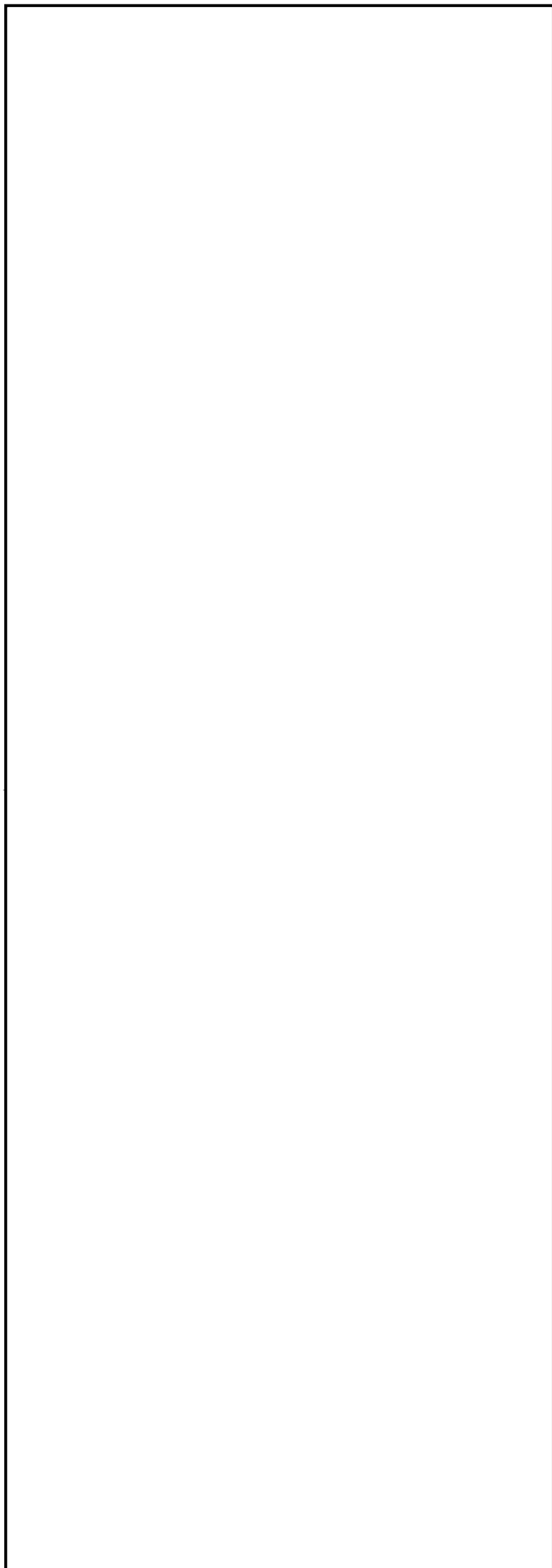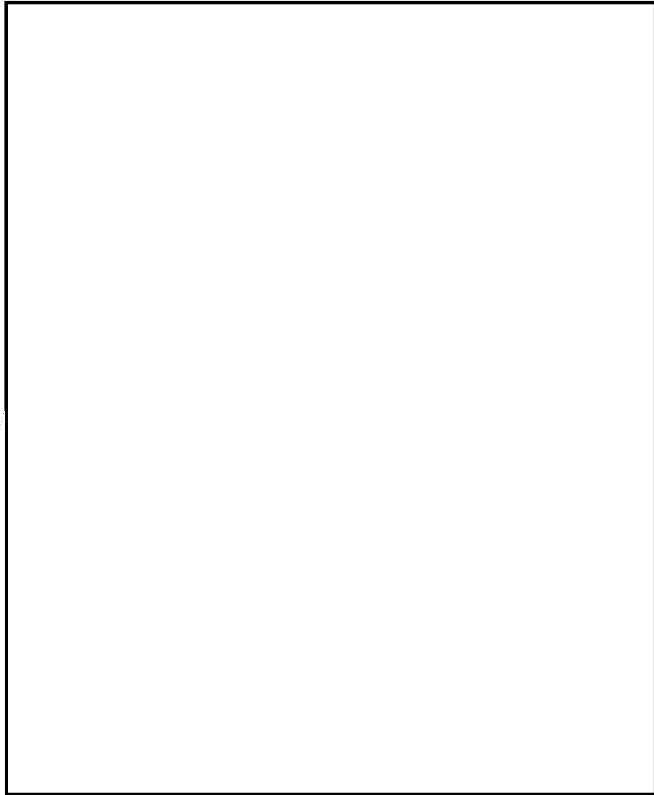
Finding Things in the Dark

(U) As a young recruit in the Navy Reserve, I was taught how to scan a sector of the sea at night. "Do not," I was sternly told, "look directly at a point; let your eyes relax as you scan across the sector, and wait for something to attract your attention." This had something to do, I suppose, with the distribution of rods and cones in the human eye, but also with the fact that the eye can focus on only one thing at a time. Once we focus, everything else becomes peripheral, and other things are not so likely to be noticed until we relax our gaze or refocus it.

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EO 1.4. (c)

From the History File:

*(U) Dr. Sydney Fairbanks, for 5 years the editor of one of CRYPTOLOG's predeces-
sor publications (the NSA Technical Journal), was, besides a cryptologist, an academician
who taught languages and sciences at St. John's and Harvard, a translator, an accom-
plished musician, and he held a number of jobs in the diplomatic and judicial realms. His
editorials, published in the NSA Technical Journal from 1956 to 1959, are entertaining as
well as informative, and surprisingly applicable today. For example, from April 1956:*

(U) The history of technical magazines at NSA is
not unlike that of the city of Troy, which was, we under-
stand, destroyed by fire and rebuilt on at least five differ-
ent occasions. This is a matter from which both
pessimist and optimist can draw legitimate inferences,
but speaking for the latter we say that the idea evidently
has extraordinary vitality, and we hope that its latest
incarnation will be welcomed.

(U) Part of this vitality may be due to a certain for-
tunate fuzziness that shelters any ideal until the time
comes to embody it. There is always the danger that
what the supporter has in mind is a journal full of arti-
cles on his own specialty which, of course, any right-
thinking person will understand and enjoy—plus a few
outlandish disquisitions on other subjects, which he
needn't read. "Even with a Technical Journal devoted to
one specialty," we are told, with perfect truth, "no one
reads ALL the articles." Unfortunately, any attempt to
edit the Journal on this basis, but without bias, would
result in perhaps five little quartets each containing
about one-and-a-half articles, and united by nothing but
the cover. It does not seem difficult to prophesy that
such a publication would fall apart. Unless at least half
our articles are interesting to at least half our readers we
shall be hardly more than a rather clumsy unofficial
adjunct to the existing system of reports.

(U) To concede or admit this, however, is apt to fill
the air with such choice missiles as "popularizers,"
"intermediate training pamphlets," "writing down," "Do
you mean a Technical Journal or a Scientific Ameri-
can?"... all of them carrying a certain bit of truth, but
shaped we believe from a misunderstanding. At least
two-thirds of the unreadability of the average technical
report is due not to unavoidable sophistication but to
casualness. An expert writing for other experts in the
field can organize his material poorly, express himself
badly, avoid deciding what his basic assumptions are,
and still be read with interest, because they can almost
unconsciously supply what is missing. To reach a wider
audience he need not "write down"; he need only write
better. If enough of our contributors have the time and
the energy to do this—and let no one underestimate the
time and the energy that it takes—we believe that we
can achieve the necessary level of general interest.

(U) As for the remaining obscurity, due to what we
have called unavoidable sophistication, obviously it is
no bar to publication. The Journal has been urged to
avail itself of the best minds in the Agency as specialists
and referees, and readers can be confident that they will
not be deprived of any article merely because the Editor
is not bright enough to understand it.

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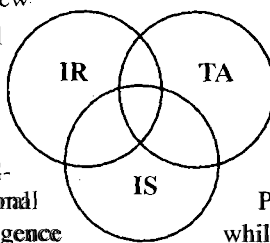
Intelligence Analysis Off-site and Open Forum

by [   ]

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(FOUO) The Intelligence Analysis Career Panel (IACP) held an off-site on 22 and 23 May 1995. In these open sessions, the IACP asked for input on several issues from the DO Group Chiefs, E1 and E3 Management, Tech Track players, interns, aspirants, and professionalized Intelligence Analysts. The panel reached several decisions about where the IA Career Field needs to be going, the need for corporate participation in and understanding of IA, and the necessity of involving the IA technical population in reaching decisions about the health and future of the career field. The most significant decision of the off-site was to rebuild the Intelligence Analysis Career Field around the "pillars" of Intelligence Research and Reporting (IR), Traffic Analysis (TA), and Information Services (IS). Professionalization criteria will be adjusted to reflect this orientation. After acquiring a strong base in the aspects of the career field that are common to all three pillars, individuals will focus on one of the three areas. With the help of the appropriate senior managers, we will be guiding individuals toward those skill areas which are in particular demand. After the proceedings of the off-site were published [   ] the panel felt it was necessary to hold an Open Forum to give people the opportunity to listen to the results and recommendations of the off-site and to make any comments or suggestions, voice concerns, or ask questions. The Open Forum was held in the Friedman Auditorium on 11 July; a summary of the question-and-answer session is included here.

I. State of the IA Career Field

(U) In opening remarks [   ] reviewed the incentives that prompted the off-site. Over the past 6 months, a major subcommittee of the IACP had been meeting to perform the periodic review of the IA criteria. During the review, several issues repeatedly surfaced that could not be resolved in the regularly held IACP meetings. In addition, the IA Tech/Track Review Panels (TTRPs) had been having some difficulties evaluating applications that fell outside the traditional realm of the IA predecessor fields of Intelligence Research (IR) and Traffic Analysis (TA). These problems needed immediate, concentrated attention, hence the decision to hold an open off-site that would bring all the major players together.

(U) For the sake of those that have either forgotten or never knew the reasons for the merger of the IR and TA career fields, here is a review of the start and subsequent progress of the IA Career Field.

(FOUO) In the late 1980s, several groups (Project Reload, the Blue Ribbon Panel Studies, the Future SIGINT Capabilities Study, and the M4 Future Skill Mix Study) concluded [   ] [   ] Furthermore, there was a need to develop future analysts/reporters with broad-based fundamental SIGINT knowledge supplied with a higher level of analytic skills. The major initiative that resulted from these studies was the creation of a new career field for

analysis and reporting. This decision was concurred in by the DDO Group Chiefs, the Chairs of the IR and TA panels, as well as DDO, DDT, DDA, and the Director. A Transition Panel was established in February 1988 with members from the IR and TA Panels, representatives from Policy and Career Development organizations in M, and the NCSS. This panel worked closely with all parties affected by the change. It purposely moved slowly and deliberately to make sure everything was right! The IA Career Panel was established in February 1990; while the Career Field itself officially came into being in January 1991. The first Intelligence Analysts were certified in the beginning of 1993.

(FOUO) By 1993, the IA career field had been around long enough that the IACP was ready to make some judgements about its strengths and weaknesses, or perhaps its advantages and disadvantages. One of the significant conclusions at the criteria review conducted during 1993 was that it was unrealistic to expect aspirants to get through the dozens of NCSS courses required for certification. This prompted the IACP to strengthen the core courses with the aim of creating a "journeyman" at professionalization, and of eliminating the requirement that an aspirant specialize in one of the IA skills. The IACP, however, continued to emphasize the need to pursue additional training which would serve to reinforce or develop one's expertise in one of the core IA disciplines (i.e. specialization) and, accordingly, developed a post-professionalization program—the Agency's first such

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program--which provided a structure whereby analysts and their supervisors would meet with an IACP executive to develop a coherent "continuing education" plan after certification (additional details are available in the Panel office). Also at this time the names and definitions of some of the IA skill areas were clarified
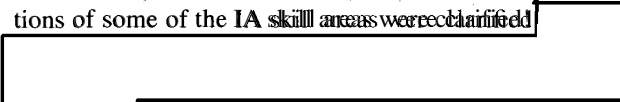
Other new programs that have been developed over the past two years have been the IA portion of the Agency Technical Track Program, the IA and Agency Cross-Training Programs, and the newest one, the Skills Enhancement Program.

II. What is Intelligence Analysis?
Is it serving the needs of the Agency?
What needs to be done next?

(FOUO) During the off-site, the IACP often found itself discussing the question, "What is IA?" The fundamental conclusion was that IA is a diverse, broad field made up of analysts with a variety of skills and assets. *This breadth--although often difficult to describe-is is its greatest strength.* A summary of other actions and recommendations follows:

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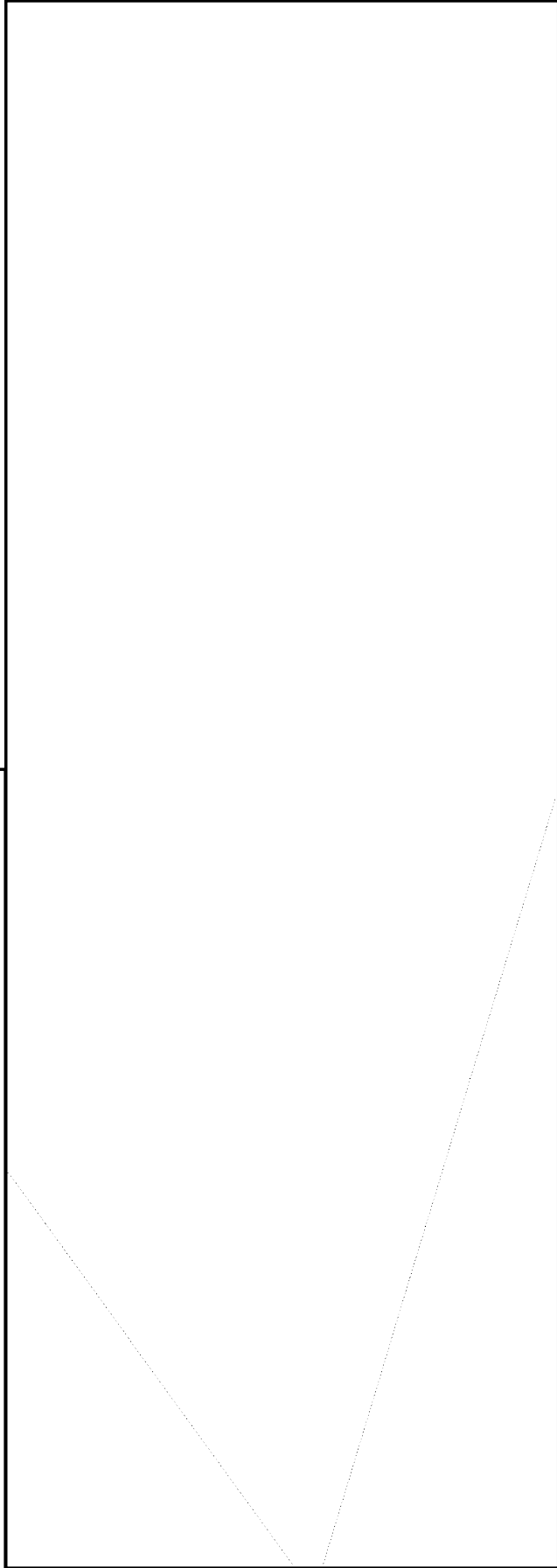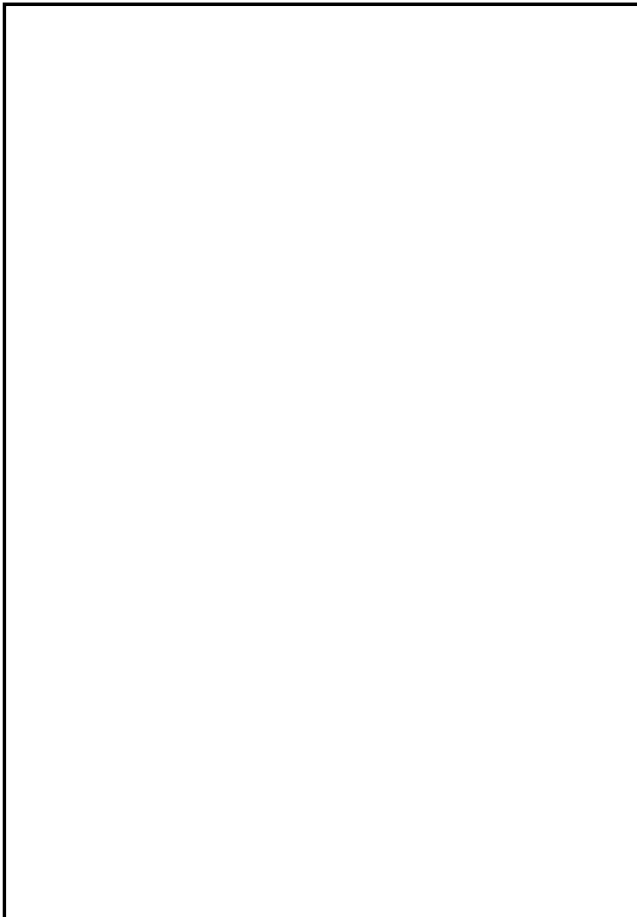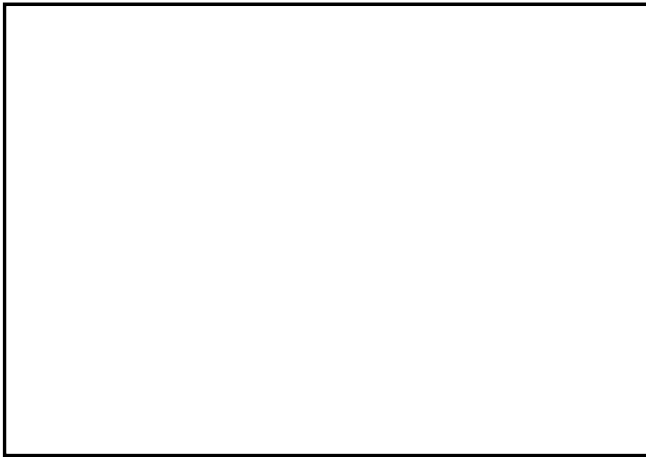
III. Assessment of the IA Tech Track

" (FOUO) The TTRPs have found several significant challenges as they have conducted the peer reviews of Tech Track aspirants. First, their job is made more difficult by the breadth of the IA career field. They are concerned for those on the periphery of the IA world: the staffers, those working primarily in ADP as it relates to IA, those who might be more connected to the signals aspect of the IA skill area of Signaling Technology, etc. Secondly, each TTRP, as well as the IACP itself, is determined to maintain the integrity of the IA Tech Track program. There was extensive discussion on the need to cultivate a better understanding of the IA Tech Track program with all parties concerned. The discussions led to several actions, many described in the previous section, such as identifying the IA Career Field and its parts, developing a relationship with the TTRPs and the IA Masters, developing a better understanding with senior managers on their technical needs. Other actions:

- Better define the "height" of the steps one needs to take to get into Tech Track (action: TTRPs and IA executives, then recommendation to full IACP).

- Help IAs see the benefit of applying to the Tech Track (action: TTRPs and IACP).

- Incorporate more specific examples into the IA Tech Track criteria to give more guidance to the TTRPs (action: IACP).

- Resolve the issue of Technical Leadership at the Member level. This issue has now been resolved. The IACP, with its newest TTRP members present, decided not to make Technical Leadership a mandatory category for the Member level. This will affect approximately 16 individuals who were denied titles in the past

based on the perceived lack "of technical leadership.

- Initiate ways to encourage and organize mentoring of IAs pursuing membership in the Tech Track by senior members and masters (action: TTRPs, IA Masters, Senior Management, IACP). Until the issues of feedback/mentoring are resolved or changed, the TTRPs still need to provide feedback to the IACP Exec for Tech Track aspirants.

- Discuss the pros and cons of Tech Track positions (action: IACP with input to and from DDO/DDS THAB and Senior Management).

Follow-up: The IA Open Forum

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[_____] opened the forum with a review of the proceedings of the off-site, adding:

"We believe that having flexible training requirements will better meet the needs of all aspirants. This isn't a sudden shift in midstream; it is a move that will enable an aspirant to take courses that are more directly pertinent to one's current job in the IA field. *We're not asking for more or different courses; we're asking you to take a major role in developing your career within the boundaries of IA.* This direction is also more in line with the NCS training philosophy. It will eliminate the problem of taking classes merely to become professionalized, and will allow aspirants to take training that will enhance the skills they need for their current and future IA jobs.

"The idea of an integrated IA Career Field for the cryptologic system of the future is not dead. The IA Career Panel has continued—even renewed—confidence in the interdisciplinary and multidisciplinary vision encompassed by the Agency's decision to create the field several years ago. From time to time, we make additional course corrections, but these should not be seen as the reason for individuals to fear that their careers and programs will be harmed by constant tinkering with the system. We'll do our best to ensure that professionals and aspirants who enter the process under a given set of rules will be allowed to professionalize under those rules.

"Now, one more thing: from some of the e-mail we received, there was some confusion as to where someone might fit in the whole scheme of things. Briefly, there are basic professionalization *and* post-professionalization programs.

"Professionalization aims at creating a journeyman in the IA career field. With the breadth of the program, there is a definite advantage to certifying in IA; it gives you a broad base (with some specialization) from which to attack numerous, varied IA challenges. Those who are already professionalized in one of the IA predecessor fields have other choices. An individual may choose to get a second professionalization in IA and further develop the broad understanding of all aspects of the IA career field. On the other hand, he or she may decide to deepen an already acquired skill. One can do that by aiming toward a post-professionalization certificate. This program emphasizes the need to pursue additional, advanced level training after professionalization which will serve to refine or develop one's expertise in one of the IA skill areas. Individuals interested in this path must be certified in IA, in one of its predecessor fields, or in a related field, and must be working in the IA field. Again, we stress the absolute involvement of the individual and his/her supervisor in the development of a training plan that will orient them in a specific direction and cater to his/her personal and professional needs. Our IA Tech Track Program recognizes the post-professionalization program under the category of Advanced Education and Training. By the same token, Tech Track also recognizes all the work that goes into acquiring a second professionalization. You can get additional details on these programs from any of the panel members.

"With all that said, I would like to introduce D___ who, along with the rest of the panel, will be happy to answer any of your questions and address your concerns." p. L. 86-36

Summary of Question-and-Answer Period:

Concerns about availability of NCS classes

What is a reasonable period of time in which one might expect to get the courses required for professionalization? I have been waiting quite some time to get certain courses.

The delays that many people experience in getting courses may be due to a lack of space and/or instructors. The NCS, like the rest of the Agency, is being asked to do more with less. They have to depend on IAs from DDO and DDS to jump in the void and become adjunct faculty members for the IA courses required for professionalization. In fact, the IACP regularly encourages and solicits individuals to become adjunct faculty. We firmly believe that one must "give back" to the career field by mentoring and teaching. It would be wonderful if we could guarantee that you would get a course within

months after you've signed up for it. We can't do that right now but we are working very closely with the NCS to work out problems, to develop courses to meet the IA needs, and to prioritize our requirements.

There is a woeful lack of course available at the NCS for those who might be interested in pursuing the Information Services pillar of IA. What is the IACP going to do about that?

We have been looking into outside classes that will provide the training needed by someone working in the IA area of Information Services. We acknowledge that we are obligated to provide the training from other sources if it is not available at the NCS.

How is the IACP going to resolve the tug-of-war between operational necessity and need for training?

This is an age-old conflict. The NCS is looking at new ways of bringing training to the individual when and where they need it so that training will be an more integrated part of one's daily business. The flexible professionalization program we are proposing hopefully will go a long way toward resolving some of these problems.

How do courses dealing with Signals Research fit into the Post-Professionalization program (courses such as those sponsored or offered by the old ES)?

The IACP has always felt that the courses on understanding networks, packet switching, etc. are exactly in keeping with our needs to attack the challenges of the Global Intelligent Network. They have always been accepted in the Post-Professionalization Program and will continue to be accepted.

Tech Track Questions

Why do the standards and procedures for the IA Tech Track program in A and B Groups seem to be so different?

When the IACP first wrote the standards and criteria for the IA Tech Track, we spent a lot of time conferring with the different players to get their opinions. The resulting document purposely gave the TTRPs the latitude to deal with the variety and breadth of the IA Career field. Since the first document, the TTRPs have had the time to work with the document and have found that it needed some adjustments or fine-tuning. That has been done and the TTRPs are definitely working from the same document. However, there are some issues that are larger than the IACP and the TTRPs issues

such as whether or not to do interviews, the role of managers in tech track, etc. These issues are currently being addressed by the Key Component Tech Health Advisory Boards (THABs).

Does staff work (A05, B05, P05...) apply toward Tech Track? A number of people are under the impression that staff work doesn't count.

The IACP feels strongly that "staff work" definitely is a part of the IA career field. Editing, developing the USSIDs that govern IA work, preparing video reports on the SIGINT Digest, and developing the standards for the career field are all vital aspects of the IA field. These are broadening assignments that enable one to understand all aspects of the IA process. Mr. Goldsmith also noted that individuals probably should not spend their careers in staff positions since one needs to refresh/hone one's skills in target offices and contribute one's expertise at that level on a regular basis.

Why is there such a time lag in evaluating IT applications?

Most tech track applications are evaluated fairly quickly. B Group has had the largest number of applications and has been working diligently to clear up the backlog. The problem is that the IRP will review two applications and four more will come into the Panel office. The approximate period of time needed to evaluate the applications from members of B Group is 3 months. One of the changes we've recently made was to start including specific feedback with the notification letter. This will at the least decrease the time differential involved in getting feedback to the individual.

What type of incentives is the DDO THAB planning for TT members [in comparison to the DDT initiatives]?

It is worth noting that the DDO THAB authorized expenditures for technical seminars and conferences over the past 18 months that exceeded the DDT's proposal. This was done without the benefit of a specific incentive plan and details have been posted to the Technical Track topic on Enlighten. At the same time, they have been working on a comprehensive current plan that would include technical enhancement initiatives such as book purchases, etc. Approval of such a program is complicated by the fact that in order to provide the DDO IT members with a package similar to the DDT package, it would entail an investment of roughly $2.5M contrasted to the DDT $250K. A budget line of this magnitude at a time when we are cutting expenses

has a difficult path to approval and must be roundly supported and carefully accounted. This is an issue that requires patience and understanding. It is not one that is being or has been ignored. (input fm. Dale Roberts, P04 Tech Track Plan Director)

When will management incorporate technical leaders as a part of a decision-making team?

This is a two-part process. First, managers must recognize the value of using the leadership skills of technical experts on projects; those experts should be tapped on the shoulder and asked to be part of a team. That is happening in some parts of the Agency, but not all. By the same token, the technical expert must step up and volunteer. He/she should volunteer to take on the leadership role in a project and "sell" his/her worth to managers. Eventually technical leaders will become an integral part of management teams.

If I move from DDS to DDO, is the Tech Track title I received in DDS still valid?

Yes, this is an Agency program. The title you receive in one Directorate is absolutely recognized in the others.

Professional Development in IA

What level of competency does the IACP expect at the journeyman level?

As one is professionalized, we expect that you should be able to come right out of the starting gate and tackle a challenging IA problem. You might not be able to succeed at every aspect, but you will know where and to whom to go. The broad range of skills possessed by an IA will enable you to exploit a target without having someone hold your hand.

How does Post-Professionalization fit in with the recommended changes to the criteria?

(How many pillars will there be?) This is still under discussion in the IACP.

Where does layout and design, video reporting, and SIGINT Digest-type work fit into the IA career field? Is it considered part of IA?

These fields are absolutely an essential part of IA.

When will the changes be implemented?

We hope to have any changes in place by the fall.

The IACP hopes to hold an Open Forum at least semiannually as a public held advice concerns. In the meantime, feel free to contact the IA Panel office (963-1818 soon IO10@nsa) or any of the members of the IACP:

Bill Nolte, P054

to DISTHARB *

• * * = has a title in the IA Tech Track

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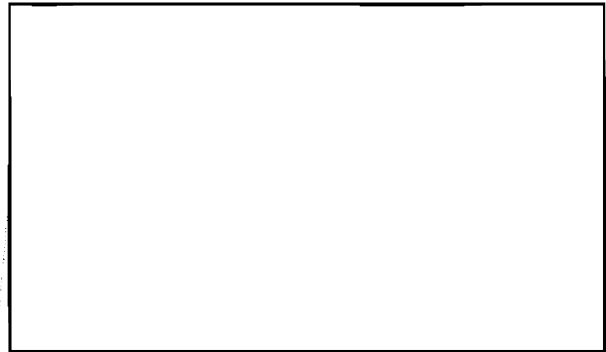Summer   1995
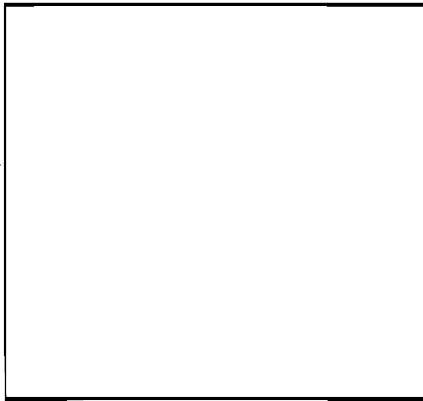
IA vs TA/IR - An Editorial

by [   ] ----

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The IR-TA debate rages on

(U) When I decided to attend Monday and Tuesday's Off-Site of the Intelligence Analysis Career Panel (IACP), I was unprepared for the evident polarization of views with regard to the Intelligence Analysis (IA) Career Field. Since becoming an IA intern in June of '94, I've become convinced that the decision to merge the Traffic Analysis (TA), Intelligence Research (IR), and Information Services (IS) Career Fields was a good one and was a bold and refreshingly innovative step towards equipping analysts with the breadth of skills necessary to meet present and future SIGINT challenges. Not all share this view.

(C) On Monday, some vocal members of the IA Technical Track Review Panels (TTRP) voiced concern over the need to place a clear definition of what an IA is. There was also some confusion over what that constituted analysis on the job. (Keep in mind that most TTRP members are not IA's. They are professionally certified IR's, TA's or both, and occupy IA COSCs.) The problems arise when these people are required to review the experience and education of a technical track applicant and grant them Member, Senior Member, or Master IA status based on a very general set of guidelines. The guidelines were purposely written that way to allow flexibility in determining what experiences and education applied or developed the skills associated with Intelligence Analysis. Unfortunately, not all agree on what those skills are and several applicants have complained that they did not receive the status they felt they deserved.

Semantics

(S-CCO) Take the term "analysis" as an example. Which of the following can be considered "analysis" as performed by an IA?

a. Developing UNIX/PINSETTER shells and computer tools used by IA's to analyze traffic.

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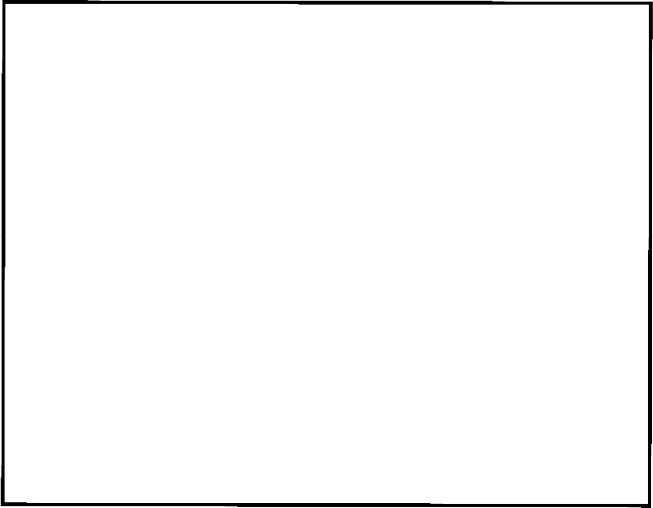
e. Working with data-flow personnel to try to determine if a recent drop-off in activity might have to do with the change in field reporting format.

f. Conducting research in the resource center in response to a Request For Information from an Office of Primary Interest (OPI) analyst.

(U) If you're a trained IA, you're likely to say that each of these examples falls within the domain of intelligence analysis. IR's and TA's often don't agree. P.L. 86-36

(C) [   ] one of the first graduates from the IA Intern program and previous council chairman defines an Intelligence Analyst as [/ //]

[   ]

.... I like this definition, and when I compare the above examples, I find that each one applies.

(C) The semantics problem is not only one of definition. It is equally one I call *bias of association*. What I mean is that when we hear the terms "Reporting and

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Traffic Analysis," we tend to envision an analyst doing very specific kinds of things. The two jobs don't even appear to be related in any way when we conjure up these traditional images. Some TTRP members seem to believe that the skills associated with each are so different that one cannot successfully do justice to both disciplines. I would agree, if we had unlimited resources and well-defined, static targets, but in our current reality, I disagree.

Generalists Or Specialists?
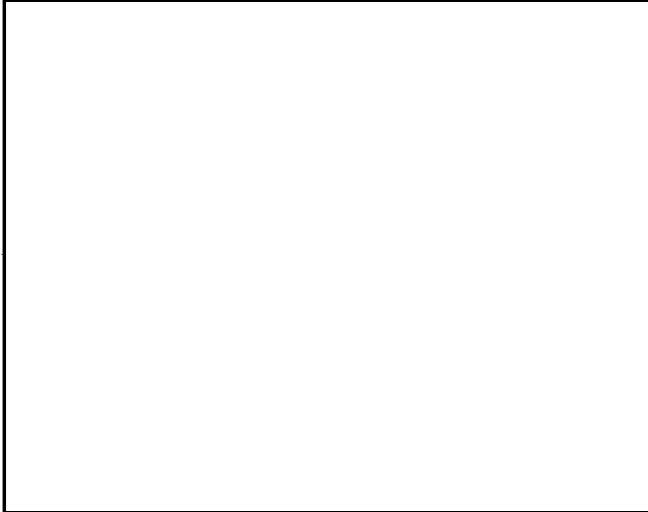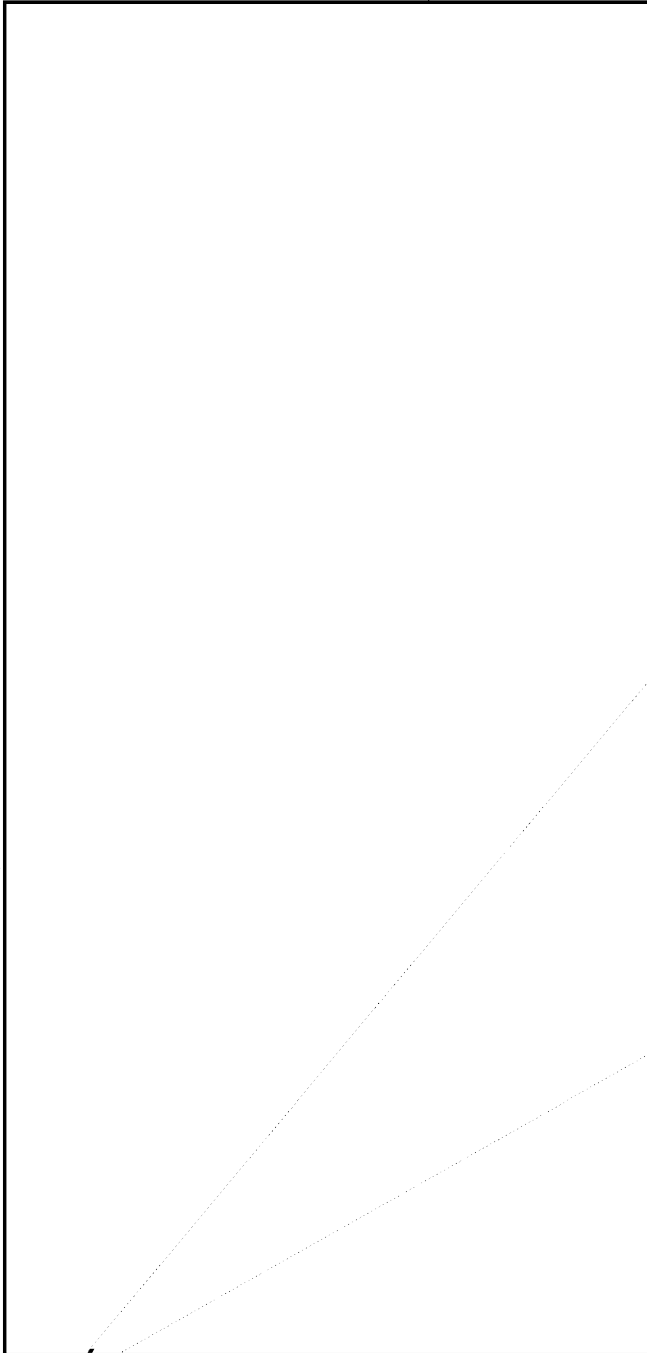
(U) We have to rethink the way we do business (you'll hear this as much as "more with less") and career field architectures of the past (read: IR and TA) are, for good reason, casualties of necessity.

The IA Career Field: Again?

(U) As with any completely new endeavor, the field has endured growing pains. There is resistance from the subsumed career fields, the ambiguity of its definition, and a lack of understanding of its content and objectives on the part of the rest of the Agency. Further complicating matters is that we don't have enough facts (rather than opinions) upon which we can properly judge whether the new career field is meeting the organization's and our national needs.
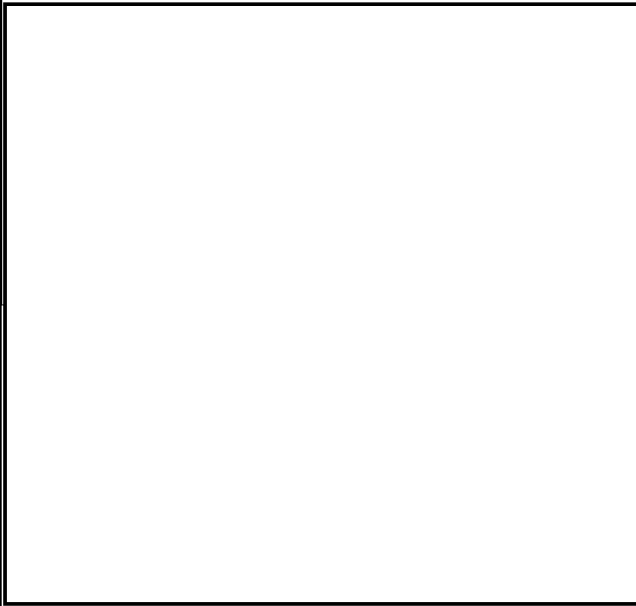
Whither Now?

(C) For at least the third time since its inception in 1990, the criteria of the IA Career Field are under review and will likely undergo change. A decision has already been taken to drop "Technical Leadership" as a requirement for Member-level status in the IA technical track and we are moving forward to redefining IA based upon the structure of its "Three Pillars." These Pillars are identified as IR, TA, and IS.

(D) I'm apprehensive about using these terms so aggressively when discussing our architecture for two reasons:

1. The *Bias of Association* which occurs at the mention of IR and TA and...

2. The IA program (required courses and experience) encompasses so much more and is greater than the sum of its parts. What about Signals Research, Target Development, and Collection?

(D) While perhaps having so many general skill categories as we currently do is somewhat cumbersome and confusing, I feel we do more damage than good by using the terms IR and TA to describe the Pillars of our career field...unless we've erred and wish to go back to the past, that is.

(D) Of course this is all my opinion, and as I've attempted to show, everyone has one. I think, however, that there are some valid opinions still left unheard— those of the IA Interns, and especially graduates of the program (and their supervisors!). It is *our responsibility* to make sure that our mentors know whether or not we feel as if we're getting the kinds of experience necessary to carry this Agency through hard times and into the the 21st Century. I urge you all to let them know immediately.

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The Phoenix HF: An Editorial

by N.C. Gerson, R52

(D) A recent note in NATO's Scientific Technical Planner (STP) acknowledges that HF is not dead but is a reliable contender for long-haul communications. NATO found that on a cost basis (per message or per year) HF is cheaper and about as effective as more costly and sophisticated satellite circuits. In short, NATO discovered what
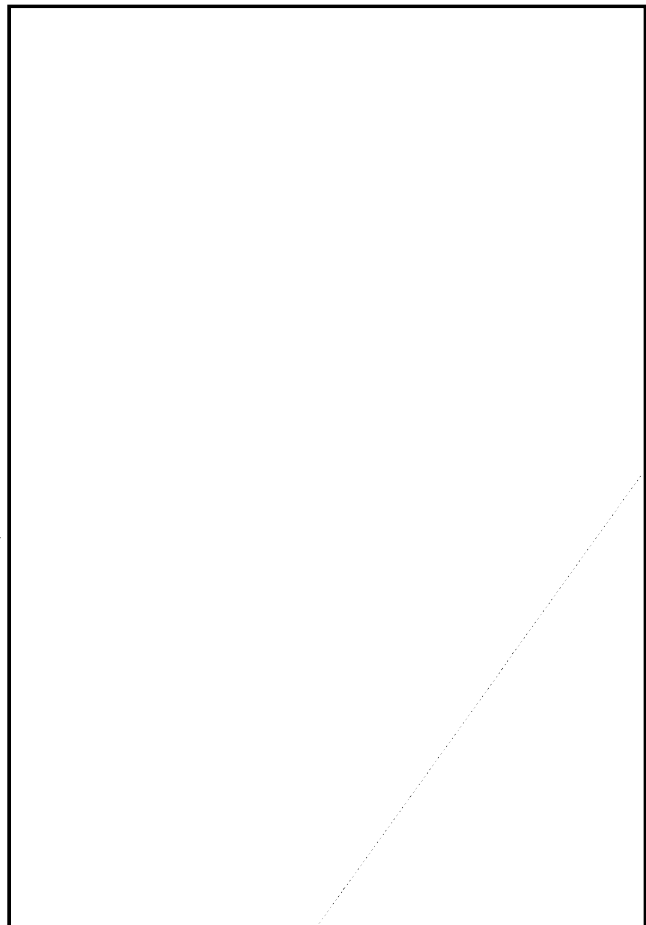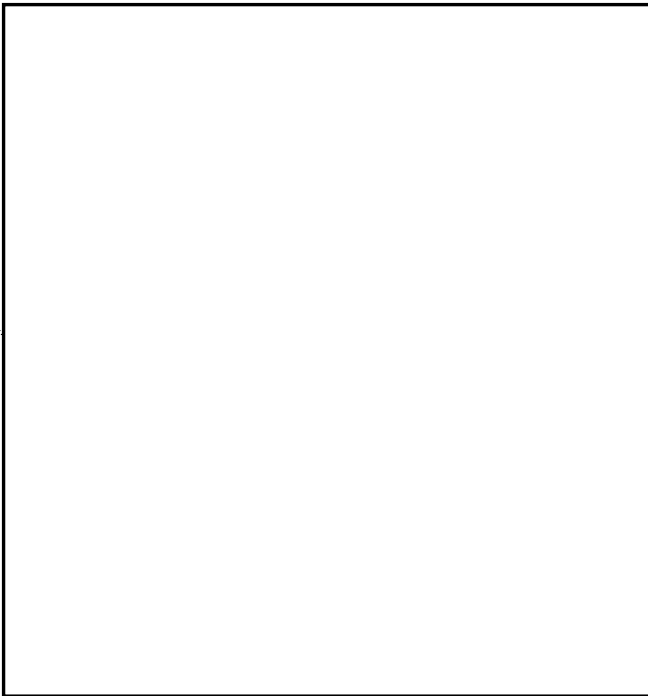
NSA's "Lessons Learned" Database

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by Ben Cwalina, N25

(U) Would you like to know what lessons NSA has learned lately? If you have ( ) available on your computer then it's easy. Look at the Directorate for Plans, Policy, and Programs (DP) homepage and click on the "Cryptologic Lessons Learned" button under DP PRojects and Publications, or, under NSA Projects/Programs, [ ] After entering the database you will see the menu that provides the categories of lessons learned: Crisis Management, Security, SIGINT, Interoperability, and Communications. A very important part of the database is the "keyword" search. You can place any word in the search area and within seconds, if a lesson was ever written using that word, the lesson number will appear on your screen.

....

Here is a sample:

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1. (U) TITLE: Near-Real Time Intelligence (NRTI)

2. (U) KEYWORDS: 1537, 1536, 1519, 1539, 1543, 1549, 1559

3. (U) OBSERVATION: On December 19, 1994, the Washington Post reported that the *USS Kitty Hawk*, a U.S. battlegroup carrier, had located and trailed a Chinese nuclear submarine operating in the Yellow Sea from 27 to 29 October, 1994.
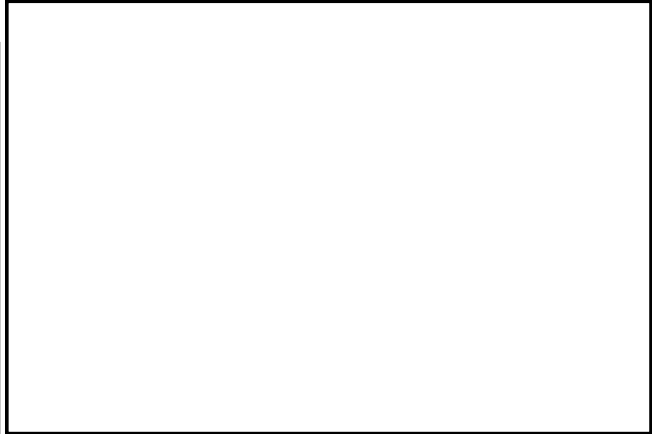
5. (U) LESSON LEARNED: New technology displays the value of SIGINT.
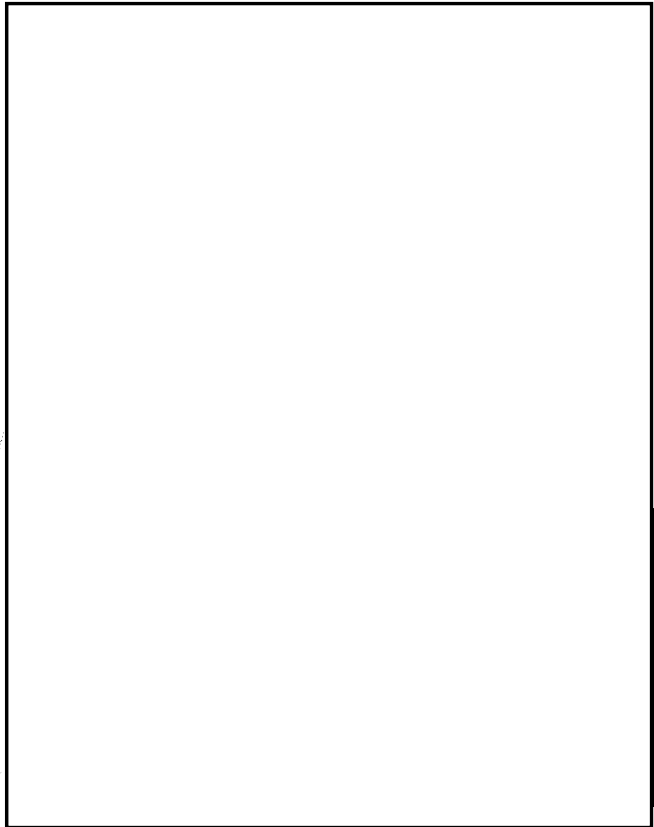
The 1995 Joint Mathematics Meetings

ed. by [   ]

(U) The Joint Mathematics Meetings of the American Mathematical Society (AMS) and the Mathematical Association of America (MAA) are the annual event for mathematicians in the United States. The 1995 meetings took place in San Francisco, California from January 4 through January 7, and offered a panoply of happenings which cater to the variety of interests of the 4000 registrants and 400 exhibitors. The short courses, invited talks, and contributed-paper sessions allowed us to learn about current areas of research and interest in both academia and industry. But the Joint Meetings proffered much more than the trappings of a traditional technical conference. Many other sessions, organized by individuals as well as professional organizations, delved into related issues. The variety of other issues addressed included teaching and learning (titles include: Calculus from graphical, numerical, and symbolic points of view, Learning styles approach to mathematics instruction, Teaching with original sources), career considerations (Mathematical preparation of the technical workforce, Learning about today's job market for mathematics PhDs, How to help your students prepare for and find jobs, Life after retirement), Internet usage (Internet tools: what are they and how do you get them; e-MATH on the World Wide Web), competition and rewards (Mathematical competitions bringing out the best?, Recognition and rewards in the mathematical sciences), and special issues facing women and minorities (including events sponsored by the Association for Women in Mathematics and the National Association of Mathematicians). An exhibit hall full of prospective employers (including NSA), software firms, publishers, and professional organizations offered additional information to members of the U.S. mathematics community.

(U) The 1995 Joint Mathematics meetings provided an excellent opportunity for Agency mathematicians to develop and maintain contacts with mathematics and mathematicians on the outside. Attendance at this conference allowed NSA mathematicians to keep abreast of the "hard-core" mathematical research being done on the outside. Other sessions, such as those on teaching and mathematical career opportunities, gave Agency attendees a good feeling for

the issues of importance to our national mathematics community. Sessions on women and minority issues allowed us to gauge the concerns of these specific populations. Many NSA mathematicians used this as an opportunity to maintain and expand their network of acquaintances in the U.S. mathematics community. Many Agency conference attendees staffed the NSA information booth in the exhibit hall, discussing employment opportunities with prospective applicants and distributing general information to those who were just curious about what we do. Several Agency employees conducted interviews with Agency applicants. The reunion held by the Site Steering Committee of the NSA Women in Mathematics Symposium (WiMS) (funded by R51) provided an informal opportunity for all interested conference attendees to learn about Agency employment (more on this event follows).

(U) There was an incredibly large number of talks at the conference, with as many as 20 events running simultaneously, ranging from very technical to more general. There were talks oriented toward mathematical research, theories, and history as well as talks discussing the Internet. There was an emphasis on the relationship between academia and industry, with an emphasis on curriculum reform. The Agency representatives attended a variety of talks and activities, including:

(U) **Mathematics and the general public: What do they know? What should they know?** Panel Discussion by the Joint Policy Board for Mathematics (JPBM). The panel included mathematicians and several members of the popular press discussing how math ideas and discoveries are treated in general publications. The panelists stressed the need for mathematicians to tell others (e.g., via newspapers) about our exciting news. Suggestions for getting math articles published included being willing to generalize results (even at the risk of distortion!), focusing more on the human-interest aspect (e.g. how does this math result change people's understanding or lifestyle?), and learning to state the problem to be solved using language the general reader can comprehend. One panelist thought that the philosophical aspects of math would be of particular interest to the general public. He even won-

dered whether "God was a mathematician" since, as he put it, math is able to describe our world so well.

(U) Internet tools: What they are and how you get them,

Wendy Bucci (AMS). This presentation introduced people to some of the tools for finding information on the Internet: gopher, veronica, archie, ftp, telnet, WAIS and WWWW. Gopher is a menu-driven index of various on-line services (such as card catalogues for some libraries). Veronica (Very Easy Rodent-Oriented Index to Computerized Archives) is an indexed database for gopher sites; it returns a gopher menu. Telnet allows one to connect to a remote system and execute commands as if one were at the remote site. The ftp (file transfer protocol) allows uploading and downloading of files from and to your own local file system. Archie is an indexed database of ftp sites; it returns site and file names. The search is performed only on file names and descriptions; for a search on actual text one must use WAIS (Wide Area Information Service), which returns a ranked list of documents based on the number of occurrences of search strings. WWW (World Wide Web) allows one to search gopher, ftp, telnet, WAIS, and Web sites. Some on-line help is available for commands such as archie and veronica through the e-math telnet site which is operated by the AMS.

(U) MAA Session on Teaching with Original Sources.

The really interesting thing about this session was the uniform conclusion that there are real benefits to teaching from original sources. Chris Stevens of St. Louis University felt that the use of primary sources in the classroom emphasized to the student how good/bad notation helps/hinders progress on mathematical problems. Professor Stevens tries to emphasize the relationship between mathematics and the culture of a period to show how the knowledge of mathematics is distributed in society. She feels that this illustrates what the practical uses of mathematics were (and are) in everyday life, and serves as a good example of how mathematics can be used in the non-academic world. In one particularly interesting assignment, she asked her students to pick a year in the past and find out what the mathematics curriculum consisted of at their college. She reported that students were astounded to find that in the year 1875, students took 2 year-long courses in arithmetic, followed sequentially by year-long courses in algebra, geometry, trigonometry and surveying, and finally calculus! Professor Stevens noted that the math universe seems to be expanding. Today's college

mathematics curriculum have shifted the focus from the student and instead rush through basics in mathematics in order to cover as much advanced material as possible.

(U) Math in Industry,

Avner Friedman (RPPI), Paul Davis (Worcester Poly technic Institute). This session detailed the results of a recent industry study. To summarize, industry desires the following traits in the mathematicians they hire:

O Broad background with depth in one subject

O The ability to work in teams

O Communication skills (speaking, writing, listening, reading)

O Promise of continued professional growth

O Computer skills

(U) *Bottom line: industry is looking for flexible problem solvers (whatever we call ourselves) who can communicate with non-math consumers.* Industry is not nearly so impressed with a math degree as our ability to work with others to get answers that are "good enough." The speaker noted that many in industry fear that mathematicians have an interest only in proving theorems, not relevant problems. He added that encounters between academia and industry are limited by geographic proximity to chance meetings. Mathematicians need to be able to understand the practical problem, and communicate their solutions clearly, without generalizing them to the extent that they are incomprehensible to others in industry. He added that mathematics students undergoing a one-year internship in industry, like that program established by Professor Friedman, have found their lives changed. Such an experience provides them with the self-confidence and self-esteem to succeed as mathematicians in industry.

(U) MAA Minicourse: Teaching Environmental Numeracy To Liberal Arts Students,

Martin E. Walter (University of Colorado, Boulder). Walter is a mathematician and an environmentalist; which passion is stronger would be difficult to tell. His goal is to make mathematics come alive for his students; his agenda is the environment. The enthusiasm with which he embraces these subjects is a pleasure to witness, and the degree to which he combines them quite remarkable, as are his conscious efforts to allay the fear of mathematics that some students have. He uses the environment to teach mathematics and he uses mathematics to teach understanding of the environment and

the need for an "ambient, functioning ecosystem to carry our civilization.'"

(U) The primary objective for the course is the completion of a project on an environmental topic of the students" choice. By allowing the students to choose the topic, he finds they are much more likely to be motivated to conduct research and learn mathematics. The students make a claim and attempt to prove it. Walter makes extensive use of open-ended environmental problems to stimulate interest in both the environment and the learning of mathematics. For example, a discussion of population growth provides an entree into logarithms. He also challenges students to try to come up with a model to control the population, or at least keep it from exploding. This leads to the need for scaling, or "how to lie with graphs." Other environmental issues that provide content are: deriving energy from junk mail, acid rain, and oil slicks. Health issues such as AIDS and nutrition (e.g. milk and muscle: how high can you climb on a liter of milk?) are also fair game.

(U) To allay student fears, the class begins by confronting "mathese." The question is asked, "How would a mathematician say that?" The course is open to students at all levels of mathematical experience. They begin the course by taking a mock exam that Walter uses as a diagnostic tool to assess the students' level of ability. To accommodate the wide range of experience, the level that students attain at the end of the course is not the focal point; rather, the critical factor is that a student makes progress.

(U) Walter uses a variety of exercises to relate to his students; his notes contain descriptions of personal experiences and anecdotes. He also uses examples of poets and architects. His material is current; he even has an exercise that gets students out on "the information highway." Students become mini-experts on their topic of choice. Along the way, they learn to think critically. His goal is to create people who can and will critique, or explain, articles in the New York Times or assertions

Can math explain this?

made by people like Rush Limbaugh.

(U) In reflecting on Walter's style of teaching mathematics, one attendee found a lot that she could take away. Our agenda, of course, is not the environment, but perhaps we could wrap up our teaching of mathematics with our agenda just as effectively and with similar levels of enthusiasm.

(U) **MAA CUPM Subcommittee on Service Courses Special Presentation: Reform in Engineering Curricula.** While coming at the problem from a different perspective, this panel came to many of the same conclusions that the participants of the AMS Committee on the Profession Presentation discussion on math in industry. Delores Etter (Electrical Engineering and Computer Science, University of Colorado at Boulder) noted that the CEO of Martin Marietta had come up with the following list of reforms for the engineering curriculum of the 21st century:

1. Emphasize the basics, including applications with hands on experience, and experience in manufacturing and design.

2. Develop team skills.

3. Teach students about the political process and how to present a case.

4. Develop communication skills.

5. Teach system engineering to emphasize the combination of diverse disciplines.

6. Understand international communications since we are moving towards more of a world market.

7. Emphasize generated diversity.

8. Increase commitment to continuing education.

9. Education should be affordable and of quality.

10. Engineering should be a master's degree.

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The Director of Engineering at the National Science Foundation came up with the following comparison between today's and tomorrow's engineering approaches:

Today	Tomorrow
vertical thinking	lateral thinking
abstract learning	experiential learning
reductionism	integration
develop order	correlate chaos
understand certainty	handle ambiguity
analysis	synthesis
research	design/process/manufacture
solve problems	formulate problems
develop ideas	formulate ideas
independence	teamwork
technological/scientific base	societal context
engineering science	functional core engineering

(D) Mathematical preparation of the technical work force, MAA sponsored panel discussion led by Susan L. Forman of the Mathematical Sciences Education Board. Panelists presented their views and experiences relating to the need that business and manufacturing areas have today for employees with higher levels of mathematical sophistication. Employees are needed who can read and interpret graphs, solve problems, estimate, use computers, use and interpret probabilities and statistics, collaborate and communicate mathematically in writing. Discussions focused on the tradition of tracking students into more theoretical math courses at a relatively early age. This limited their ability to make changes later, to continue to study math at the community college level or beyond, for example. The view of one speaker was that if the curriculum is fundamentally theoretical enough, people will be able to move in and out of the education arena. It was stressed that it is critical to teach the theory through the vehicle of the applications. Another speaker stressed that lifelong learning *is* a reality of the workforce. Examples were also cited where changes such as these have already been made.

, (D) One panel member stated that quite often important results are obtained by the sophisticated use of elementary mathematics. (An NSA attendee feels this also is the case at NSA; many times critical problems are solved with rather elementary math, but with the mathematical maturity to know that the answer is

right.) One of the reasons that math is seen so impractical to the average high school student is that college-prep-type schools emphasize theoretical knowledge rather than the applied skill taught in technical schools.

(D) The Information Superhighway and You, panel discussion sponsored by the MAA Committee on Computers in Mathematics Education and Committee on Electronic Services. The first speaker was from Silicon Graphics. His points were:

- Networks were slower in the past but we were only transferring small ASCII files. Systems are faster now but we don't see an increase of efficiency because of the huge files (video, etc) involved.

- The Internet has a lot of good stuff in it but the majority of the information is junk. Like TV, the Internet could be used for tremendous educational advantage but the money is in entertainment, so, as with TV, the Internet is dedicated more to amusement than to education.

- World Wide Web (WWW) services are typically organized very poorly. He also noted that it is easy and fun to set up a homepage but very difficult and laborious to properly maintain it.

(U) The second speaker was from Bell Labs. His main points were: The information superhighway is more than just the Internet; it also comprises telephone lines and other communication media (cable, satellite, etc). He mentioned Vice President Gore's ambition for a virtual equivalent of the national highway system; his father was instrumental in building, but said that there was no need for the "construction" of such a system since it is already out there and in use. It grows as users increase. In his opinion, the big problem with the Internet is that there is no one in charge; it is running itself. Furthermore, since it is global in scope, there is no governing body capable of enforcing regulations.

(D) The last speaker's points were: There are major potential commercial uses for the Internet if security concerns can be resolved. The ability to post anonymously is one of the problems. In fact, right before the conference someone posted an item that stated that Microsoft had bought out the Catholic Church. While it should have been obvious that this was a spoof, many people on the Internet were fooled by it, as was Microsoft claimed when it issued an official denial. During his

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talk, the speaker asked how many people in the audience had never heard of or knew about public-key cryptography. Unbelievably, in an audience of 150+ mathematicians, approximately 30% raised their hands.

(U) **Ingenious Mathematical Amateurs: M. C. Escher (artist) and Marjorie Rice (homemaker),** Doris Schattschneider (Moravian College). A very interesting presentation on contributions of non-mathematicians. Escher's work is of course well known through his incorporation of various types of symmetry in his art work. Schattschneider presented several samples from his notebooks and discussed a classification system Escher developed. Rice, a housewife from Florida, became interested in tilings after reading an article by Martin Gardner. She developed her own classification system for pentagons which hit the plane and was responsible for discovering several new tiling pentagons which had not been identified previously.

(U) **Synchronous Fireflies,** Steven Strogatz (Cornell University). This talk was part of a contributed paper session on **Chaotic Dynamics and Fractal Geometry.** The speaker described many systems that spontaneously synchronize, and showed how we can model this mathematically. The talk included a fascinating video about South Asian fireflies that flash in synchronicity (North American fireflies don't do this!). This example of a self-organizing system was used to illustrate a discussion on how synchronicity occurs out of apparent chaos.

(U) **AWM Workshop.** The point of the workshop was to give women graduate students and postdoctoral mathematicians an opportunity to present and discuss research with other women mathematicians. Postdoctoral women gave 20-minute talks, and graduate students displayed posters. The lunch buffet was especially nice as it provided time to meet and visit with various mathematicians.

(U) **AWM Panel: AWM (The Association for Women in Mathematics): why do we need it now?** This was a lively meeting attended by approximately 100 people, primarily women (and one baby). The format was a panel discussion followed by a question and answer period. The first speaker, Sylvia Bozeman (Spelman College), commented that there have been a lot of changes since the founding of the AWM in

1971. She noted that, according to a survey taken in 1986, less than 2% of the students in the mathematical sciences are African-American, and added that there is a lot of attrition at each educational level. She pointed out that 1.7% of the mathematics PhD.'s go to African-Americans, 15% go to women, and 20% go to women who are U.S. citizens. She believes that there is a serious need for mentors for these women, and that the AWM can provide a forum for discussion of such concerns. Professor Bozeman pointed out the importance of summer math programs like the one held jointly by Spelman and Bryn Mawr. Such programs provide an opportunity for women to enter into mathematics, as well as an excellent networking opportunity. She believes that the AWM provides a badly needed opportunity for minority women to belong to a proactive organization.

(U) **Ruth Williams** (University of California at San Diego) was the next panel speaker. She discussed a Women in Probability Conference which was held in October 1994 and which she organized ▮▮▮▮ served as a panel speaker at this conference). She pointed out that a lot of young women, both graduate students and junior faculty, filled out the list of approximately 60 attendees. This provided an excellent opportunity for networking, allowing people to get advice on subjects such as obtaining tenure. Women in general need to be more active at conferences, serving as speakers and organizing special sessions. Professor Williams added that research institutes (e.g. Institute for Advanced Study) are good places to visit early in one's career, but such things as the absence of child care stand in the way of making this a viable alternative for women.

(U) During the question-and-answer period several interesting points were made. ▮▮▮▮▮ talked briefly about the Women in Mathematics Symposium (WiMS) which was held at NSA in November 1993. She noted that the conference was held for the altruistic reason that the Agency was concerned about how few women are pursuing mathematics as a career, and for the more selfish reason that the Agency is concerned about a future absence of women mathematicians in their applicant pool. She noted that one of the suggestions from the conference, to make the recruiting literature more informative for an audience of women mathemati-

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diams, had been implemented in a one-page addendum which was available at NSA's recruiting booth. Dr. ⎣oted⎦noted how important it was for the WWM attendees to keep using the network that this conference created. To that end, she announced a WiMS reunion which would be held Wednesday night and emphasized that all were welcome to attend (immediately following her remarks, another woman got up and insisted that the purpose of the AWM is for women to band together and not work for places like NSA).

(U) Ruth Williams mentioned the NSA Women in Mathematics Symposium which she had attended. She specifically mentioned the *Proceedings* that came out of that conference. She feels that it is very important to document conferences in this fashion not as a result the best networking and dissemination of material.

(U) **e-MATH on the World Wide Web** (AMS presentation). Currently, the January 1995 *AMS Notices* are available electronically and so on previous volumes back to 1992 will be on-line. By 1996, it will be possible to have an e-mail subscription of the *Notices* of the AMS and the *Bulletin*. The organization will be the same as for the hardcopy and the cover of the *Notices* will even be scanned in full color (the cover has changed as of January 1995 and is no longer an ugly shade of beige). A preprint service is available via the AMS home page, and even if if an author has used another ftp service, it is possible to register on the AMS service so that a link will be provided to the other service. The list of availability isn't very large yet, but eventually, abstracts will be available and it will be possible to search for on-line articles by author, subject, issue, etc.

(U) **Teaching Linear Algebra with Technology: Its Impact**, David Hill and David Zitarelli (Temple University). Hill and Zitarelli gave a talk and demonstration of the Linear Algebra course they have been teaching at Temple since the mid 80's. The course consists of 3 hours of classroom instruction plus about 2 hours of lab per week, where they use MATLAB 4.2. The lab experiments are under the control of the student, who supplies the input and the logic, with MATLAB doing the arithmetic and graphing the geometric significance of the results. The student is encouraged to work by hand on the problem at first (for example, doing row operations in the solution of simultaneous linear equa-

tions) and then run the program which does the same, and a second program which graphs the steps step of the algorithm. The student is also required to explain in writing the scenario for each system of equations (i.e., whether the system is consistent, has a unique solution, infinitely many solutions, etc.). For further understanding, the student can run *rrefmovie*, which runs a "movie" of the changes which take place as the algorithm progresses.

(U) Such technology obviously has the potential to make Linear Algebra more understandable. The speakers emphasized, however, that technology does not make bad teaching good, but that it does make teaching more challenging, because the instructor must adapt to changing technology and also adapt the technology to his own situation.

(U) **NSA WiMS reunion.** The reunion of participants of the November 1993 Women in Mathematics Symposium was well attended with approximately 50 external people. It was an excellent opportunity to mingle with other mathematicians (men and women) in a relaxed, less overwhelming atmosphere. This provided a nice opportunity for us to advertise ourselves. We found that the WiMS Proceedings and the one-page addendum developed by WiMS for our recruiting literature were popular items at this get-together. The success of this function can be largely attributed to the unselfish enthusiasm of many Agency conference attendees. A showing by of a lot of NSA mathematicians, including a lot of young women, went a long way towards showing that NSA is an affirmative action employer with a large community of women mathematicians which it is eager to retain. Leslie Gruis strongly recommends that a similar function be held at the Joint Math Meetings again next year. Such social occasions give a relaxed way for academic women mathematicians to maintain their contacts with the Agency, and serve to maintain the network which was established by WiMS.

(U) **NSA Information Booth and employment registry.** Working the NSA information booth was one of the most interesting activities. We met lots of academic mathematicians, professors and graduate students, who wanted information on job opportunities, and talked to quite a number of women about opportunities at the Agency. It was fairly busy, with most questions pertaining to employment and to summer

programs. One Agency representative felt that there was not adequate information to distribute about the summer programs available here at the Agency—the Director's Summer Program, the Z2 Summer Program, or the Z5 Summer Program. Many instructors came by the booth looking for information on summer employment at the Agency and we had more to give them.

Conclusions

(U) The 1995 Joint Mathematics Meetings provided an excellent opportunity for Agency mathematicians to develop and maintain contacts with mathematics and mathematicians on the outside. These contacts came in a variety of settings: through technical talks, panel discussions, and informal networking events such as the WiMS Reunion. The large number of NSA people sent to the Meetings, and in particular the high proportion of NSA women attending, spoke well for the Agency. It shows that NSA is committed to taking an active role in the mathematics community. It is important to make ourselves seen and to let people know that a wide variety of good mathematics and opportunities exist at the Agency.

(U) Considering the diversity of events at the Joint Meetings, it is hoped that NSA will be able to fund a comparable number of attendees for the 1996 Joint Meetings. So many things went on simultaneously that it was very difficult for the attendees to cover everything. The WiMS Reunion was a good first step towards getting more Agency attendees actively involved in this conference. It is hoped that NSA attendees will be able to maintain a higher profile at this conference next year, perhaps through giving technical talks, organizing special sessions, or serving on panel discussions. Only through active involvement and participation will the U.S. mathematics community come to recognize NSA as a prestigious place with which to be associated.

This article was condensed from trip report by

Joyce Keller,

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SIGINT Bloopers

Despite the best efforts of the IS-180 and IS-290 instructors, some of our product reports contain real howlers. The most common category, of course, is the homonym, or What Spell-checkers Don't Catch:

"The Secretary arrived in a Lear Jet." Who manufactures this aircraft? And does the official in the following example use one?

"Foreign Minister Leary of International Disapproval"—we didn't know there was an Irish Cabinet-level post devoted to international disapproval.

"The ambassador to the Holy Sea"—let's see, would this sea be the Dead Sea, or the Great Salt Lake?

"Zendia waivers on secret ballot"—wavering on whether to waive secrecy, perhaps.

"The journalist, a known confident of the department head"—confidant of his access, no doubt.

And we have lost count of the number of attempts to "diffuse" explosive situations (very effective, spreading those explosive situations around) or to "illicit" a response. Likewise those entities that find themselves in dire straights. (We applaud the field site that actually issued a change correcting a report containing this one.)

It's not just product reports: remember the poster for Law Day proclaiming that a distinguished visitor's talk would "sight" famous court cases? (This one was followed by a more fitting example.) Or the staff memo that referred throughout to the country of "Cypress"? (Was that where the tree-people in "Lord of the Rings" came from?)

Vacancy announcements are not immune: "This opportunity is taylor made for intelligence analysts." Who is this person Taylor, and does she make other opportunities?

Too great dependence on spell-checkers leads to another source of puzzlement: hitting the "correct" key without looking at the suggested correction.

We have seen Zagreb described as the "Creatine" capital (creatine, FYI, is a hydrocarbon) and a reference to the cryptozoite community" (probably a very small community, given the size of your average cryptozoite).

Malapropisms are another category: "This would allow the bank to recuperate its losses."

Then there's the Almost But Not Quite Right Word: "The number of wounded was unaccountable"—we can see those UN observers scratching their heads; there's just no accounting for some things.

"Technicians awarded for good work"—a novel approach; what would you do with the technician you were awarded?

"UN observation post overtaken by rebels"—the post was heading southwest when the rebels caught up with it.

This category reminds us of Mark Twain's dictum that "the difference between the right word and the almost right word is the difference between lightning and lightning bug."

Slipshod cutting and pasting, and other careless editing, results in such gems as "the government, frustrated by a lack of failure to prosecute the case", or "please cancel distribution this report." Grammar-checkers are not yet sophisticated enough to catch these.

Nor will they catch such startling titles as "Boutros-Ghali To Be Advised Not To Request Troops To Take Safe Haven From The UN Security Council"—It must have come as a shock to the refugees to realize they were being held prisoner by the UN Security Council.

Thanks to all the eagle-eyed readers who passed on these examples of What To Watch Out For. Contributions to a follow-up column will be gratefully accepted!

KA

Patriotic Liz does her part

Book Reviews

For the President's Eyes Only

By Christopher Andrew. NY: HarperCollins, 1995.

Reviewed by Bill Nolte, P054

(U) At the risk of stating the obvious, an understanding of American intelligence (or foreign policy) requires an understanding of American ideals and values. While the same could be said of German or Transylvanian intelligence, a particular emphasis in the U.S. on public adherence to high standards of morality (or moralism), openness, and legality provide a context for intelligence operations unlike that faced by any other great power. This carries over even into the scrutiny of intelligence, where the question asked is more likely to be "Was it legal?" than "Did it work?" One consequence of this is that American observers or students of intelligence, academic or journalistic, who accept the necessity of intelligence must often spend a great deal of effort professing that they do so while concurrently believing in democracy, human rights, and other American ideals.

(U) Perhaps because they need not be concerned about running afoul of such ideals, British historians appear to have an advantage in the developing literature of intelligence. An inclination to accept as a necessity of state and an ability to at least understand the context in which intelligence must take place in this country seem to come together in the works of such historians as John Ranelagh and Christopher Andrew. Some years ago, Ranelagh's *The Agency: The Rise and Decline of the CIA* provided a critical but sympathetic look at CIA and American intelligence in general. In concluding that in moments of "achievement as well as condemnation," CIA mirrored the efforts of the "most decent of the great powers . . . the one that even in its darkest passages practiced most consistently the virtue of hope," Ranelagh struck a balance that many American critics would find difficult to achieve.

Bully for intelligence

(U) Christopher Andrew's *For the President's Eyes Only* establishes an equally balanced view. In this account, American intelligence is a mirror both of the fluctuations in America's role in world affairs in the 20th century and in the evolution of American public ideals this century has induced. Even more particularly, and extending back to the beginnings of the Republic, the history of American intelligence, Andrew makes clear, is inextricably linked with the history of its presidency.

(U) For most of this country's history, intelligence enjoyed an even lower rung on the ladder of national interest than did either the military or diplomatic components of what we would in recent times come to describe as the national security establishment. George Washington understood the value of intelligence, but few of his successors did or needed to. The good fortune of this nation was that few of them needed to know much more about military or diplomatic affairs between 1855 and 1914.

(U) By the 20th century, of course, the world had changed, with predictable results across all three components of the national security apparatus. Theodore Roosevelt broke the mold in his interest in intelligence, but that was a typical TR reaction to virtually anything. In intelligence as in much else, Roosevelt was a harbinger of change.

(U) Presidential interest in intelligence from 1917 through 1940 reflects the wide swings in presidential and public attitudes toward international affairs in general. The First World War brought an explosion of intelligence capability (and in cryptology brought to prominence both Yardley and Friedman); the 1920s brought the illusion that "normalcy," as defined by Victorian and Edwardian standards, could be restored. After 1940, of course, U.S. presence as a world power

...a permanent part of our national life, a development Andrew traces with great skill.

(U) This should not suggest that after 1940, all was linear and progressive, and here perhaps the requirements of the survey form (i.e., so much data, so few pages) lead the author to understate slightly the centrality of the period 1945-1950 as a conscious and difficult redirection of that policy.

(U) Andrew describes President Truman's use of intelligence in fairly positive terms-this, after all, being the President who created the Central Intelligence Agency, the National Security Council, the National Security Agency, and the (more or less) unified Department of Defense, much of the key instrumentation of postwar American intelligence. Andrew might have focused a bit more on the extraordinary transformation of this president, whose early motto of "economy and efficiency" was not far removed from an earlier time's concept of "normalcy."

(U) Though Truman's view of the world had been influenced by the First and Second World Wars, it took a remarkable (and still controversial) series of actions and reactions for this small-town-bred, Midwestern president and his largely Eastern patrician advisors to convince the American people that they had entered into a period of virtual war no less dangerous than the actual war they had just won. In the end, Wilsonian optimism, embodying the view that American involvement in the military and political crises of Europe and Asia could be episodic and conclusive, had failed. The cold, dark reality of the late 1940s was that a permanent struggle was under way, with no assurance it would end in a world in which democracy could survive, let alone be made safe.

(U) The remainder of Andrews' work is a restatement of the drama that followed. What makes this an especially valuable restatement is the author's success in noting the degree to which intelligence reflected the interests and views of the presidents who followed Truman. From the structured mind and extensive experience of Eisenhower, through the romanticism of Kennedy, and the provincial insecurity of Johnson, as through the presidents who followed, the relationship between presidents and the intelligence establishment (especially the CIA) remained remarkably sensitive to personality. It may be an exaggeration, but one suspects that throughout the Cold War era, especially in the pre-Nixon period, intelligence remained remarkably person-

alized in its support to the president, with a relative lack of institutionalization.

(U) Before the reader scoffs, note the keyword "relative." Below the surface serenity the presidents, institutionalization took place, both within those intelligence components subordinate to cabinet departments and within the CIA. And in fact, one of the correctives of the Watergate era and beyond was a continued effort to bring intelligence into greater institutional and regulatory conformity with the rest of American government.

(U) This brings Andrew's study to a close and the rest of us to the present question: as we cope with the still-being-defined post-Cold War world, what intelligence structure and capabilities does the United States need? In a world in which closed totalitarian societies have (with a few very dangerous exceptions) disappeared and CNN and Internet have provided open sources with access and coverage imaginable only a few years ago, do we need an apparatus that limits very secrecy moves toward the edge of what the American polity can tolerate?

(U) The good news is that neither the polity nor its values are frozen in time. As we enter a period of transformation, it may be reassuring to keep in mind that three times in this century–in 1917 (with an assist from the German Navy), in 1941 (with an assist from the Japanese Navy), and in 1947-1948 (with an assist from the Red Army)-presidents have asked the American people to take on the responsibilities of a challenging world. And each time an American nation maturing with experience has responded. Whatever the difficulties facing the United States as it moves to the next millennium, the 1970-something comment of a European-born academician that the United States would be "the first country to go from adolescence to middle age without passing adulthood" seems thoroughly wrongheaded.

(U) Taking a deep of extrapolation, Andrew has written a useful text for the era of retooling of the American intelligence apparatus, one that suggests this country will ultimately get the kind of intelligence system it, as expressed through its presidents, wants. With its focus on the relationship between presidents and their intelligence tools, Andrew's study barely touches on the relationship between intelligence and the Congress. This may be the book's greatest flaw, for at some point American intelligence becomes less than fully the prop-

erty of the President and more of a resource shared by and controlled by the legislative and executive branches. And the focus of this study could not encompass this shift. Andrew has examined whether intelligence can function legally and ethically in a constitutional democracy; for the most part, he believes it has done so. How it functions in a democracy where the president's eyes are not the only ones that count is an important issue future historians will need to address.

(U) That said, this is a remarkable and provocative study, one that raises a host of interesting questions its author should attempt to answer in subsequent works. Any author who concludes, for example, that "The key to the main U.S. intelligence failures and successes is to be found as frequently in the Oval Office as in the performance of the intelligence agencies" would be well advised to consider that a theme for exploration. *Blurred Visions* would make a wonderful title, with chapters on "For Myopic Eyes Only" (the Bay of Pigs), "In the Eyes of the Beholder" (the Soviet brigade in Cuba), and "Tunnel Vision" (Vietnam, of course, though "End of the Tunnel Vision" would be more precise).

(U) Larger issues aside, the book contains wonderful tidbits. That Yardley found Wilson a cryptologic naif fits into the larger context of this president's career. Andrew's discussion of the Pearl Harbor conspiracy theorists should be yet another decisive step in putting paid to that silly business, though, virtually by definition, conspiracy theories cannot be laid to rest. He treats Roberta Wohlstetter's groundbreaking analytic device of "signals" versus "noise" in evaluating intelligence failure with appropriate deference, while noting that it hardly fits the event she was reviewing (Pearl Harbor), but would do nicely for an explanation of the failure to warn of the Tet offensive.

(U) Revisionist historians of the 1970s and thereafter will find Andrew's dispassionate, reasoned analysis of the "Red Scare" of the 1940s and 1950s disquieting. Yes, Joseph McCarthy and others exploited the issue, and Andrew raises the frightening prospects of the damage McCarthy could have done with all the facts at his disposal. There was, however, an active-aggressively so—Soviet espionage effort in the 1940s, and the familiar cast of characters who themselves or through their defenders have protested their innocence may have to face the reality revealed in the records of Soviet and American archives. In the end, Alger Hiss dressed better and had better teeth (and now has at least one

endowed chair named in his honor at an American college), but Whittaker Chambers told the truth.

(U) One discussion that should be read thoroughly by those entrusted with designing the SIGINT system of the future is that of the period between 1945 and the creation of NSA. If two cryptologic agencies were sufficient to muddle the situation in December 1941, we required four to accomplish an equivalent mess in 1950, with the invasion of Korea. Without being didactic about it, Andrew is clear in suggesting that intelligence is not an activity that can, especially in an age of instant communication, tolerate lack of coordination and purpose.

(U) The merits of this study makes some of its errors of fact and judgment all the more annoying. By common consent, SIGINT is used in back-formation to cover activities that took place where COMINT is actually the more appropriate term, but to extend the term to Civil War codebreaking is a bit much. It may be understandable that a British subject would think Congressional Country Club is in Virginia, but why should a credible author (British yet!) use Bletchley Park not only as a place of World War II cryptologic operations but as the name of the British cryptologic agency of the time? His stating as a fact that the National Intelligence Council has moved from CIA Headquarters reflects his access to a document that addressed the intent to make that change, but not later documents that would inform him it never happened.

(U) Early in the book, Andrew notes George Washington's injunction that intelligence is necessary and must remain secret. Juxtaposed to that is Andrew's obvious and professional desire to lift the veil of secrecy. "When NSA files for the Cold War period finally become available sometime during the twenty-first century," he concludes, "they are certain to generate thousands of doctoral dissertations and some interesting reassessments of American foreign policy."

(U) Clearly, there are those who will be uncomfortable with what Andrew has revealed in this volume. Some very interesting codewords, along with discussions of sources and successes, fill the book's discussion of SIGINT support to recent American presidents. Is it possible there may be a cost to such disclosures?

(U) Possible. But cost analysis alone proves nothing. The overall impression of SIGINT readers are likely to derive from this book is clear and simple: for

every president since Franklin Roosevelt, SIGINT has been an instrumental source of information. It is a core capability of the intelligence component of the national security apparatus. On a cost/benefit basis, especially at a time of fundamental national review of intelligence and security issues, an intelligent, balanced study by a fair-minded scholar like Professor Andreweemegges as a positive and timely contribution to public discussion of an important issue.

Chinese Intelligence Operations.

by Nicholas Eftimiades. Naval Institute Press, 1994.

Reviewed by

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(U) This book is an unusually valuable contribution to the literature on Chinese politics and Chinese intelligence operations. It stands apart from most of the scarce literature on the same topic. Drawing on his expertise as an counterintelligence analyst and longtime study of Chinese affairs, Eftimiades clearly reveals the structure, objectives, and methodology of Chinese intelligence operations, and how they fit into the conduct of Chinese internal affairs and foreign policy. The goal of this book, as the author states in his introduction, is to identify China's national intelligence structure, objectives, and collection operations, focusing primarily on human-source intelligence (HUMINT) operations. This book also provides some basis information about China's analytic community by identifying the roles and organization of major departments and agencies.

(U) In order to achieve his goal, Eftimiades divides his book into four major parts. It begins with an introduction, focusing on China's use of intelligence, the framework for analysis, and China's information objectives. Part Two basically addresses the structure and domestic and foreign operations of the Ministry of State Security (MSS). Part Three discusses China's intelligence community, mainly providing information about the Military Intelligence Department (MID) of the People's Liberation Army's (PLA) General Staff Department (GSD), and China's secondary intelligence organizations, such as the General Political Department (GPD), and the New China News Agency. Part Four is the conclusion, summing up the author's observation about the current capability and overall efficiency of China's intelligence services, and providing his views on the prospects of its future threat against the West.

(U) In theory and practice all intelligence activities, whether open or clandestine, are directed at either satisfying information requirements or covertly advancing national objectives. In this regard, Eftimiades is correct in believing the information objectives of the Chinese leadership differ significantly from those of global powers because of its unique strategic political and military concerns. In military terms the People's Republic of China (PRC) is strictly a regional power. For military intelligence purposes, the PRC directs its resources toward identifying potential regional threats: the Commonwealth of Independent States, India, Vietnam, Muslim states north of Xinjiang, the United States, Japan, South Korea, and Taiwan. Eftimiades also believes that the PRC has less of an interest in the global political-military environment than nations with worldwide military commitments. Accordingly, the PRC continues to focus its intelligence collection activities on issues that more directly affect its internal stability, regional security, and technological and economic development. However, since the fall of 1989 and as a result of global condemnation of China's Tiananmen massacre, Chinese intelligence apparatus have begun to focus on three specific strengths and weaknesses of the United States, targeting what the Chinese leadership perceive as the United States' "campaign of peaceful evolution." Consequently, the new information objectives target the positions on US-China relations advocated by American institutions such as executive branch agencies and members of Congress. And, overall, Chinese intelligence activities support its policy interests by acquiring dual-use foreign high technology, identifying and influencing foreign policy trends, such as bilateral policy and trade issues, and monitoring dissident

Chinese intelligence activities support its policy interest by acquiring dual-use of foreign high technology, identifying and influencing foreign policy trends, such as bilateral policy and trade issues, and monitoring dissident groups, especially those advocating democracy and Taiwan independence

groups, especially those that advocate democracy and Taiwan independence.

(U) It is logical that this book devotes much of its attention on the MSS and the MID, and to a lesser extent on the so-called secondary intelligence organizations, since Eftimiades' study restricts itself only to Chinese HUMINT efforts. The MSS is China's preeminent civilian HUMINT collection agency; and the MID, which is also known as the Second Department of the GSD, is China's second largest organization involved in HUMINT collection. It is in its careful and relatively detailed coverage and discussion of these organizations' structure, foreign and domestic operations in Parts Two and Three that this book makes major contribution to the understanding of China's HUMINT operations. The information on China's agent recruitment methods, training, and deployment is fresh and unique, and should be particularly useful to the counterintelligence specialists and interesting to all intelligence analysts in the China field. Much of this valuable information was derived from well-planned interviews with "Source no. 1" and "Source no. 2," and its worth betrays the significance of interviews, if conducted carefully, as a useful tool for extracting unique and hard-to-get information.

(U) Eftimiades has succeeded in achieving his goal for this book. By putting his information in the context of Chinese history and practice of espionage, and current information requirements in support of state policy, Eftimiades has provided a comprehensive picture of both the constancy and changes in China's intelligence services and operations. His book enhances his professional readers' understanding of the topic and sensitizes their appreciation of the present and future challenge posed by the Chinese intelligence services. Apart from his knowledge gained from many years of careful studying and observing China, Eftimiades' expertise as a counterintelligence analyst has enabled him to gain valuable information from various old and new sources, including interviews with Chinese diplomats, military and civilian intelligence officers, and secret agents. While he faithfully sticks to the framework and the goal he sets for this book, he does not let himself bogged down by excessive and often cut-and dry discussions of the structure of Chinese intelligence organizations. And, throughout his book, Eftimiades is mindful of the fact that the structure, operations, and methodologies of Chinese intelligence services reflect current intelligence requirements levied by the Chinese Communist Party

In spite of their inefficiency, China's intelligence services will become more sophisticated in the future and will be unaffected by Western intelligence and security practices

and its leadership, and that they would change in accordance with new requirements.

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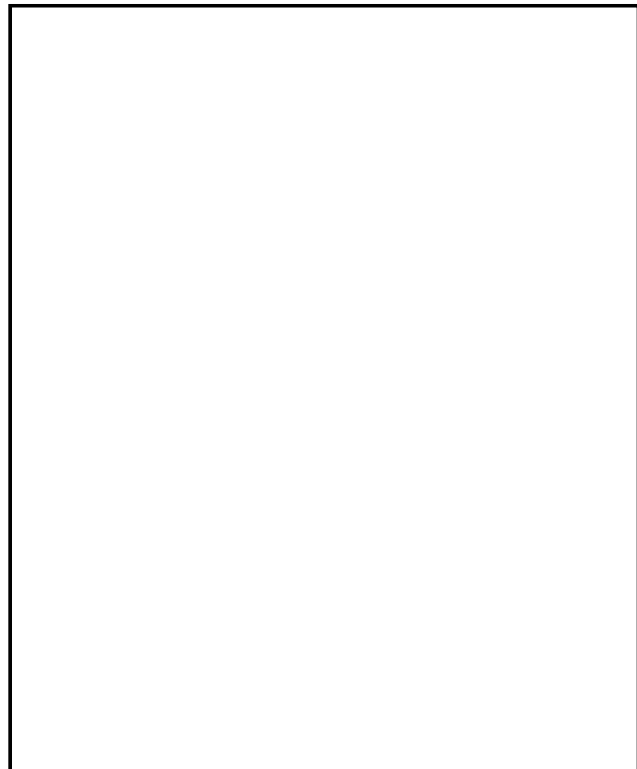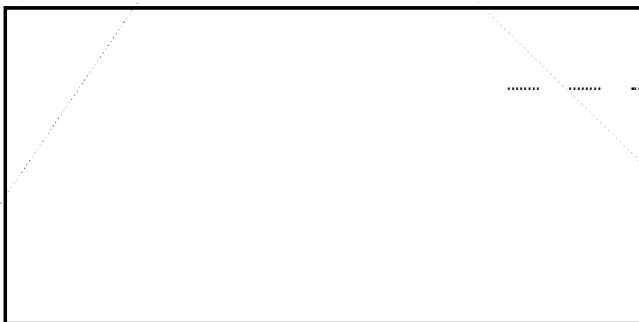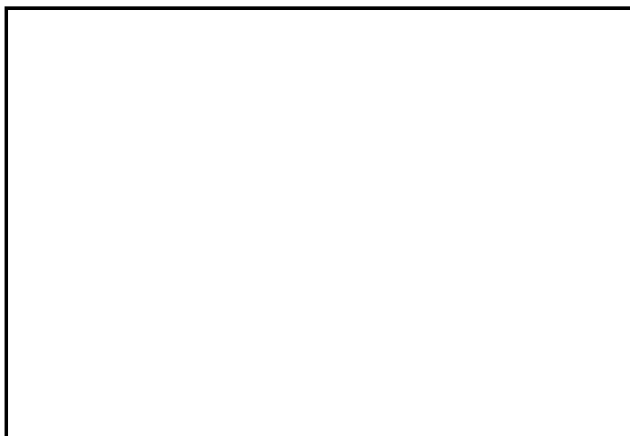## *SIGINT Glossary*

More Communications Analysis Trivia: The Chun Wheel

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(D) **Many analysts at NSA have fond memories of the Chun Wheel (and Chun Board)**, and the Center for Cryptologic History would like to hear your Chun story. Send your recollections about the Wheel's origins or use to dalratch@e3.cemsa.

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