

REVIEW OF TELECOMMUNICATIONS
TECHNICAL SUPPORT CAPABILITIES
FOR THE NATIONAL GUARD OF PANAMA

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Alfred W. Naurocki
Telecommunications Advisor
Public Safety Division
USAID/Guatemala

Principal Officials Contacted

Mr. Alex Firfer	Mission Director, USAID/Panamá
Mr. Adolph Saenz	Chief Public Safety Advisor
Col. Thomas Austin	Commander, U.S. Military Assistance Group/Panamá
Capt. Juan J. Salamanca	Chief of Communications, National Guard
1st.Lt. Felindo Flores	Chief of Maintenance, Communications Division, National Guard
1st.Lt. Mariano Cano	Chief, Special Technical Assistance Group, Communications Division, National Guard
Sr. Alberto M. Tapia Champaur	Chief, International Teletype Section, National Guard

References

1. "The Republic of Panamá Guardia Nacional Telecommunications Survey Report" August 1963, by Thomas L. Moody, Public Safety Advisor, OPS/AID/W.
2. "Panamá Telecommunications Review" April 1969, by Alfred W. Naurocki, Telecommunications Branch, OPS/AID/W.
3. "Panamá Telecommunications Review" July 1970, by René Tetaz, Telecommunications Branch, OPS/AID/W.

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I N T R O D U C T I O N

The basic purpose of this study is to review the effectiveness and capability of the National Guard of Panama to technically support its telecommunication networks and associated equipment. The growth in use of all types of communications equipment by the National Guard has been extensive. This increase has been initially spurred by AID Public Safety and military assistance programs in earlier years, but more recently by the Government of Panama itself through direct equipment purchases from U.S. and other country suppliers.

Shortly after the October 1968 military coup and Junta rule in Panama, the National Guard began to closely examine its various needs for improved material and personnel levels. Subsequent events related to political leadership disputes in December 1969, have given a further impetus to sustain a well-equipped force for preserving the internal stability of the Republic. Adequate National Guard force and material levels on October 1972 contributed to the peaceable selection process for a President and Vice-President by the National Assembly under the approval and support of the Commander-in-Chief of the National Guard.

The various organizational units of the National Guard, including its Air Force and Navy, have correspondingly benefited by larger public expenditures in the governmental sector, made possible to a large extent by the economic gains exhibited by the private sector.

The Communications Division of the National Guard, which operates and maintains radio, telephone and teletype systems to serve the needs of the entire institution, has likewise augmented the quantity of radio equipment it uses and the services it provides. The effectiveness of this organization to fulfill its functional purpose in this specific area is examined within this report.

This study was performed during February 7-23, 1973 by Alfred W. Naurocki, Telecommunications Advisor, Public Safety Division, USAID/Guatemala.

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I. SUMMARY AND CONCLUSIONS

The National Guard of Panama has expended a sizeable amount of its own fund for telecommunications equipment and services. These purchases, over the past few years, have included both civil police and military-type radio equipment from U.S. as well as foreign suppliers. The majority of equipment used for the various radio networks are commercial types typical for civil police purposes. The use of both civil police and military-type radios is consistent and compatible with the broad internal security responsibilities of this organization.

It is in the interests of the U.S. Government to continue to have the National Guard assume the costs of purchasing the communications and other equipment it needs to effectively function. However, the technical expertise needed to assure that knowledgeable evaluations are made regarding the value and performance characteristics of the equipment prior to its purchase are notably lacking within the institution.

With the exception of the new traffic control radio system, the majority of equipment which has been purchased has served to only expand the quantity with little regard to upgrading the flexibility, usefulness, or technical performance of the different radio networks.

The technical support of radio communications equipments from a maintenance standpoint is generally poor. Inadequacies are reflected throughout in all phases of the maintenance organization and its procedures. Deficiencies are evident in the lack of professional maintenance techniques, the supervision and internal training of technical personnel, clearly specified work assignments, equipment and spare parts control records and overall shop administration.

The physical working area within the radio maintenance shop is small and congested considering the quantity of equipment which periodically requires repair. The current shop is in a temporary location pending finalization of a new location which will serve as a combined maintenance area. Formerly, maintenance of base station and other heavy units was independently organized and operated apart from a mobile/portable repair shop. The Chief of the Communications Division proposes to merge these two sections into a unified group to avoid duplication and non-coordinated functions between the two.

The present Chief of the Communications Division has been in his

assignment for about three months and admits to no prior experience in the telecommunications field. While apparently capable of general supervisory duties, he is aware of his own limitations in fully understanding the various operational and technical tasks within the jurisdiction of the Communications Division. This particular official has nevertheless recognized that there are certain deficiencies in his area of responsibility which are difficult to resolve internally given the present capabilities of his personnel. This official has thoughtfully considered and expressed the desirability of receiving full-time direct U.S. advisory assistance to actively participate in the improvement of the telecommunication system and to properly structure and to mature the entire technical support mechanism within the Communications Division.

It is concluded that U.S. technical advisory assistance in the telecommunications area would be beneficial to the healthy long-term development of this important organizational element. Periodic TDY reviews, reports and recommendations, while accepted practice for rectifying specific minor problems as may exist at the time, would be of limited value in this case since nurtured guidance on a daily basis is required for a longer term to resolve their more ingrained difficulties.

It would be advantageous for the National Guard to have access to an on-the-scene competent advisor. They have never been offered this category of specialized assistance by the USAID Mission. The assignment of a USAID Public Safety Telecommunications Advisor is recommended for a minimum period of three years as a positive first step to advance the present limited capabilities in technical support effectiveness.

The equipment and materials provided to the National Guard's Communications Division by USAID Public Safety and the military assistance program have been of considerable value to them. With the National Guard undertaking more purchases with its own funding, the equipment grant portion of USAID assistance can be correspondingly reduced. Participant training at various technical schools and the provision of training materials should be continued. In the absence of a full-time telecommunications advisor, short-term TDY specialized assistance should still be continued as may be necessary although a direct-hire advisor is to be preferred for the inter-related range of tasks that normally require regular attention and guidance.

II. GENERAL SITUATION

The National Guard has gradually increased over the past several years the quantity and variety of radio equipment used by its forces. This increase has been achieved mainly through an expenditure of their own funds and has generally helped to expand communications capabilities.

In comparison to the findings available during a 1969 review of the National Guard telecommunications system (Reference 2), additional communications improvements initiated since then have been noted as follows:

- A. A new large-capacity central telephone exchange (PABX) plant has been installed to serve National Guard central headquarters. This replaces an earlier vintage model to allow a greater flexibility in accommodating internal and incoming telephone traffic.
- B. The Communications Division operates and administers a new international teletype section for in-country and worldwide printed message communications. Teletype equipment terminals are leased from each of the three major common carrier telecommunication companies within Panama, i.e., Western Union International, Tropical Radio Co., International Telephone and Telegraph Co. A separate private teletype circuit is also available to the National Guard headquarters in David. A civilian supervisor with twelve years experience in commercial teletype practices administers this international teletype section.
- C. Closed circuit television cameras are now in use to view the main outside entry gates to central headquarters.
- D. The National Guard unit in each capital city of the rural provinces has been equipped with a high-frequency single-sideband radio set to permit direct communications with National Guard central headquarters in Panama. Certain rural towns also have installed short-distance VHF-FM communications equipment for National Guard contacts within a province.
- E. A new traffic control radio communications system with a modern control console purchased from Motorola by the National Guard at a cost of \$150,000 is currently undergoing installation in the Traffic Division by local representative:

Other annual expenditures by the National Guard for communications

equipment and related supplies have been substantial as noted by other observers:

" In FY 1968 and 1969, a total of \$80,000 was spent to procure 10 SSB transceivers and 50 portable SSB transceivers. An amount of \$25,000 was spent on construction, repair shops, locally-built towers, antennas, furniture (desks and chairs).

In FY 1969 and FY 1970 a total of \$52,000 was spent to procure General Electric and Motorola base stations and mobiles.

The above totals \$157,000 over a three-year period and exceeds the AID support provided." 1/

The majority of equipment acquisitions have been made to basically satisfy the short-term individual requirements of various operational sections within the National Guard. As such, the purchases have consisted of increasing the equipment complement per se, with little forethought to satisfying the overall interrelated telecommunications system requirements.

At present, the National Guard lacks a knowledgeable individual within its ranks who can act as a central technical planner for assuring that equipment considered for purchase relates to the functional requirements of each user element as well as the overall integrated communications scheme. The official who formerly was the Chief of the Communications Division had over ten years experience in this field and was capable of providing the necessary guidance. The replacement of this official with an inexperienced, less-qualified individual has significantly diminished the National Guard's potential for self-guidance in such planning.

A typical case in point is the difficulty the technicians have had to establish a dependable VHF-FM radio contact direct to Colón from Panama central headquarters. Of many types of equipment procured in the past, none has been satisfactory to satisfy this particular case. It is further contemplated to eventually extend the rural highway patrol radio network along the highway presently under construction through the Darien region. To assure a feasible approach and correct equipment selection for this purpose, it is probable the technicians will seek outside advisory

1/ "Panama Telecommunications Review", pp 9-10 by René Tetaz, July 1970.

assistance. It is likely that the selection of various types of foreign-made radio equipment as purchased from France and Israel could have been directed to equal quality U.S. equipment sources had some on-the-scene technical advisory assistance been available on a full-time basis to the National Guard. 2/

While assistance on specific communications problems was periodically provided by TDY specialists, such short-term assistance was of limited value to assure satisfactory full-time on-the-scene guidance for longer term communication planning, equipment selection and implementation supervision.

The assignment of a direct-hire Public Safety Telecommunications Advisor to the USAID/Panama Mission should be given thorough consideration to enable the National Guard to overcome some of the above-mentioned fundamental difficulties.

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- 2/ a. Approximately 60 units Model PRC-77; U.S. Military-Type, Tactical VHF-FM tuneable 30-75 MHz.; with mobile and back-pack accessories.
- b. Six units Model RT-794B; U.S. Military-Type, Tactical HF-SSB with USB channel only; tuneable 2-12 MHz.; with accessories.

U.S. Military Tactical Units of a. and b. manufactured by Tadiran Israel Electronics Industries, Inc.

- c. Approximately 60 ea. HF-SSB Portable Radio Single-channel 6842 KHz. USB/LSB Selectable.

Made in France by CFTH (Thompson).

III. TECHNICAL SUPPORT OBSERVATIONS

A principal responsibility of the Communications Division is the maintenance of all radio equipment used by the National Guard. The Maintenance Section with its technicians, test equipment, specialized supplies and shop area is an integral part of the Communications Division. The structure of the Maintenance Section is shown in the attached organization chart.

An effective maintenance program was found to be lacking for the National Guard. Loose organizational controls, haphazard working arrangements and inadequate technical skills of most technicians were the dominant cause for this deficiency. Contributing in part, is the lack of experience of the official recently appointed as Chief of the Communications Division, in telecommunications management, especially in the area of establishing and guiding a strong technical maintenance section.

The National Guard does recognize the need for having good maintenance performed on its communications networks although the various new equipment procurements during the past several years have muted the pressures for servicing some of the older dead-lined units. New equipment has replaced those items which have been beyond the scope and capability of the average technician to properly repair. The technicians have been able to effect most repairs at a first and second echelon level. It is most infrequent that sufficient attention is directed to the detailed analysis and servicing of more complex equipment malfunctions. This is due to the continuous activity in the movement of technicians to install, remove, or change various equipments as requested by different officials to satisfy various specialized operational functions.

The Communications Division is allowed sufficient funds for purchasing spare parts and accessories as available through local commercial outlets. Much of these funds are unnecessarily dissipated through replacement of an excess quantity of parts that have no relation to the defect in the particular item under repair. In general, the impression received is that additional monies are available for new equipment purchases, the attention given to efficient and economical maintenance practices has been correspondingly reduced in importance.

Stock control records of spare parts usage, equipment maintenance records, technician work orders and other administrative control measures pertinent to radio shop organization and management are not in effect. An annual summary of major radio equipment on hand

is undertaken, but in a perfunctory manner that omits any explanation for the differences in equipment quantities from prior years.

A limited quantity of functioning test equipment is on hand. The quantity is insufficient, however, for thorough servicing of radio units. Other items of useful test equipment are non-operative due to mishandling, ordinary defects and at times, some abuse by inexperienced personnel. The National Guard is capable of purchasing those replacement items of test equipment they deem necessary.

A significant development is the proposed intent of the new Chief of the Communications Division to unify the fixed radio station maintenance group and the mobile/portable radio maintenance group. These two groups formerly operated independently of each other, with their own technicians, test equipment and shop space, resulting in little coordination and considerable duplication of resources. This was a long-standing recommendation of the USAID Public Safety Division regularly submitted over the years to the National Guard Command. A newly-refurbished area is planned to centralize all future radio maintenance functions in a ground floor building within the Central Headquarters compound.

Two officials currently concerned with radio maintenance have received training earlier in France and Israel, at the factories of the suppliers. This has been directly beneficial to the two officials but their knowledge was not adequately transferred in turn to other lower-level technicians also concerned with repair of the same equipment.

Additional training is projected for two National Guard technicians through the supplier of a new traffic control radio system. It is expected that the supplier (Motorola) will maintain this \$150,000 system under a maintenance contract agreement for several years with the two National Guard technicians to be trained in this period so they may assume ultimate maintenance responsibility when the contract expires.

The National Guard does not undertake maintenance of the radio network for the Department of National Investigation (DENI). This non-uniformed security group has its units repaired as required by the local Motorola representative. Likewise, a closed-circuit TV system utilized by the National Guard is maintained as necessary by the supplier of this equipment. The few radio

units used for maritime purposes by the National Guard are maintained in their central maintenance facility. However, radios used by the Panama Air Force are independently maintained by personnel other than regular National Guard technicians.

Specialized types of radio repair courses have been given to select technicians within the National Guard on several occasions by the USAID Public Safety Division and the U.S. Military Group at schools in the U.S.A. and the Panama Canal Zone. The preliminary knowledge gained through such training is of considerable benefit although the further development of technical skills is limited by poor supervision and organizational acceptance of mediocre work standards following a return to work by the technicians.

The National Guard tends to recognize some of these internal problems in developing an efficient maintenance section. They have a willingness to utilize their own funds, but look to competent outside guidance, when available, for advice on a means to improve their technical support capability.

In this area, an appropriate measure would be to offer the services of a Public Safety Telecommunications Advisor to work on a daily basis with local officials and technicians to gradually rectify the difficulties mentioned above. It is considered that the National Guard would accept and be appreciative of USAID interest to assist their organization in this necessary function. It is envisioned that major equipment and other related commodity requirements would be principally funded by the National Guard to support the improvements and other activities suggested by such an outside Telecommunications Advisor.

It is recommended that the USAID/Panama Mission consider and approve the assignment of a full-time Public Safety Telecommunications Advisor to assist the National Guard for a minimum three-year period.

IV. COMPATIBILITY OF INDUSTRIAL AND MILITARY GRADE COMMUNICATIONS EQUIPMENT

Both the USAID Public Safety Division and the U.S. Military Assistance Program render technical assistance, material resources and training to the National Guard. This type of assistance is functionally delineated according to whether a civil police or military-oriented requirement is to be satisfied.

One sector where much earlier assistance had been given was in the provision of radio communications equipment and associated items. All National Guard communication networks are primarily structured upon the use of commercial/industrial police-type equipment for administrative, city patrol, rural highway patrol, traffic coordination and long-range inter-province communications.

Military grade equipment such as the PRC-6, PRC-10 and PRC-77 types are also available and normally employed for short-range tactical field purposes where operations of a military nature may be occasionally conducted. The military VHF-FM (PRC-10, PRC-77 types) are low-powered, tuneable units which can communicate with nearly fixed frequency, high-powered, rural highway patrol cars if necessary, but this is not a normal procedure for the National Guard. Likewise, military HF-SSB radio sets are employed, which have the capability to tune to the same frequencies of the inter-province commercial HF-SSB radio sets. Nevertheless, each category of equipment is intended to function on its own assigned network frequencies to satisfy specific security or operational purposes without message interference.

The military grade of equipment is designed for rugged use under severe environmental conditions and is understandably more expensive to purchase than civil police radios. With the combined police and military posture of the National Guard, both types of equipment are successfully employed to satisfy civil or military type communication requirements.

The technical servicing of both types of equipment is accomplished in the same maintenance shop using basic commercial or military test instruments. National Guard technicians predominantly use commercial test instruments. Electronic spare parts for commercial units are usually available locally through the representatives of the equipment manufacturer. Special parts for military-type radios, unless they are stockpiled at the time the equipment is purchased, present some difficulties in timely and economical procurement from defense suppliers. An equivalent amount of specialized knowl-

edge is necessary for repairing either a military or industrial type radio once a basic familiarity is gained with such units.

V. RECOMMENDATIONS

- A. The National Guard Communications Division should promptly complete the physical construction of their proposed expanded location for their radio maintenance center and work to unify and coordinate the radio base and mobile/portable unit maintenance functions within this facility.
- B. The Chief of Radio Maintenance should develop and place into operation a simple but effective records system for inventory and control of spare parts, test equipment, tools and other material resources used by maintenance technicians.
- C. The Chief of the Maintenance Section should seek to structure a more efficient and disciplined overall radio shop organization to include a formal system of work assignments according to each technician's competence, a more rigorous attention and individual perseverance to the diagnosis and repair of more complex equipment malfunctions and a means for recognizing and rewarding those technicians who achieve or demonstrate an advanced level of measureable effectiveness in their technical tasks.
- D. As the National Guard continues to procure those radio and accessory items it deems necessary, both USAID Public Safety and the U.S. Military Assistance Group should coordinate their projected inputs of equipment and seek to correspondingly reduce those items where duplication or excessive amounts may exceed the absorptive levels of the organization. Technical liaison, formal training programs, distribution of training materials and other non-capital goods assistance shall continue on a regular basis, however, according to need.
- E. The USAID/Panama Public Safety Division should continue to make available, upon official request of the National Guard, the services of a TDY Telecommunications Advisor for short-term assistance as may be required for certain communication systems planning, equipment suitability and performance evaluation of items proposed for purchase by the National Guard as well as technical assistance in maintenance shop administration, records or technician training on specific problem areas.
- F. The assignment of a Public Safety Telecommunications Advisor is highly recommended for at least a minimum three-year period. This advisor would offer full-time technical assistance

to the National Guard Communications Division in those areas recommended above as well as undertake a more thorough and continuous effort to refine, modernize and strengthen the overall administrative, operational and technical support functions carried out by this key organizational element.

PANAMA NATIONAL GUARD
COMMUNICATIONS DIVISION
ORGANIZATION CHART
(As of Feb. 1973)

CHIEF
COMMUNICATIONS DIVISION

EXECUTIVE
OFFICER

SECRETARY

S-1/S-5

S-2/S-3

S-4

INTERNAL
OPERATIONS

TELEPHONE

POLICE
NETWORKS

INTERZONE
RADIO

INTERNATIONAL
& TELETYPE

CRYPTOGRAPHY

RADIO
MONITORING

CHIEF
MAINTENANCE SECTION

EQUIPMENT &
PARTS SUPPLY

FIXED FACILITY
MAINTENANCE CHIEF

SPECIAL TECHNICAL
ASSISTANCE GROUP

MOBILE & PORTABLE
MAINTENANCE CHIEF

TOWERS &
ANTENNAS

BASE
STATIONS

ELECTRICITY &
TELETYPE