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4788

12 SEP 1950

MEMORANDUM TO:



SUBJECT : Automation of Routine Field Reporting

1. At the request of [redacted] a meeting was held in the Office of the AD/CR on 5 August 1950 to discuss automation as a means of speeding up routine reporting from field stations.

2. The following points were discussed:

a. The time lag inherent in the forwarding by pouch of routine intelligence reports could be factorially reduced if automation were introduced into the reporting program at an early stage and continued throughout the forwarding system.

b. Automation systems adaptable to the intelligence reporting process are currently available. The problem of introducing these automation systems into the various established departmental field reporting activities is not so much a technical problem as an administrative one. It is difficult to persuade bureaucratic institutions to change established methods.

c. CIA, DD/P, has started to introduce automation into routine reporting on a small scale. The results of the experiment are promising and may lead to expansion of the use of tape punching equipment for the initial field typing of reports. Also, the CIA Office of Communications is experimenting with a high speed radio circuit [redacted] to Washington. This circuit will be able to pass the present total daily cable and pouch reports to Washington in about one (1) hour.

d. The Services have commercial contracts for studies on automation of information handling. The Air Force, in particular, is interested in the reporting problem.

**SUBJECT: Automation of Routine Field Reporting**

**3. The meeting concluded that:**

a. CIA use of "Flexowriter" tape punching gear in the field should be continued, and reviewed in the near future with a view toward its expansion.

b. CIA [ ] would provide a good proving ground for automation. This would require additional tape punching equipment and use of the experimental high volume radio circuit [ ] to Washington.

c. OCR will obtain pertinent Service reports on automation methods and study their applicability to CIA reporting.

d. As the CIA automation program progresses the departmental intelligence producers will be invited to participate.

4. Attachment A is a staff study on the volume and nature of interdepartmental intelligence reporting.

5. Attachment B is a staff study on CIA field use of "teletapes".

15/  
[ ]  
Chief, Special Intelligence Staff

**Attachments: 2 Staff Studies**

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**I PROBLEM**

To examine (1) the volume and nature of intelligence reporting from the field and (2) possible communications systems for electrical forwarding of the bulk of this material to Washington.

**II FACTS BEARING ON THE PROBLEM****A. The Volume of Current Reporting**

1. In 1957 approximately 560,000 information reports were received in DD/I from all agencies. Of these, about 400,000 were documents and 160,000 were cables and TICS reports.
2. CIA documents constitute roughly 20% of the document total, while CIA cables represent only about 1% of the total cable receipts in the DD/I.
3. State, ICA and USIA cables constitute roughly 89% of the total received and the military attache system 10% of the total.

**B. The Usage of Current Reporting**

1. State cables are the source for about 36% of the items in the Central Intelligence Bulletin (CIB). CIA cables, while extremely small volume, account for about 18% of the sources cited in the CIB. FBIS tickers account for about 15% of the sources cited in the CIB.
2. About 90% of the items contained in the Central Intelligence Bulletin are based upon material received electrically from the field. While this may to a great extent result from the accuracy of field selection of items to be sent by rapid means, there is no doubt that this greater utilization is also based to a large extent upon currency alone. This is borne out by the high utilization of FBIS and press material received electrically.

**C. Time Delays in Reporting**

1. According to the Department of State Schedule of Pouch Dispatches, the following approximate time delays are involved in the forwarding of reports by pouch (cities listed below were extracted as representing various areas of the world and do not represent the total listings in the source document):

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3. An estimate of the time delays involved in CIA cables would not be valid since they are reviewed in Washington and re-processed as TDCS reports before dissemination to consumers.

D. The Inclosure Problem

1. A significant proportion of documents contain attachments which are in the form of books, maps, photos, etc. While an accurate estimate is not available on all documents, about 16% of CIA reports have attachments. It is probable that military attache reports containing attachments may run as high as 50%, depending upon the area of the world. For example, Air Attache reporting will contain a high percentage of maps, photos and diagrams in areas where such information on the Soviet/Satellite area is available.

2. In addition to attachments, information reports containing internal diagrams, sketches and graphic material are steadily increasing in volume due to the increase in emphasis on scientific and technical subjects.

3. Reports containing attachments or internal graphic material can not, of course, be disseminated by teletype. Other means such as enciphered radio facsimile must, therefore, be studied for passing this type of reporting to Washington by rapid means.

III DISCUSSION

A. It appears that there are few technical communications problems involved in transmitting the bulk of field information by electrical means. An [ ] or other modern communications equipment, could quite easily transmit many times the current cable groupage out of foreign areas. There are, of course, areas where radio transmitters are not authorized and other areas where reporting volumes, power shortages and real estate inadequacies would preclude an [ ] type facility. In these areas commercial radio or wire facilities, if available, could be used to relay traffic to an [ ] field center.

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B. The installation of an [ ] center in a foreign area would, however, be just a beginning. In order to capitalize on the efficiency of this equipment, outstations would have to be tied in with the [ ] center by rapid means - radio or wireline communications with on-line enciphering methods. Since the use of the [ ] has been suggested for the rapid passing of information, each outstation would have to streamline its operation to ensure that the flow of information would not suffer undue delay before reaching the [ ] field center. Outstations, therefore, would require a sufficient number of "Flexowriters" so that teletype tapes could be made simultaneously with the typing of reports and it is possible that 24 hour standby of communications facilities would be required.

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C. The Washington end of the system would, of course, present a large problem since extensive modification of present methods and equipment would be required. The initial selection of material for dissemination in accordance with the unique requirements and priorities of individual consumers becomes one of the first considerations. One way of doing this would be to employ an NSA-type system - that is, the field station would determine the ultimate distribution of items it reports and would punch the appropriate routing instructions in the teletype tape which it produces. Upon receipt in the Washington center the cables would be scanned electronically and routed automatically to ultimate consumers. A system such as this is feasible technically and would ensure almost immediate delivery of field items to users. The difficulties which such a system poses are fairly obvious:

1. DD/P cables, for example, are now screened as TDCS reports. The concept of a field station sending its cables to users without an intermediate review would require a fairly drastic change in policies and procedures. This would no doubt make it essential for field stations to perform reviews of material in terms of certain criteria before transmission in order to determine if the material is "end-product" or "operational" data.

2. The Washington center would have to be alert for cables with security and dissemination restrictions such as "CIA Internal Use Only".

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3. An automatic center in Washington would require that individual consumers be equipped with sufficient equipment to handle anticipated peak traffic loads. The expense of such installations would be considerable initially.

4. A system as described would suggest that collection and consumer agencies in Washington increase their 24 hour operations to the point where "after hours" receipts are assured immediate analysis and utilization.

D. Instead of an automatic system for the scanning and routing of incoming cable traffic, a conventional message center system could be used. The message center would determine the handling of incoming messages based upon the precedence placed upon the message by the field originator. In handling large volumes of material, however, the message center should be backed-up by a group of analytic personnel who scan each incoming piece and recommend both recipient and priority of delivery. This would be essential since it should not be assumed that precedence indicators on traffic are always an accurate measure of the importance of a message. Such a system would be most efficient if both the message center and analytic functions were located in one central point. The analytic scanning function would probably be most effective if it were 24 hours a day and if all primary intelligence agencies were represented in the area. It should be pointed out that the system very generally described here is essentially the system which NSA used before it converted to automatic scanning and routing devices.

E. 1. The discussion above has been devoted to the electrical forwarding of printed words. However, a large percentage of information reports contain diagrams, charts and sketches which cannot be sent by teletype, but which are responsive to higher priority scientific and technical requirements. Since this material must be forwarded to Washington consumers as expeditiously as printed words, radio facsimile becomes an important area of consideration. It may in fact be feasible to send all field reports, not just those with graphic material, to Washington by enciphered radio facsimile and thus eliminate the punching of teletype tapes and other related procedures connected with teletype.

E. 2. The United States Communications Intelligence Board has for several years considered the enciphered radio facsimile program (CIFAX). USCIB paper 13./42, 9 July 1956, reported the following summary of CIFAX developments:

a. TSEC/KX-3 and TSEC/1 - N-73

These two equipments together comprise a secure facsimile terminal of a point-to-point HF radio circuit.

(1) KX-3 - Facsimile Security Equipment

Service test models are being procured now at an approximate unit cost of \$16,000.00. These will be available during the 3rd quarter Fiscal Year 1957. Additions to this contract will provide delivery in the 4th quarter FY 57. This item will be available for production early in FY 58 with first deliveries from production probably in 2nd quarter FY 59. Cost about \$13,000.00.

(2) NN-73 - Transmission Preparation Equipment

(1 required per KX-3 installation half or full duplex) 2 units each 33 1/2" x 26" x 17 1/2" may be stacked to form 1 unit 67" high - 765 pounds.

100 - 130 v 45-65 cps. 17.5 amperes

Service test models currently available. Additional models are currently being produced. The NN-73 will be procurable at the same time as the KX-3. Unit cost \$17,000.00.

b. TSEC/KG-3 and TSEC/NN-3

These two equipments are essentially improved and subminiaturized versions of those listed in sub-para a. and also comprise a secure facsimile terminal of a point-to-point HF radio circuit.

(1) KG-3 - Key Generator (Useable as Facsimile Security Equipment Transceiver)

18" x 18" x 18" 50 pounds

115 v 60 cps 0.9 amperes

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presently under development. Service test models should be available by end of FY 58. Procurement should start about mid FY 59 with deliveries about mid FY 60. Unit cost about \$9,000.00.

(2) NM-73 - Electronic Signal Conversion Equipment for Radio Transmission (1 Required per KG-3 installation).

18" x 24" x 48"                      300 pounds

115 v                      60 cps              1.8 amperes

Presently under development. Service test models should be available by 2nd quarter FY 59 with deliveries from procurement starting about the end of FY 60. Unit cost about \$12,000.00.

c. TSEC/KX-5 - Broadcast Facsimile Security Equipment

(1 system requires 1 transmitter or 2 for 100% standby and any number of receivers)

Transmitter - 2 bags of each 18" x 24" x 48" - 780#  
Receiver - 1 bag each 18" x 24" x 48" - 390#.

Transmitter - 115 v 60 cps 16 amperes  
Receiver - 115 v 60 cps 11 amperes

Presently under development. Service test models should be available toward latter part of FY 59 and procurement deliveries starting about FY 61. Transmitter unit cost about \$20,000.00. Receiver unit cost about \$10,000.00.

25X1 III A PILOT STUDY

A. The statistical data necessary for a study of the cost and feasibility of establishing a world-wide electrical forwarding system is not available. In view of the expense and time involved in gathering such data, it was determined that a pilot study of an important, high-volume reporting area could be used as a sample for the measurement of the probable benefits of an all electric reporting system. The  area was selected because of its importance, the high volume of reporting, and because relevant data was already partially compiled.

25X1 B. The details of the survey of intelligence reporting by all U. S. agencies  during October 1957 is shown in Tab C. Estimates of total wordage out of this area from all agencies for the year 1957 is shown in Tab D. A summary of reporting statistics follows:

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1. An approximate total of 1,757,000 words were contained in reports issued in October 1957 by all U. S. agencies [redacted] (This figure includes the word count of attachments to CIA documents only. Attachments to other agencies' reports are not always available to CIA).

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2. An approximate total of 114,000 words were contained in intelligence cables issued by all agencies.

3. About 50% of military reports had attachments.

4. About 29% of CIA reports had attachments.

5. About 14% of State reports had attachments.

C. The Office of Communications, CIA, is preparing a pilot plan for the electrical forwarding of all U. S. intelligence [redacted] based upon a common-user radio, high-speed teletype installation [redacted]

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D. In addition, Office of Communications is preparing a pilot plan for the forwarding of all U. S. intelligence from [redacted] based upon a common-user enciphered radio facsimile installation [redacted]

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HIGHEST SINGLE MONTH CABLE VOLUME  
(Based on DD/I Receipts)

<u>SERVICE</u>	<u>1956</u>	<u>1957</u>
CIA	662	230
State	11,057	9,905
Navy	923	1,257
Army	919	486
Air	690	291
ICA	8,636	4,792
USIA	469	329
<b>TOTALS</b>	<b>23,356</b>	<b>17,290</b>

Totals are hypothetical examples of number  
of cables which might be sent if all agencies  
"peaked" in the same month.

CIA DOCUMENTS & CABLES RECEIPTS  
FROM ALL AGENCIES  
(Based on DD/I Receipts)

	<u>1956</u>	<u>1957</u>	<u>1958</u>
Documents	340,188	402,060	380,000)
Cables	204,745	160,158	160,000) <sup>estimated</sup>

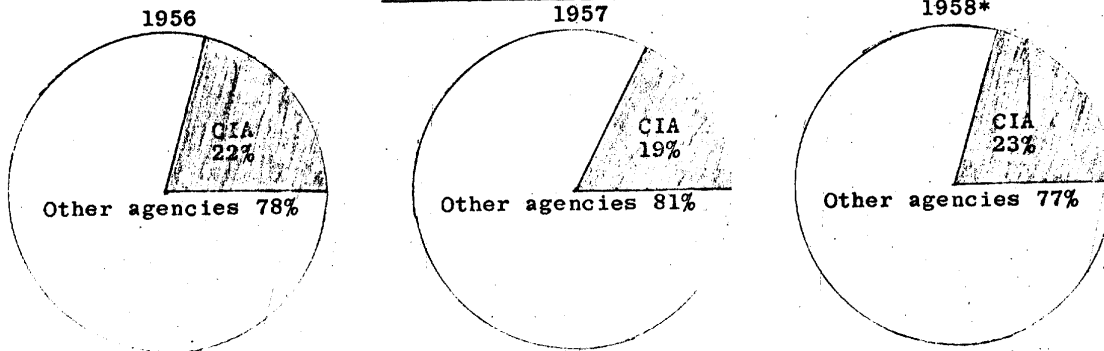
7/11/10

1. COMPARISON OF CIA AND OTHER AGENCY  
DOCUMENT (Based on DD/I Receipts)

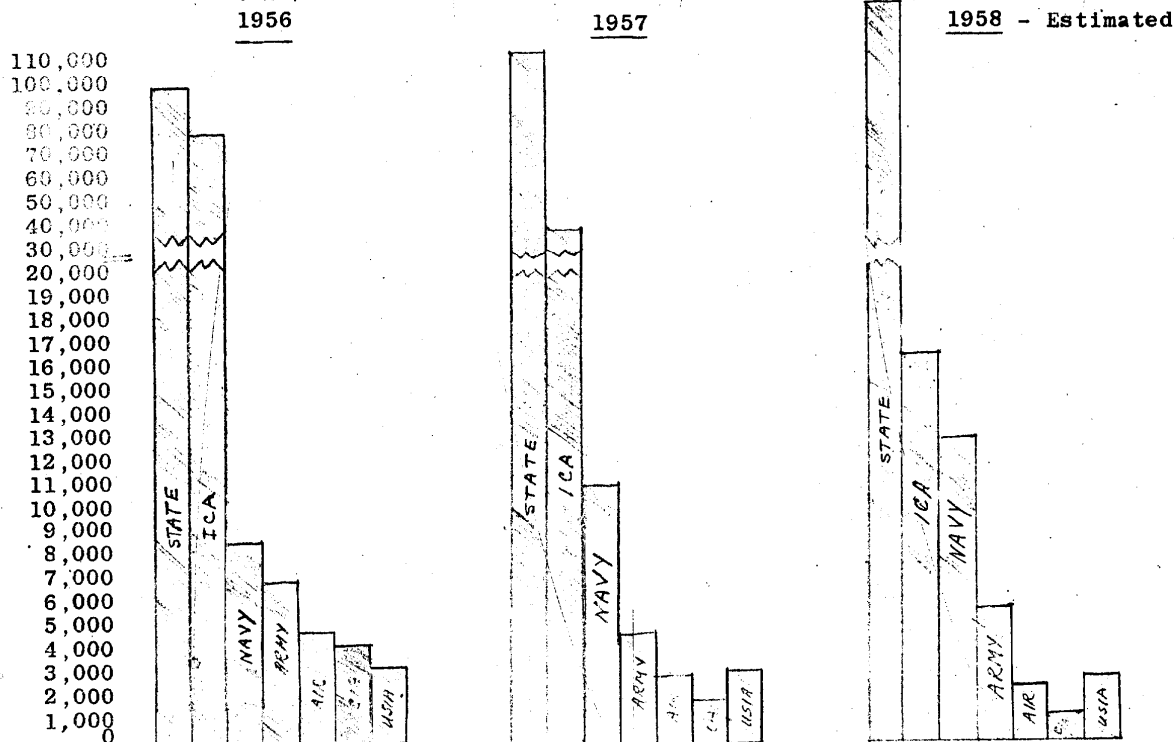
	1956	1957	1958*
CIA	60,840	65,304	72,000
Other Agencies	279,348	336,756	305,160

\*Estimate based on Jan, Feb, Mar & Apr 1958

PERCENTAGE COMPARISON



2. DD/I CABLE RECEIPTS FROM ALL AGENCIES



NOTE: CIA Cables constitute only about 2% of DD/I receipts.  
State and ICA Cables, 83%.

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## SURVEY OF INTELLIGENCE REPORTING

OCTOBER - 1957

DOCUMENTS

<u>Service</u>	<u>Total Words</u>	<u>Average Words Per Page</u>	<u>% Reports Bearing Enclosures</u>
Air	808,800	200	50%
State	618,000	400	14.3%
CIA	244,440*	420	29%*
Army	58,200	400	40%
Navy	17,750	125	50%
USIA	8,000	400	
ICA	1,000	200	
TOTAL:	1,757,190		

\* Word count includes inclosures.  
(Other Agency figures DO NOT,  
since not all inclosures received  
in CIA)

CABLES

<u>Service</u>	<u>Total Words</u>	<u>Average Words per Page</u>
Air	20,628	210
State	81,840	264
Army	8,602	352
USIA	2,265	242
ICA	770	264
Navy	None	
TOTAL:	114,105	



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8 July 58

TELETAPESI. PROBLEM

1. To determine whether Teletapes represent a feasible means of rapid communication with field stations and, if so, to recommend appropriate action to utilize Teletapes.

II. BACKGROUND

2. For years the Agency has been seeking ways to improve and speed up field communications without overloading and overexpanding cable facilities. Efforts have followed two lines principally: speeding up pouch handling and transmission; and reducing cable traffic by better selection and editing of cable material. Educational programs and drives to cut cable traffic by writing shorter, "tighter" cables have helped but have usually been conducted in the face of a steadily mounting volume of cables. Attempts to speed up pouches (all of which go thru State or Defense Channels) have had varying success. A "fast pouch" service to key cities in Western Europe was tried for six months in 1954 and did cut pouch time considerably. Speed was based on: (a) "cable handling" of fast pouches at originating and receiving installations, and (b) transmission by special couriers. The latter proved too costly, however, and the service was abandoned. Recent moves by RI to streamline handling of incoming pouches and to eliminate processing of administrative dispatches greatly improved pouch time for a while. But this advance was offset by the decision in April 1958 that all Agency pouches must be transmitted via TOP SECRET (courier accompanied) channels which are generally much slower than other channels. This decision brought about an acute communications problem for stations where courier service is infrequent, particularly in the Near East and Far East.

3. In early 1958, prompted by a suggestion from the Chief of WE, the Machine Methods Unit of DDP (100J) began studying whether "Teletapes" might provide the means for a secure "fast pouch" less costly than the system used in 1954. Members of other Agency components with whom the idea was discussed were encouraging. Several even intimated that "Teletapes" might help pave the way for some really sophisticated communications techniques involving high speed electronic transmission and automatic mechanical reproduction and dissemination. "Teletapes" are narrow paper tapes produced as a typing by-product by a 5-channel Flexowriter (or similar machine.) These tapes can be converted by a mechanical commo device into encrypted tapes that can be treated as "unclassified." Such tapes can later be decrypted and their contents reproduced mechanically into exactly the same style and form as the original typed product.

4. 100J had 14 Flexowriters (available from a completed records project) and had already started a test of Teletapes between Washington [redacted] when the decision was announced that all Agency pouches

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containing ~~SECRET~~ SECRET material would have to be transmitted via TS channels. This development greatly accentuated the need for "fast pouch" service and caused DDP and DUS: (a) to launch an immediate move thru the Management Staff to have State augment its courier service, [redacted] and (b) to ask that the study and testing of Telstapes be accelerated with a view to their early employment wherever feasible.

5. While approving the experimental Telstape links between Washington [redacted] the Office of Security arranged to test the equipment involved from a security point of view. Pending the outcome of these tests, tapes (although "unclassified") are to be transported by APO registered mail.

### III. DISCUSSION

#### 6. GENERAL

a. To be feasible, Telstapes must save enough money (when used in lieu of cables) or enough time (when used in lieu of dispatches) to warrant the cost of equipment and personnel - machine operators and couriers - required to provide the facility. While cost factors may be hard to measure accurately, some reasonable conclusions ought to be possible after Telstapes are tested in volume for at least 2-3 months at 3 or 4 selected stations.

b. To utilize Telstapes, a station must have the commo equipment and service needed to encrypt and decrypt the tapes mechanically. It must have facilities available to repair the [redacted] Flexowriters supplied by Washington. And for the tapes to be profitable, there must be a means - unclassified pouch, APO, open mail, or air freight - for transporting the tapes to and from Washington (or laterally between stations) at rates of speed significantly faster than TS pouches move.

#### 7. CABLE AND DISPATCH TRAFFIC BY STATION

As a first step in determining the feasibility of telstapes, it is desirable to know the volume of communications originated and received by the major field stations. Tab A contains this information for cables, Tab B for dispatches (tho the periods covered by the two studies are not identical.)



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9. APO FACILITIES

Many stations have local APO facilities. Tab D lists them. It is possible that APO mail service may be faster to some of these posts than unaccompanied pouches. And, while APO mail does not have diplomatic immunity, it is free from foreign customs and intercept problems.

10. COMMO CAPABILITY

Teletape produced by a Flexowriter is basically the same as the tape produced by a Teletype machine. The latter is standard equipment at all posts where commo work is done mechanically instead of manually, and all such Teletype machines are serviced by Agency employees. Thus, the commo capability to process Teletape exists at all important posts, though machines and personnel may have to be added in some instances to handle the extra load.

11. FLEXOWRITERS

Tab E lists the stations where Flexowriters parts and service are available locally. Stations lacking such facilities may be able to arrange for Commo technicians to service their machines or perhaps air ship them to some other station [redacted] for repair.

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12. TESTS RESULTS TO DATE

The test link [redacted] has permitted a number of developments in the Teletape system to move along even though volume has been light and expansion held in abeyance pending Security's approval. [redacted] was chosen for the test because it had the facilities and trained personnel to experiment with Teletape under

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reasonable security conditions and to cope with novel procedural, ~~com~~ and other problems that had to be ironed out. [REDACTED]

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a. PROCEDURES

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b. EQUIPMENT

Complete compatibility between the Flexowriter and Teletype equipment used by Commo has been demonstrated. Subject to Security's findings, the equipment presently used in the Teletape system appears to be quite satisfactory. Some modifications and improvements will undoubtedly be made as time goes on. For instance, the keyboards of the two machines are not identical, nor do they operate at precisely the same carriage return speed. But these are minor problems easily reconciled.

c. PERSONNEL

A small cadre of persons in Washington [REDACTED] have become thoroughly familiar with Flexowriters and Teletape during the test period. Their knowledge and the techniques they have developed can quickly be passed along, permitting the system to be expanded as rapidly as available equipment and circumstances warrant. A well trained typist using only written instructions can learn to operate a Flexowriter within a very short time. And any Commo technician who can operate a Teletype machine can process Teletape within a few hours.

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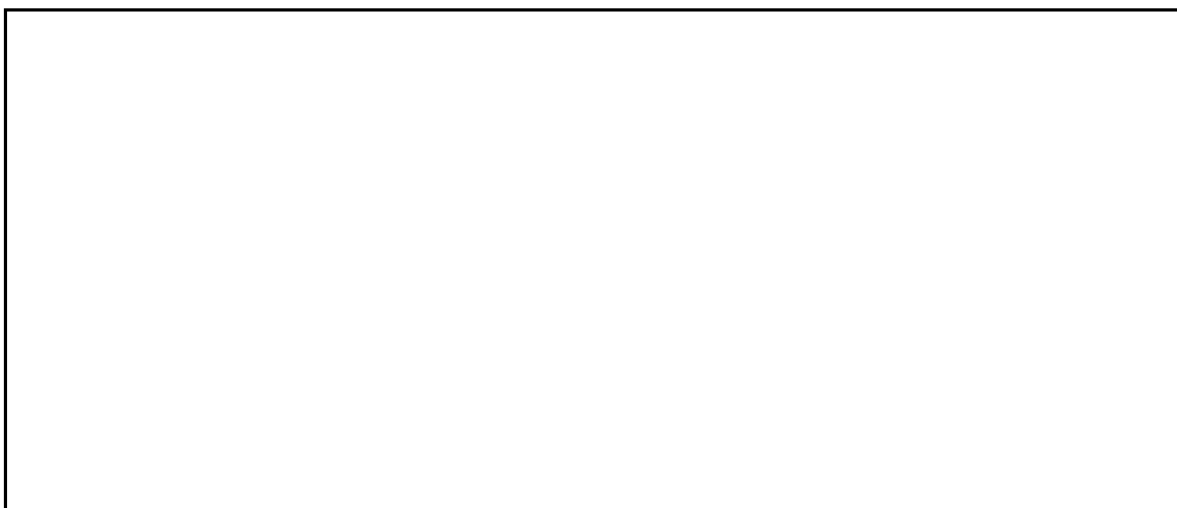
13. FUTURE PROSPECTS

a. NEAR TERM

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At the outset, limitations of equipment will determine the extent to which Teletapes can be used. Only 14 Flexwriters are available and replacements (costing \$3,000 per machine) have to be tailor made. Total lead time is about 4-6 months. Some stations have enough slack in their Commo units to handle Teletapes without adding machines or people. Other stations are not so situated. Teletype machines, modified to "break back" tapes as they are encrypted, cost about \$4,500 and lead time runs several weeks.

#### b. LONG TERM

The long term prospects for Teletapes - or a system employing similar principles - look highly promising. Once procedures are developed and persons become accustomed to the fact that originators can type their messages on machines which in the same operation produce small tapes that can be encrypted, decrypted, reproduced in multiple copies and disseminated - all by fast automatic mechanical processes - then some exciting possibilities appear. By adding Ultra high speed electronic transmission (which is already on the horizon), a system can be developed that will handle most, perhaps almost all, field communications at extremely high rates of speed and yet at reasonable costs and with a moderate sized Communications staff. Moreover, such a system can easily be linked to other Agencies in the intelligence community at whatever points and to whatever degree may be desired.

#### IV. CONCLUSIONS

14. Any conclusions at this point must necessarily be tentative. But it appears that Teletapes do represent a feasible means of rapid communication with many stations - using air transportation of tapes.

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It is too early to judge exactly where they should be used or exactly how they should be transported. In general, their use will be most profitable in the Near East and Southeast Asia and least profitable in the Western Hemisphere. Transportation by unclassified diplomatic pouch, and to a few points (where major military headquarters are located) by APO mail, look like the best answers. Air freight and international mails could conceivably be made to work a little faster, but they present customs and intercept problems which may be hard to lick and in most cases may hardly be worth the try. As for the use of Teletapes in combination with ultra high speed methods of electronic transmission, such a system, in my judgment, is certain to be employed in one form or another within the next few years.

15. The introduction of teletapes at new locations will not be entirely without problems. Flexowriters are quite noisy and will usually have to be put in sound conditioned rooms or cubicles. Few typists will want to work full-time with such a machine. As the program expands, money will have to be found for new equipment. Commo says it will need more people at post stations to handle teletapes in quantity. And with any really sizeable flow of teletapes, important coordination and dissemination problems will have to be met.

16. To really judge the value of teletapes in our present situation, more information is needed. To get it, all 14 Flexowriters should be put to work and at locations calculated to yield the best results. As soon as Security gives the green light, the following actions should be taken:

a. Arrange with State to transport Teletapes via diplomatic pouch.

b. Arrange to transmit Teletapes via APO, using the Defense Post Office (Pentagon) as a drop-off and pick-up point.

c. Select two or three stations [redacted] and install the Teletape system there. Preferably, one of these should be a station where two Flexowriters can handle at least 50 percent of the total dispatches originated there.

If early results of this expansion demonstrate the value of Teletapes, or at a minimum indicate the wisdom of expanding further on an exploratory basis, then additional machines should be purchased and new stations brought into the system. This is a suggested phasing for any such moves. Money to buy additional machines should be supplied by the using elements.

As an integral part of the testing process, experiments should be carried out with each user station to determine the

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tested means of transporting tapes. Studies should also continue locally and at user stations to improve procedures and techniques and to arrange optimum courier and processing schedules.

**V. RECOMMENDATIONS**

17. Recommend, subject to Security's approval, that the actions suggested in paragraph 16 be taken and the Teletape program expanded to the full limit of the 14 Flexewriter machines now on hand.

18. Recommend that additional expansion be held in abeyance, or proceed most cautiously, until the program has been going long enough (probably two-three full months of operation) to yield meaningful results which can be evaluated and reported to appropriate authorities for further action.

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