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MANPOWER PLANNING HANDBOOK

Volume II: NavCommSta Electronics Maintenance Division

August 1975

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By:

Center for Naval Analyses
1401 Wilson Boulevard
Arlington, Virginia 22209
Operations Evaluation Group

Authors:

Bernard H. Rudwick, Michael E. Melich, Janice L. Kofman, Catherine E. Anderson

Controlling office:

Office of Naval Research
Department of the Navy
Washington, D.C. 20350

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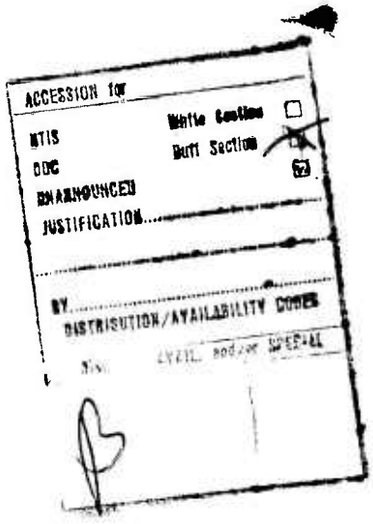
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Results of the electronics maintenance division manpower planning are presented. The work systematically relates manpower requirements at each Naval communications station to the communications services it provides.

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Encl: (1) CRC 286, "Manpower Planning Handbook, Volume II: NavCommSta Electronics Maintenance Division," Unclassified, October 1975

1. Enclosure (1) is forwarded as a matter of possible interest. It describes the planning logic and the 1975 planning factors needed to calculate billet requirements for an electronics maintenance division whose communications services have been specified.

2. Volume I of the Manpower Planning Handbook, dealing with analysis of the transmitter site, has already been distributed. Volumes III and IV dealing with the receiver site and the fleet center division, respectively, are in preparation. These volumes will be distributed in the near future.

3. Research Contributions are distributed for their potential value in other studies and analyses. They do not necessarily represent the opinion of the Department of the Navy.

4. Although enclosure (1) is unclassified, it is not approved for public release.

PHIL E. DePOY
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TABLE OF CONTENTS

TABLE OF CONTENTS (Cont'd)

INTRODUCTION

To relate manpower requirements to communications services provided by a Naval communications station, representative NavCommSta sites were asked a number of questions concerning their work during calendar year 1974 and the personnel used to do it:

- What jobs were done at the site within the scope of operations, maintenance, and support?
- How often were these jobs done?
- How many man-hours were needed to do each job?
- When a job was not done properly (that is, according to acceptability standards) because of a manpower shortage, how many man-hours would have been required to do so?
- How many people are now "on board," and how many were there during the past year?

Communications functions analyzed were: the transmitter site, the receiver site, the electronics maintenance division, and the fleet center division. These functions were the ones that would be most affected by the transition from high-frequency (HF) equipment to satellites. To reduce the amount of data obtained to some reasonable size, only the 4 automated NavCommStas participated in the project: Honolulu, Guam, Norfolk, and Italy. However, since Honolulu has 2 separate maintenance groups (Consolidated Maintenance and W-33), data from the 5 organizations was kept separate for the comparison.

The data obtained from the 5 sites was structured so that the number of man-hours required to do identical work could be compared and a consensus arrived at to perhaps serve as a reasonable manpower standard for this unit of work. By determining the units of each type of work associated with a particular site, the manpower units required could then be calculated. Such calculations are needed when:

- The annual manpower budget at each station is being prepared.
- Realignment options are prepared as the communications system is changed.

Based on the data gathered from the 5 participating electronics maintenance divisions, we were able to construct a 1975 ComNavTelComm Electronics Maintenance Division Planning Guide containing:

Planning Factors Data Base

- A set of all maintenance and support jobs and the manpower required during 1974.

- A set of Navy-approved work standards that can be compared with the set of of jobs and operating hours and used as a basis for establishing ComNavTelComm planning standards.

Planning Logic

- A method of calculating total man-hours required in these personnel categories:
  - Maintenance technicians.
  - Various support categories.
- A method of calculating billets required, based on the number of man-hours required, standard work-week characteristics, and various operational constraints.

The entire manpower planning process, including the standards recommended, has been reviewed and informally approved by Op-124.

To properly use the planning system, ComNavTelComm must now make these policy decisions:

- It and the sites should validate the planning factors data base and make certain that no required jobs are missing.
- Review the numerical values associated with the planning factors, particularly with the unit man-hour requirements at each site, among all 5 sites and against all Navy standards available. Then, for each work activity, decide on either one standard that will be applicable to all NavCommStas, or separate standards for each site based on factors unique to that site.
- Confirm in the planning process which jobs are to be included as part of the site's work load. There are many jobs that are not done at every site. For example, the NCS Public Works Department may service an outlying site; in other cases, the site may service itself. In the case of maintenance jobs, there is no common policy regarding which maintenance tasks are required. Consequently, certain sites do planned maintenance tasks beyond those in the Maintenance Requirements Card (MRC).
- Decide whether the difference in manpower observed among sites for doing a given job during 1974 resulted from some distinguishable difference, such as quality of manpower or environment, or from "statistical variations" and, therefore, some mean value can be assumed as a ComNavTelComm-wide standard.
- Validate the planning logic proposed. The results of this review will result in the required inputs to the planner regarding which planning factor values to use in his analyses.

STRUCTURE OF THIS HANDBOOK

The sequence of topics covered by this handbook is:

- Overview of the Planning System--describes the proposed manpower planning process in terms of the inputs the planner must provide and the various planning factors used to convert the inputs into billet requirements.

- Summary of Planning Factors Data Base--describes each planning factor generated.

- Planning Logic--contains the procedures for calculating the number of billets needed to maintain and support a given electronics maintenance division; this section also includes a set of work tables useful in systematically implementing the procedures.

- Appendix A--contains the details of the analysis and derivation of the planning factors; annex 1 to the appendix contains the sets of tables containing the actual data used and derived. (The data in the tables is also available on cards or 7-track magnetic tape for computer processing.)

OVERVIEW OF THE PLANNING SYSTEM

Figure 1 is a diagram of the manpower planning process as envisioned. Inputs to the process are the characteristics describing a specific system configuration at each site being analyzed. These characteristics include:

- Numbers and types of equipment maintained by the division.
- Maintenance policy to be implemented, including what types of noncorrective (planned) maintenance jobs are to be done and how often.
- The type and frequency of support jobs, such as cleaning and field days.

The system characteristics are then combined with planning factors (table 1) to give the man-hours needed for the various jobs. These man-hours are then converted to billets, using Navy standards for a work week.

BASIC ASSUMPTIONS

This section describes the various assumptions underlying the results.

The planning factors (table 1) were derived from 1974 operational data and are based on the best data available from each site as well as other sources. However, each site has been asked to upgrade its record keeping (primarily with respect to maintenance) and ensure it is recording the data requested. This way, more accurate information can be obtained in the future to revalidate the planning factors and upgrade their accuracy. But it is assumed here that the planning factors are valid and that an annual revalidation of the factors, based on 1975 work experience, will amend the data base as needed.

The planning factors derived in this report consist of localized factors; in other words, the manpower required to do the same job may differ from station to station. Unfortunately, the data collected does not show whether differences can be accounted for by factors such as environment, personnel quality in terms of training and experience, or age of equipment. These factors can be used when a specific NavCommSta (or one similar to it) is undergoing realignment.

From each set of five local factors, ComNavTelComm can generate one command-wide planning factor that relates to an "average environment," rather than a specific NCS. The ComNavTelComm factors can be used to ease calculations where environmental differences need not be taken into account. Since a number of different sites are being included in the realignment effort, individual deviations will tend to compensate for one another.

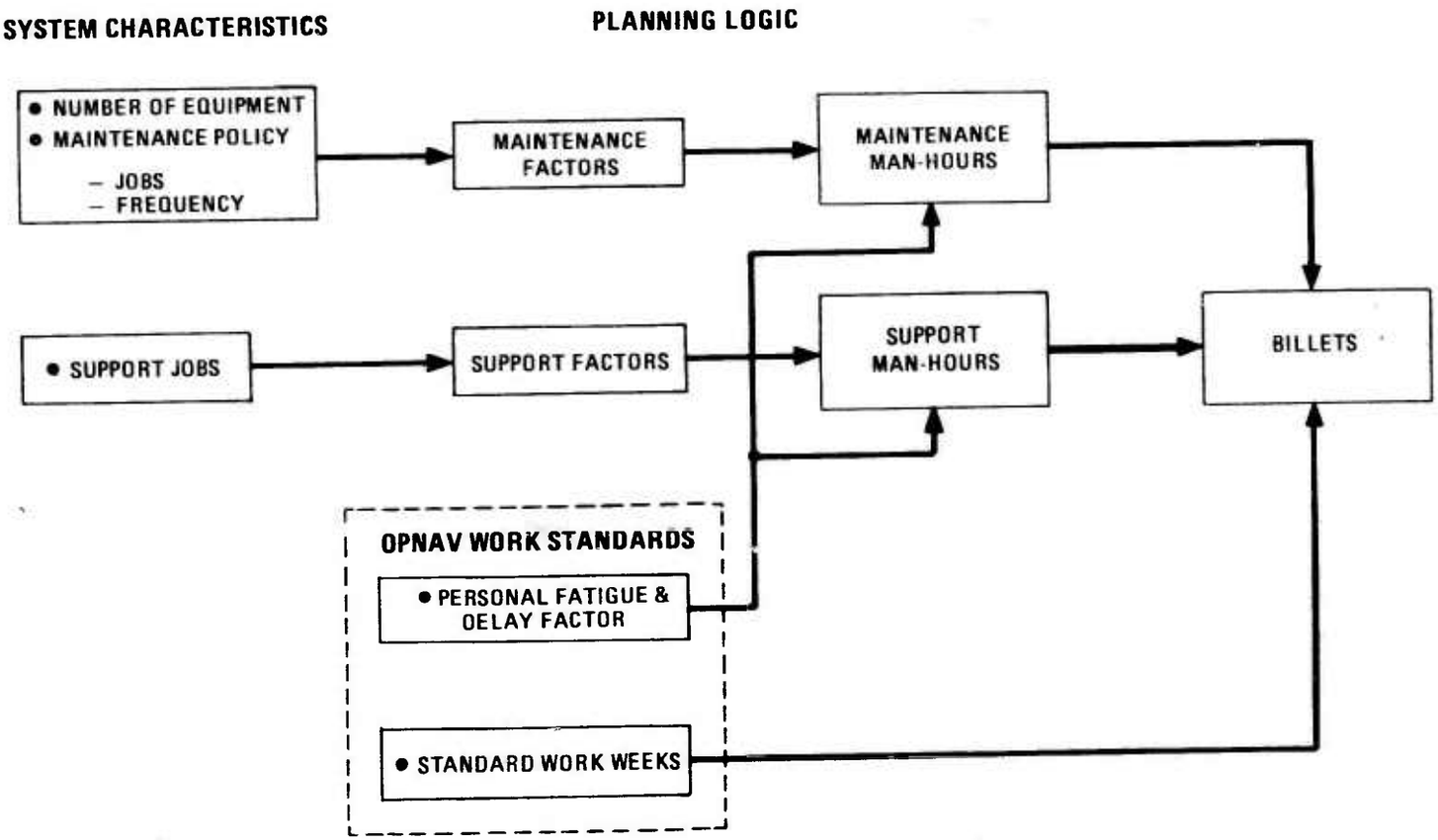

FIG. 1: MANPOWER PLANNING LOGIC

TABLE 1

ELECTRONICS MAINTENANCE DIVISION PLANNING FACTORS

Maintenance

1. Conventional operator planned maintenance subsystem (PMS) factors
2. Conventional technician PMS factors
3. Make-ready, put-away time factor
4. Other noncorrective maintenance (non-CM) factors
5. CM factors
6. Indirect maintenance activities factors

Support

7. Support primary duty factors
8. Support collatoral duty factors
9. Supervisory factors

OpNav work standards

10. Personal fatigue and delay (PF&D) factor
11. Standard work week

The objective of this analysis was to develop some rational basis for ComNavTelComm planning standards. Thus, when a Navy standard is greater than the actual work time needed, the standard is listed here as the requirement, recognizing that its use permits some slack in the system. Such a cushion may be used one of two ways:

- To do more than the minimum work--for instance, more equipment overhauls--at the discretion of the officer-in-charge.
- Not to man some billets depending on budget constraints.

USE OF PLANNING FACTORS

The context in which the planning factors are to be used can be summarized this way. The systems planner performs a set of preliminary analyses. He examines the need for communications services of various types, including geographical coverage, number of messages per unit time to be handled by each communications system (such as full-period termination vs. broadcast), division of responsibilities among NavCommStas, operating

loads to be accommodated for both peak operations and the entire year, and the division of these loads between satellite and HF equipment. Further system design considerations are then made, culminating in the configuration of alternative designs.

For each alternative being considered, this kind of information must be specified as inputs to the manpower planning system:

- The set of equipment to be in inventory at the station being considered.
- Total maintenance policy to be followed; that is, whether the prescribed PMS schedule is being followed for each unit of equipment, frequency of equipment overhaul, and the like.
- Specific operating procedures, as selected from the set of operational jobs listed in the data base.
- Operational use of the equipment.
- All support jobs required, as selected from the set of support jobs listed in the data base.

This volume considers only those input factors that affect maintenance and support work load.

The basic question is: For each system configuration being analyzed, how many billets of what type are required at each site for maintenance and support. The procedure followed is similar to the approach used by Op-124 and the Navy Manpower and Material Center (NavMMaC) in calculating billets required as a function of the average weekly work load at the site. Work loads that deviate from the average are accommodated this way:

- Using peak loaders for predictable peaks.
- Having the maintenance man do CM work before he does PM work.
- Bringing support personnel into maintenance activities if they can be trained to take on some of the simpler jobs during a peak.
- Working longer than the average standard shift or work week.

Overtime should be repaid with compensatory time off. This policy is implicitly included in calculating billets based on the total annual work load because peaks are included in that total. All other assumptions are noted in appendix A.

SUMMARY OF PLANNING FACTORS DATA BASE

This section describes the planning factors derived. The values of these factors and the method used in deriving them appear in appendix A.

MAINTENANCE MANPOWER REQUIREMENTS

These planning factors consist of the man-hours per year needed to do various kinds of maintenance for each type of equipment at each site. There are two types of maintenance manpower requirements:

- Site requirements--the number of maintenance man-hours that each site states it needs to achieve an acceptable performance level.
- Navy requirements--the number of maintenance man-hours that OpNav allows as acceptable for budgeting manpower.

Fortunately, all sites can do the work within the allowable Navy requirements.

PLANNING FACTORS

Specific planning factors have been generated for all the maintenance jobs.

Conventional PMS Factors

The allowable Navy requirement is to do the PMS actions specified on the Maintenance Requirement Cards (MRC) within the man-hours also specified on the cards. The man-hours do not include make-ready and put-away time or personal fatigue and delay. The PMS man-hours for each equipment type are given in table II-1.[1]

Make-Ready, Put-Away Factor (No. 3)

The allowable Navy requirement is 30 percent of the PMS time specified on the MRC cards.

Personal Fatigue and Delay Factor (No. 10)

The allowable Navy requirement is 17 percent of the PMS time.

[1] All tables cited in this section appear in annex 1 of appendix A.

Total Requirement for PMS

From the preceding considerations, the total allowable Navy requirement for each equipment unit is 1.47 times the PMS time. Table II-1 gives the site requirement for each equipment type. The total site requirement is considerably under the Navy requirement.

Conventional Operator PMS Factors (No. 1)

These make up that portion of the total conventional PMS actions performed by operators, rather than by technicians. These times are given in table II-1.

Conventional Technician PMS Factors (No. 2)

These make up that remaining portion of the total conventional PMS actions performed by technicians. These times are given in table II-1.

Other Non-CM Factors (No. 4)

These are the man-hours required to do all non-CM actions now being done at the various sites, but not listed on the MRC card. These jobs and the man-hours required are given in table II-2. Only W-33 at Honolulu and Guam indicated they did additional non-CM jobs .

CM Factors (No. 5)

The allowable Navy requirement is equal to the total conventional PMS man-hours allowed, or 1.47 times more than the times listed on the MRC cards. The CM requirement for each equipment at each site is listed in table II-1. The requirement for all sites is considerably under the Navy requirement.

Total Requirement for Maintenance

From the preceding considerations, the total allowable Navy requirement for each equipment unit is 2.94 times the PMS time. The requirement for all sites is under the Navy requirement.

Indirect Maintenance Activities Factors (No. 6)

On-the-job training and excessive travel from the site were the only other main jobs done requiring technicians; these times are listed in table IV-2. Only the off-line nonproductive portion of the on-the-job training man-hours should be used.

Support Primary-Duty Factors (No. 7)

These deal with the work done by nonsupervisory personnel whose primary duty is to support the division, as opposed to "hands-on" maintenance services. The billets required at each of the 4 sites for these services are shown in table IV-1[1].

Support Collateral Duty Factors (No. 8)

These are concerned with the work done by nonsupervisory personnel in addition to their other duties. The man-hours required for these services are shown in tables IV-2 and IV-3.

Supervisory Factors (No. 9)

The supervisory overhead rates associated with each overall site and its subordinate components is given in tables I-3 and IV-4.

OpNav Work Standards

Personal Fatigue and Delay Factor (No. 10 and 15)

This totals 17 percent of the working time applied to all jobs whose measurements consist only of productive work and do not include permissible breaks.

Standard Work Week (No. 11)

A standard work week of 40 hours and a "5-man-for-4-section"[2] watch is to be used. Taking into account service diversions, training, leave, and holidays, the hours available for work are 31.94 for military and 33.38 for civilian personnel.

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[1]For consistency among all 4 volumes of the Manpower Planning Handbook, operational data is contained in the table III-series and all support data is in the table IV-Series. No table III appears in this volume.

[2]Assigning 4 men for every watch position being manned continuously constitutes a 4-duty section watch. This results in a 42-hour work week (including meal time). Assigning a fifth man for each watch position allows for service diversions, training, leave, and holidays, and results in 33.6 hours per week available for work (including meal time).

PLANNING LOGIC

Procedures for calculating the number of billets needed to maintain and support the equipment for the alternative being proposed are outlined in this section. Data used in making the calculations can be entered in the manpower planning work tables; suggested formats for these tables appear at the end of the section (work tables 1 through 5).

MAINTENANCE MANPOWER REQUIREMENTS

Work Table 1

Equipment Needs

Decide on the numbers and types of equipment needed to be kept operationally ready for peak operations, such as major fleet exercises or contingencies. This information can be obtained from the users. The number includes spares. However, such needs should be confirmed by comparing the list of stated user needs with former usage under similar conditions. Such data is not now part of the planning data base; it should be collected as exercises are conducted. From this, determine which equipment is to maintained by division personnel. List the equipment type in column 1 and the total number required in column 2.

Planning Factors

Decide which set of planning factors is to be used for the realignment alternative under consideration: either the ComNavTelComm-wide planning factors, or the set of planning factors related to a particular geographical zone as represented by one of the 5 sites.

Equipment Inventory

Decide on the equipment inventory to be maintained at full readiness. Also decide what PMS schedule to follow, including all non-CM actions such as overhauls and appropriate work schedules.[1]

---

[1] According to current policy, all site equipment is to be fully maintained for both CM and PM. However, manpower may be saved (at the cost of more time to reach full operational readiness) when all equipment is not fully maintained all year, and greater use is made of strategic warning in starting the readiness process early enough. Further analysis of such a proposed policy change is required. If current policy were changed, the calculations of PMS and CM man-hours would be modified accordingly.

Technician PMS Man-Hours

Based on the PMS schedule to be followed, calculate the total technician PMS man-hours required for each equipment type. First, calculate the sum of the unit technician PM man-hours[1] needed for the total PMS schedule over the full year (from the list of all PMS jobs and their unit manpower requirements as included among the maintenance planning factors). List the unit technician PMS factors for personnel in column 3. The product of columns 2 and 3 gives the PMS man-hours required of technicians, and is listed in column 4. Find the total technician PMS man-hours (sum of column 4 entries). Any operator PMS man-hours required will be calculated in the analysis of the particular operating site concerned.

The total technician PMS man-hours required (column 4) should also include the appropriate "make ready and put-away" and PF&D factors. The OpNav requirement for these two factors are 30 and 17 percent, respectively. Thus, the OpNav requirement for technician PMS man-hours would be 1.47 times each of the totals shown in column 4. These totals should be listed as the last line of column 4.

CM Man-Hours

Calculate the CM man-hours required for each equipment type and list the total in column 6. This number consists of the product of the number of equipment units in inventory (column 2) and the CM planning factors listed in column 5. Find the total CM man-hours required (the sum of column 6 entries).

Calculating the OpNav CM requirement is a simpler process, since the CM requirement is defined to be equal to the total PMS requirement (including the additional 47 percent factor). Thus, the separate CM factors do not have to be listed in column 5, and the total of column 6 is equal to the total of the last line of column 4 plus the total of all operator PMS man-hours. (Our analysis shows that the latter is negligible.)

DIRECT SUPPORT LABOR

Work Tables 3 and 4

Support Needs

Decide which support jobs are needed at the division by reviewing the data base on support jobs, as well as the indirect maintenance activities of on-the-job training and excessive travel, and determining which of these the division has to do for itself, thus requiring division billets. In column 1 of work table 3, list the direct-labor support primary-duty functions (see appendix A) such as medical services, in which billets are to be provided by the NavCommSta rather than by outside organizations. The number of direct-labor

[1]Unit PM man-hours is the annual man-hours needed to do PM for one piece of this equipment.

support billets required for these functions is listed in column 2. The support primary-duty planning factors may be used in deciding how many billets should be allocated to these functions. List those support jobs being done as collateral duty in work table 4, along with the average number of work units done per week and the unit man-hours required for each work unit (columns 1, 2, and 3). Calculate the total man-hours per year required for each job and list this total in column 4.

Support Man-Hours

Determine who will do each job in terms of these categories:

- On watch.
- On day shift.
- Primary-duty support personnel.
- Supervisors.

Allocate the total support man-hours required among these billet categories and list in columns 5, 6, 7, and 8 of work table 4. While using maintenance personnel for this purpose may not seem efficient, it does offer the advantage of having extra maintenance workers available for peak operations. Add the total man-hours required for each category.

TOTAL BILLET REQUIREMENTS

Work Table 5

The remainder of this section explains how to calculate billet requirements for each class of personnel. The characteristic being calculated is given in the rows of column 1 of work table 5. The data for each calculation should be listed in column 2.

Direct-Labor Maintenance Personnel

Determine the total number of direct-labor maintenance personnel required by following the characteristics listed in column 1, entering the data requested in column 2.

First, enter the PM and CM work loads to be done by technicians (either on watch or day shift) in rows 1 and 2. Enter the total in row 3. In calculating the total maintenance man-hours, the CM planning factors have nonproductive time built in, whereas the PM planning factors do not. Hence, only the latter time must consider the PF&D factor as well as make-ready, put-away factor; these were included in work table 1.

The next step is to calculate the total number of maintenance billets required (row 5 of the table). There are three major factors to consider in this determination:

- Average maintenance work load.
- Peak work load the system is designed for, and how flexible the system is in sharing maintenance work load with other personnel (such as maintenance supervisors).
- Constraints, such as safety.

Each factor is considered in greater detail here. The number of maintenance billets, B_m, based on average work load is determined first:

$$B_m = TMW/52\,(TAW),$$

where B_m = direct labor maintenance billets required (row 5);

TMW = total maintenance work load to be performed by maintenance personnel (row 3);

and TAW = time available for work per week.

According to the standard work week of 40 hours (where dependents are authorized), TAW equals 31.94 hours per week for military and 33.98 hours per week for civilian personnel (reference 1). An assumption here is that a watchstander assigned to a 5-man-for-4-section watch also has about 32 hours per week available for work because of time out for meals.

TAW thus is based on a weighted average of these two factors and depends only on the civilian-to-military ratio at the site. For example, if there were 10 civilian to 40 military direct labor personnel at a site, TAW, the weighted average, would be:

$$TAW = \frac{10}{50}(33.98) + \frac{40}{50}(31.94) = 32.35 \text{ hours per week.}$$

Enter this weighted average of TAW in row 4. Enter the results of the calculation of B_m in row 5, column 2. Carry the billet calculations to the nearest 100th of a billet until all calculations are completed and a final "round off" of fractional billets is made.

Allocate the maintenance direct labor among the four watches (row 6) and day shift (row 7), and see that anticipated peak loads during the week are accommodated. Note that watches do not have to be manned equally, and peak loaders can be used.

Next, determine the additional billets required to do the support collateral duty work load the same way the maintenance billets were calculated. First, the support collateral duty work load done by watch personnel should be listed in row 8 and that done by day shift

personnel in row 9. Second, determine the additional number of watch billets and day shift billets required by these work loads, using the same formula as for determining maintenance billets; list these watch billets in row 10 and the day billets in row 11. Calculate the total maintenance watch billets as the sum of rows 6 and 10, inserting this in row 12, and the total maintenance day shift billets as the sum of rows 9 and 11, inserting this in row 13.

Check to see that the safety constraint is satisfied (minimum of 2 men per watch at a given location). When either of these factors is a problem, it can be alleviated by adding maintenance technicians to the watch or not manning a watch.

Maintenance Supervisors

Determine the number of maintenance supervisors required:

$$B_{ms} = B_m S_{rm},$$

where

B_{ms} = number of maintenance supervisor billets on watch (row 15) and for the day shift (row 17)

B_m = number of maintenance billets on watch (row 12) and on day shift (row 13);

and

S_{rm} = maintenance supervisor overhead ratio for the watch (row 14) or for day shift (row 16).

Support Primary-Duty Supervisors

Determine the number of support primary-duty supervisors required:

$$B_{ss} = B_{sp} S_{rs},$$

where B_{ss} = support primary duty supervisors (row 20);

B_{sp} = support primary duty billets, (row 18);

and S_{rs} = support primary duty supervisor overhead ratio (row 19).

The service diversion work load should be examined as part of the entire service diversion requirement to ensure that the total does not exceed an average of 8 hours per week. When it does an appropriate number of additional billets may be added.

Fractional Manning

After the number of billets for each function has been calculated to the nearest 100th of a billet, fractional manning problems may arise. In the past, this was solved by arbitrarily selecting the equivalent of one-half (0.5) as the cutoff point. Any work load that earned at least one-half space was awarded the next whole number without regard to work center size. Those that earned less than one-half did not get the extra manpower (reference 2).

Overload factors are established based on the premise that separate criteria should be applied to small and large work centers. A maximum individual work overload is established at 1/2 hour per working day, and is cumulative until reaching a maximum of 1/2 billet. The cutoff point is the highest value the fractional manpower can equate to before the manpower requirement is rounded to the next higher integer. Table 2 reflects fractional manpower cutoff points for both military and civilian manpower.

Qualitative Requirements

Next, determine the qualitative requirements of each position in terms of designator, grade, rate, and series. This should be done uniformly, based on the total number of people required in each functional unit.

TABLE 2

FRACTIONAL MANPOWER CUTOFFS FOR COMPUTING STANDARDS

Manpower authorized		Fractional manpower cutoff	
		Military	Civilian
1		1.081	1.078
2		2.162	2.155
3		3.243	3.233
4		4.324	4.310
5		5.405	5.388
6		6.486	6.466
7		7.500	7.500
Over 7	Authorized manpower	+0.500	0.500

WORK TABLE 1

MAINTENANCE MAN-HOUR REQUIREMENTS

(1)	(2)	(3)	(4)	(5)	(6)
Equipment required		Technician PMS factors	Technician PMS man-hours	CM factors	CM man-hours
Type	Number				

WORK TABLE 3

SUPPORT PRIMARY DUTY REQUIREMENTS

(1)	(2)
Support primary duty functions required	Billets required

WORK TABLE 4

MAN-HOUR REQUIREMENTS FOR ADDITIONAL JOBS

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Job Description	Average work units per week	Support planning factor	Total man-hours per year	Watch allocation	Day shift allocation	Primary duty support allocation	Supervisor allocation

WORK TABLE 5

CALCULATION TOTAL BILLET REQUIREMENTS

(1) Characteristic being analyzed	(2) Total man-hours required
1. Total maintenance technician PM work load	
2. Total maintenance technician CM work load	
3. Total maintenance technician work load	
4. Standard work week (for labor mix)	
5. Number of maintenance billets required	
6. Number of maintenance billets on watch	
7. Number of maintenance billets of day shift	
8. Support collateral duty work load done by watch personnel	
9. Support collateral duty work load done by day shift personnel	
10. Additional number of watch billets required	
11. Additional number of day shift billets required	
12. Total number of maintenance watch billets required	
13. Total number of maintenance day shift billets required	
14. Watch supervisory overhead ratio	
15. Number maintenance watch supervisors required	
16. Day maintenance supervisory overhead ratio	
17. Number maintenance day supervisors required	
18. Number support primary duty billets	
19. Support supervisory overhead ratio	
20. Number support primary duty supervisors required	

REFERENCES

1. OpNav 12P-6, "Manpower Requirements Program," Unclassified, 29 May 1974
2. OpNav 12P-8, "Manpower Requirements Program," Chapter IV, Unclassified, 23 Jan 1973

APPENDIX A

ANALYSIS AND DERIVATION OF PLANNING FACTORS

APPENDIX A

ANALYSIS AND DERIVATION OF PLANNING FACTORS

This appendix describes the planning factors and how they were derived for the maintenance and support functions analyzed. Data as submitted by each site has been forwarded separately to ComNavTelComm. As table 1 of the main text shows, 11 basic planning factors have been derived for those functions. Each factor is described here, indicating:

- Numerical values of the recommended planning factors.
- How the original data submitted by the 4 sites was converted into planning factors.
- Existence of Navy work standards and their use in this analysis.
- Organization of the planning factors data base so that the planner, following the planning logic described in the main section, can retrieve desired values from the data base.
- Other planning information derived during the analysis.

PERSONNEL INFORMATION

The main objective of this analysis was to determine the appropriate supervisory "overhead" factor now associated with each work function. However, one by-product was a list of all billet titles for all personnel at each site. A comparison of each station's billet titles with a master list that was generated, and each station's title preferences are given. This structure was generated to aid Code-01 in formulating a final, preferred set of standard billet titles.

Uniform Billet Titles

Table I-1 of annex 1 is a composite of all billets filled as of the survey date and as submitted by each of the sites. Column 1 is a master list of practically all billets commonly associated with electronics maintenance divisions. These billets are grouped into branches.

The billets reported at Honolulu, Guam, Norfolk, and Italy were then matched against this list, as shown in columns 2, 3, 4, 5, and 6, respectively. As in the original data, the word "same" in place of a billet title indicates that the site uses the master position title; another title indicates the title now used there. When the site indicated a preference between the master billet title and the one it uses, the title is starred.

Billets that do not correspond to the master list are also listed in the division in which they exist, with the same letter designation used in that site's original data. Note that billet A at one site need not be the same as billet A at another site, since the original data forms were completed independently with only the master billet listed as a guide. Lettered billets from different sites apparently relating to one another, yet have different billet titles, are clustered near each other.

Although all billets in the master list appear in column 1, there are billets that do not exist at any of the 4 sites.

Table I-1 was created to help in developing a set of uniform billet titles. Titles now in use can be compared with this list and a decision made by the command concerning the preferred set of billet titles.

Manning Distribution

Table I-2 gives total manning used for maintenance, support, and general management (that is, the supervisors in the management office) at the sites. The number of direct labor, functional support, and supervisory personnel are also indicated within each division, as is the military-civilian composition of each category.

Table I-3 also shows the manning distribution of labor between day workers and watchstanders. The purpose of tables I-2 and I-3 is to compare distributions of the personnel among sites, as well as provide a basis for deriving supervisory overhead rates (described under support manpower requirements).

For Guam, supervisory status information was given for only 26 of 95 manned positions. Thus, as table I-3 shows, the actual data provided was extrapolated to the 95 positions using this logic:

- No other general management positions exist, other than the 4 listed.
- The proportions of maintenance, direct labor, functional support, and supervisors that exist in the remaining 22 positions are the same as for the 69 positions on which data is lacking.

MAINTENANCE MANPOWER REQUIREMENTS

To minimize differences among the sites in the number of man-hours each spent in its PMS and CM functions for one unit of equipment, 3 classes of maintenance work were defined.

Conventional PMS Work

This first work category is defined as the annual man-hours required to perform the minimum PMS actions specified on the MRC card for one unit of equipment, but does not include any extra non-CM work the site does because it feels it is necessary. The conventional PMS man-hours are defined to include all maintenance man-hours, including the man-hours required for "make-ready and put-away" and all breaks taken. Any excessive travel time to other sites has been separated from work times and is included in tables IV-3 and IV-4.

Since the operator may do part of the PMS actions, it is necessary to know his share so that a division of the total PMS time can be made between operator and maintenance technician.

Other Non-CM Work

There were several nonrecurring maintenance activities that were done at Honolulu but were not at all sites. To identify these differences and still allow the planner the choice of including those work functions he desires in his analysis, we have structured all of this nonstandard, non-CM maintenance work and the man-hours each required as additional jobs. But to obtain official billet credit for such work as part of the PMS system, ComNavTelComm will have to make such recommendations and submit them to NavMat for approval.

CM Work

This category is the annual man-hours required to perform all CM actions, including replacement of parts during PMS.

Data Organization

Tables II-1 and II-2 deal with the maintenance planning factors and are derived from the data submitted by the 4 sites.

Table II-1 gives numbers and types of all equipment being maintained at the 5 locations. This equipment is listed alphabetically and described in column 2 and numbered sequentially in column 1. As a cross-reference to locate the data in that table, the maintenance numbers as originally given by each site are listed in column 3.

Column 4 gives the number of units of equipment of each type at the sites. When the number maintained is different from the total number on hand, this is also indicated, and the latter figure is the one used in all calculations to determine unit times.

The total man-hours per year needed for both CM and conventional PMS maintenance (not including extra jobs) for one unit of each piece of equipment is given in column 5. In all cases these times include time for breaks and make-ready, put-away, but does not

include excessive travel time to other sites. This time is accounted for separately as part of planning factor 6.

Columns 6, 7, and 8 list man-hours needed for different aspects of conventional planned maintenance, as specified on MRC cards. Column 6 gives the standard times reported by the sites for planned maintenance by operator personnel on one unit of equipment (planning factor 1). Only Honolulu W-33 reported any of these times. Furthermore, it is assumed that this task is being done by operators at some site and is thus factored in by that site. Column 7 gives the equivalent standard times by maintenance technician personnel (planning factor 2). Column 8 gives the total of these two times, which is the annual man-hours required to perform minimum PMS on one unit of equipment. Locally generated standards are also reported; in those cases, the standard is followed by (L). These times do not include extra non-CM work, which is covered in table II-2.

Column 8 also gives the official MRC standards as obtained from NavTelComm Code-04 Readiness Department. In some cases, the standard differs with different models of the same equipment; the range of values separated by a slash is given for those instances.

Column 9 gives the annual man-hours the sites reported as necessary for conventional planned maintenance on one unit of equipment (not including the time required to do the extra jobs listed in table II-2). These times usually were very close to the PMS standards. This was expected, since all sites indicated they did not keep records of PM work times; instead, they based their PM requirements on the PMS standards.

Another source of maintenance manpower standards was also examined -- the maintenance standards used by the Navy Security Group. These maintenance standards are important to this project because:

- The Navy Security Group has many kinds of equipment common to NavCommSta equipment at other sites being analyzed.

- The logic used to derive maintenance requirements correlates closely with the logic proposed in this analysis.

- The Navy Security Group's maintenance needs compare favorably with the U.S. Army and Air Force maintenance records for the same equipment; these have been officially approved as the Service Cryptologic Agencies (SCA) standard by the Director of Defense Research and Engineering (DDR&E).

The SCA standards for the two types of equipment also appear in column 5. The logic used in deriving this standard is described elsewhere in this analysis.

Column 10 is used to display the corrective maintenance planning factors (number 5). This is the average man-hours per year for one unit of equipment that the sites reported as required to do all corrective maintenance, including parts replacement during PM.

Table II-2 is a list of non-CM jobs done by Honolulu W-33 and Guam and above those listed on the MRC cards. W-33 jobs involve a one-time expenditure for low-level conversion of the equipment listed. These are tasks done during 1974 and are not expected to be repeated on that equipment. However, the nonrecurring jobs indicate how much time may be spent on other jobs, and ComNavTelComm may wish to program additional man-hours.

ANALYSIS OF MAINTENANCE DATA

This section contains the analytical results obtained by correlating all the maintenance data collected during this project. These results also can be applied to other NavCommSta maintenance areas.

Basically, the analysis consisted of two types of data comparisons. First, the man-hours reported required by each site to do a work element were compared. Second, official Navy standards (approved by Op-124) were also identified, and these were compared with the requirements stated by each site. Table II-3 shows the results of this comparison.

First, consider the intersite comparison. The analysis consisted of calculating a number of ratios using the PMS standard as the uniform basis of comparison, thus eliminating differences in the numbers and mix of equipment among stations.

- Line 1 shows the sum of PMS standard man-hours for all equipment at each site. The PMS standards used were the times for PMS actions performed by the technicians only, since these were the times provided by 3 of the 4 sites. The operator PMS times provided by Honolulu W-33 amounted to only an additional 1.2 percent of technician times.

- Line 2 shows the total man-hours required by each site to do all PM jobs, both the conventional PMS and all extra non-CM jobs. It also includes time for "make-ready and put-away" and "work breaks" in its PMS requirements; it does not include excessive travel time, which is dealt with elsewhere in this handbook. All 4 sites indicated they took work samples as the basis for their estimates.

- Line 3 shows the man-hours used for the extra non-CM jobs done at each site.

- Line 4 shows the man-hours used to do the conventional PM jobs.

- Line 5 shows the total man-hours required for CM.

- Line 6a shows the ratios of total requirements for PM and CM as reported by each site (including all extra non-CM jobs) to the PMS standard. This was the most important result.

These ratios were then compared with Navy maintenance standards approved by Op-124. While these standards were constructed for communications equipment used by the fleet, they are the best data available to Op-124. The standards were obtained this way:

- The PMS standard listed on the MRC card is the official requirement for PM actions. But the PMS standard is for working time only; an additional 17 percent is allowed for PF&D (planning factor 10).

- The PMS standard does not include make-ready and put-away time, which is allowed as an additional factor (number 3); no official time has been set by the Navy. The exact amount of time is a function of the distance between where the tools and parts are kept and where the equipment is located, and how many times the same tools are used in maintenance at that location. Op-124 permits a factor of 30 percent for the fleet and has indicated it will also permit a 30-percent factor for shore stations until a thorough study can be conducted.

Thus, the total Navy PM requirement for work specified on the MRC card is 1.47 times the PMS standard.

While there is no Navy CM standard similar to the PMS standard, there is an OpNav policy used for fleet manning purposes -- paragraph 106.1.c(6) of reference A-2. This policy states that for every hour of CM action, one hour of PM action is needed for electronic equipment. Op-124 further interprets this policy for determining billet requirements by estimating CM man-hours required for the fleet as being equal to the total PMS man-hours required. Again, it will permit this factor to be used as the Navy requirement for shore stations until a more thorough study can be made. The CM-to-PM man-hour ratio was therefore calculated for each station, using the PMS standard man-hours as a reference. An appropriate CM:PM ratio thus can be used as a standard for each site or for the entire command.

The total maintenance requirement for fleet operations is therefore 2.94 PMS time. Additional man-hours for extra mon-CM maintenance appear on MRC cards when officially approved by NavMat.

The maintenance standard used by the SCA was found to be 3 times the PMS man-hours, reasonably close to the Op-124 standard.

With the preceding discussion in mind, we next compared each of the site's total maintenance requirements ratio (line 6 of table II-3) with the derived Navy requirement, whose ratio is 2.94. All sites are well within the Navy requirement.

While the intent is to use the PMS standard as the basis for allocating billets, the NavCommStas themselves differed in their numerical values of the same PMS standard, as shown in table II-1. In some cases, the value given is even lower than the official standard. When a set of numbers differs considerably, ComNavTelComm should determine why and assign a correct value for each site.

The reasons for the differences include:

- Differences in the amount of work being done, particularly in "as-required" work.
- Differences in PMS standards for different models of the same equipment; column 8 of table II-1 shows the range of values of the standard for different models.
- Arithmetic errors by the site in calculating the standards.

One additional analysis was done at this level of detail. According to ComSecGru its analysis (not yet approved by the SCA) shows that teletype maintenance requires fewer man-hours than does electronics maintenance; this maintenance factor will be reduced to less than 3 times the PMS standard. A calculation of ratios of total requirements for teletype and other equipment is made in rows 6b and 6c. Only Guam shows any significant difference. Therefore, row 6a should be considered as the site planning factor.

Because of the differences in ratios among the sites, several other analyses were also made at the next level of detail. The first was a calculation of the man-hours required to do both the PMS jobs and the extra, non-CM jobs now being done (and listed in table II-2). This comparison among sites of the extra man-hours required is best shown by taking the ratio of the total PM man-hours required to the man-hours associated with the PMS standard. These ratios (row 7 of table II-3) show that all sites deviate only slightly from the PMS standard. Even counting the extra jobs done by Honolulu, Rows 8 and 9 confirm that the extra jobs require no additional manpower for 4 locations (6 percent extra for Honolulu W33). While Guam's footnotes indicate that it requires a make-ready, put-away factor of about 15 percent for Building 112 and 35 percent for down-island spaces, its PMS requirements do not reflect this. Thus, it is assumed that these extra man-hours were included in excessive travel time (planning factor 6).

A second analysis was concerned with finding the ratio of CM man-hours to the Navy man-hours allowance for PM and comparing this ratio with the Navy requirement (unity). This is shown in row 10 of table II-3. Norfolk and Italy are much higher than the other sites in this respect. Row 11 of table II-3 provides a similar ratio of CM required to the PMS standard, rather than to the Navy PM required.

The results show that all sites fall within the Navy requirement.

INDIRECT MAINTENANCE ACTIVITIES FACTORS

The man-hours required to perform other activities associated with maintenance were also gathered. These make up the additional planning factor (number 6) unique to each station. These activities include:

- On-the-job training for maintenance.

- Excessive travel to remote sites serviced by maintenance personnel.

These activities are listed under maintenance rather than support, since they can be done only by maintenance technicians. That is, a maintenance technician is needed to drive the track to a remote site if he is the one who must also repair the equipment at the remote site. But a technician would not be needed for travel involving only pick-up or delivery.

While these activities are related to maintenance, their descriptions and times required are included in table IV-2 under support collateral duty jobs, since the data follows the same format. In the case of excessive travel, this data includes the number of trips to remote sites during 1974, as well as the round trip mileage and times involved.

A lot of on-the-job training time for maintenance results in completion of part of the maintenance workload. Thus, if on-the-job training time were added to the maintenance workload requirements, "double counting" of the same workload would result. Therefore, we must estimate the amount of on-the-job training man-hours that is equivalent to productive maintenance workload and not count these man-hours in on-the-job training requirements. The expression "equivalent to" productive maintenance workload is used, since the trainee may take more man-hours than the average trained person to do the same job.

To illustrate this point, consider the on-the-job training needs at Italy's transmitter site. New radio men and electronic technicians are trained on off-the-air circuits for 60 man-hours per year. Each man is also assigned for 176 man-hours to on-the-air circuits. However, this productive work is done at a lower efficiency than would be the case with trained personnel (assume 70 percent efficiency). Thus, $[60 + (0.30)(176)]/(60 + 176)$ or 48 percent of this part of the on-the-job training was nonproductive and should be counted.

Also, according to Op-124, on-the-job training requirements must be based on raising the capabilities of those unqualified for the job -- for example, training for specific equipment. The requirements cannot be based on assigning persons with lower grades or incorrect Naval Enlisted Codes.

SUPPORT MANPOWER REQUIREMENTS

Three types of support work loads are identified:

- Support primary duty workload -- that work done by nonsupervisory personnel whose primary duty is to support the site, as opposed to "hands on" operations and maintenance services.

- Support collateral duty work load -- that work done by nonsupervisory personnel in addition to their primary duties.

- Supervisory work load -- that work done by non-direct labor supervisor.

Support Primary Duty Factors

Table IV-1 is a list of all support primary duty billets filled at the 5 sites and constitutes planning factor 7. Column 1 gives the position titles (of support billets only) from the master billet list, and columns 2 through 5 show the titles that are in use for filled billets at all the sites. If the site uses the same title as shown in column 1, "same" is indicated. Support billets that do not correspond to a billet from the master list are preceded by the letter used to identify the position submitted by that site.

After each site's billet title is the number of persons now in that billet if that number is more than one. Also indicated is the percentage of time, if less than 100 percent, that the person is involved in direct labor. Part of this direct labor time may be spent in collateral duty support jobs (see the next section).

No work analysis was made of these support primary duty jobs. However, to systematically assign these support billets, the command must analyze table IV-1 and determine:

- Whether the work function is required at each site that has the billet listed. It must also be confirmed that the support activity cannot be done by the station's public works department or other Navy support activities because of the site's distance from a regular Navy base. (Appendix B of reference A-3 contains the set of tasks relating to the master billets listed.)

- How many full-time equivalent workers are required for this work function at each site. This depends on the size and layout of each site and whether the function is (or can be) provided to any extent by the main station or by other Navy support services (such as regional medical services).

This way, judgment has to be used in allocating these billets.

Support Collateral Duty Factors

Table IV-2 is a composite of support collateral duty jobs now being done at the 4 sites and constitutes planning factor 8. Column 1 briefly describes the type of job involved, such as cleaning. This is followed by a list of support jobs, by number, as a cross reference to the data submitted by each site, and the total man-hours per year required to do each job clustered in that job category. A more detailed description of those collateral support jobs appears in table IV-3, including the method for calculating support.

Columns 1, 2, and 3 of the table describe the job and the work unit measure. Column 4 is the hours needed by one man to complete one work unit. Column 5 is the number of work units done per week by all the men involved; it is thus the product of the number of times each man does a work unit per week and the number of men doing them simultaneously. Column 6 is the total man-hours per year required for the job, and consists of 52 times columns 4 and 5.

In some cases, only the total man-hours (column 6) was given by the site (column 4 and 5 were missing). In other cases, the product of 52 times columns 4 and 5 does not correspond to column 6. This is indicated by a question mark in the margin. It is important that, during its review of this report, each site make the necessary additions and corrections to its data so that ComNavTelComm can review these lists and decide:

- Which collateral jobs must be done, and how often.
- Which are really part of service diversions or off-hours activities and not counted as productive work.
- How many man-hours are needed for each job. Op-124 stresses that requirements can include only working time; for "on-call" duty, only actual working time can be counted.
- Who should do the work -- operational or maintenance (or both) personnel, primary duty personnel, or outside personnel.

As described elsewhere in this handbook, requirements for collateral support stated by the sites absorb a substantial part of the division's total direct labor. Further analysis and validation of these requirements by the command is therefore very important.

Supervisory Factors

Another support planning factor is the supervisory overhead rate (planning factor 9), which is the total number of full-time equivalent supervisors divided by the full-time equivalent nonsupervisory (now on board) personnel in the organizational unit being analyzed.

This calculation was made for each of these organizational components:

- Total site overhead.
- General management (percent of total direct labor).
- Watch maintenance (percent of total direct labor personnel on watch).
- Total maintenance division (total watch and day maintenance personnel).

The data shown in table I-3 is organized into the above components and arranged into total full-time equivalent direct labor and supervisors and the calculated supervisory overhead factors within these components. The results of these calculations (using the extrapolated data for Guam and Italy) were taken out of table I-3 and summarized in table IV-5. The most important set of numbers is the overall site supervisory overhead ratio, which varies from 13 to 33 percent. There is no Navy requirement for this ratio.

Further analysis of table IV-5 shows that there are significant differences in component overhead rates, both among and within sites; some of these rates at Guam, Norfolk, and Italy seem quite high. Further discussions at transmitter and receiver sites regarding the division of work between the supervisor and workers revealed that:

- The supervisor works side by side with the workers doing a portion of the operating work load previously described, particularly during busy hours.

- The only operating work load not listed, and which is done by the supervisor, consists of on-the-job training, spot-checking the quality of work of his personnel; availability as the senior person for any problems that arise during the watch; and evaluating personnel.

- While the supervisor has overall responsibility for proper operations during the watch, he delegates this responsibility among all watch personnel. Thus, the only man-hours this ultimate responsibility really costs is in performing the tasks described in the preceding item.

Since the overhead ratios calculated in table IV-5 were obtained from estimates based on job titles and not on a work function analysis, their accuracy is doubtful. Experience indicates that the overhead ratios are probably smaller than those shown in the table. A satisfactory estimate of the supervisory overhead planning factor may be obtained in one of these ways:

- For supervisors who do not perform direct labor, determine their work functions to substantiate the need for a full-time position with respect to the size of site and the number of direct-labor personnel. For example, large sites might require an assistant officer in charge; small sites might only require a chief in charge.

- For working supervisors, estimate the amount of supervisory tasks not already being counted under direct labor (or listed among the support jobs), and estimate the time required to do these. Recalculate the supervisory overhead rates as before. Excluding the planning function, the overhead ratio probably should be 5 to 15 percent.

OP-124 WORK STANDARDS

Work standards provided by Op-124 as planning factors are described in this section.

Personal Fatigue and Delay (PF&D) Factor (Planning Factor 10)

Op-124 allows a PF&D factor of 17 percent of productive work time for blue-collar workers for all work stoppages, including personal relief. When deriving the total man-hours it is therefore necessary to determine whether the measure consisted of only productive work time (such as would be obtained through work samples), or whether the time also included various work stoppages -- such as coffee breaks -- as in the corrective maintenance times recorded.

Standard Work Week (Planning Factor 11)

Standard Work Week for Military Personnel Ashore

The standard work week (reference 1 of the main text) for military personnel at CONUS activities and overseas bases where dependents are authorized is 40 hours. Included in this work week is an allowance for service diversions; this allowance provides for quarters, sick call, personal business, etc. The 40-hour standard work week for military consists of:

	Hours per week
Service diversion training	4.83
Leave	1.85
Holidays	1.38
Time available for work	31.94
Total	40.00

The standard work week for military ashore at CONUS activities and overseas where dependents are not authorized should be computed this way:

	Time available for work	Nonavailable hours	Total
Continuous shift watchstander	60.0	6.0	66.0
Duty status watchstander	61.7	6.0	67.7
Nonwatchstander	51.0	6.0	57.0

The work week for military firefighters and other watchstanding personnel using the 72-hour work week is:

	Hours per week
Service diversions training	4.83
Leave	5.07
Available for work	62.10
Total	72.00

Standard Work Week for Civilians

The standard work week for civilians is 40 hours. Training includes classroom lectures, on-the-job instructions, and safety indoctrination. Diversions include minor unavoidable delays such as fire drills, chest x-rays, voting, blood donations, etc. The 40-hour standard work week for civilians consists of:

	Hours per week
Leave	4.60
Holidays	1.38
Training	0.22
Diversions	0.44
Time available for work	33.38
Total	40.00

The standard work week for civilian supervisory firefighters using the 56-hour work week is:

	Hours per week
Leave	6.37
Training	0.20
Diversions	0.44
Available for work	48.99
Total	56.00

The standard work week for civilian firefighters using the 72-hour work week is:

	Hours per week
Leave	8.21
Training	0.20
Diversions	0.44
Available for work	63.15
Total	72.00

MANPOWER REQUIREMENTS AND UTILIZATION ANALYSIS OF O&M PERSONNEL

The main objectives of this analysis were to:

- Compile relative manpower requirements for each work category performed by maintenance personnel. This would be useful in sensitivity analyses, since the impact of any approximation on total error could be more readily evaluated.

- Provide a first calculation of the billets required based on the work loads and make a first step in comparing these billets with personnel on board.

- Perform a "check and balance" on some of the data provided by the sites.

Man-Hours Required

Table V-1 gives the man-hours required for each job as defined. This calculation was made two ways: in terms of the stated site requirements (lower bound) and the Navy requirement (upper bound).

For example, in terms of the Navy requirement, the Honolulu workload requirements are in these proportions (as percentages, rounded off):

Maintenance by technicians	:	
CM	:	30
PM	:	30
		60
Collateral duty support	:	40

Billets Required and Utilization

The next set of calculations involved converting the man-hours required in each category into direct-labor billets; this was done by dividing by 1,661 man-hours productive time per billet per year. (This is for military personnel only. A more accurate calculation would consider the military-to-civilian mix. This approach does not include any limitations, such as having a minimum of 2 men per watch section.) This was then compared with the total number of direct-labor personnel now on board in each work category. A personnel utilization calculation was made next by taking the ratio of billets required to current manning. These results (see table V-2) indicate the average proportion of time that current manning would spend working in these categories:

- Maintenance direct labor personnel doing CM and technician PM.
- Total direct-labor personnel doing collateral duty support.
- Total direct-labor personnel doing all required work.

As discussed elsewhere in this handbook, some of the supervisory percentages seem too high. Therefore, a recalculation of personnel utilization was made in tables V-1, and V-2, based on total current manning in each category, including both direct-labor and supervisory personnel. While this total unit utilization is less than the first case (since total personnel is the denominator of the ratio), it is probably a more realistic number than the one obtained from the first calculation. Also, this number can be extrapolated to the direct-labor force by subtracting perhaps 10 percent for supervision.

REFERENCES

A-1. Navy Manpower Shore Survey Team, Norfolk #2, Navy Manpower and Material Analysis Center, Atlantic, "Shore Manning Document, NCS Washington, Cheltenham Survey Dates: 12 Sep-13 Oct 1972," Unclassified; "NCS San Francisco Survey Dates: 7 Nov-1 Dec 1972," Unclassified

A-2. OpNav 12P-4, "Guide to the Preparation of Ship Manning Document," Unclassified, 1971

A-3. Center for Naval Analyses Memorandum, (CNA)1878-74, "NAVCOMMSTA Manpower Planning Analysis, "Electronics Maintenance Division," Unclassified, 25 Nov 1974

APPENDIX A
ANNEX 1
DATA

TABLE I-1

ELECTRONICS MAINTENANCE DIVISION

CURRENT BILLET TITLES USED

(1) Master Billet or Position Title	(2) Hono Consolidated	(3) Hono W33	(4) Guam	(5) Norfolk	(6) Italy
Management (Group Office)		EMO (Elec. Maint. Officer) (A)*		EMO (Elec. Maint. Officer) (A)	EMO (A)
	Maintenance Officer (A)		Electronics/Plans Dep't Officer (A60)		
			Facilities Maint. Officer (A62)		
				Ass't EMO (B)	Ass't EMO (B)
				Assistant to EMO (C)	
				Secretary to EMO (D)	
1. Division Leading CPO		Same	Department CPO (60) Same (62) Telecomm Center Maint CPO N/H(65-1)* CPOINC (65-2)	Division Leading CPO	Division LPO
				Assistant to LCPO (E)	
	Leading Chief (B)				
2. ELX Instl & RP					
	3M Assistant (C)				
		Admin/Training/ 3-M Asst (B)*			
				3M Yeoman (F)	

TABLE I-1 (cont'd)

CURRENT BILLET TITLES USED

(1) Master Billet or Position Title	(2) Hono Consolidated	(3) Hono W33	(4) Guam	(5) Norfolk	(6) Italy
3. Maint. Watch Supervisor	Watch Supervisor	Same	Same (62D)		Watch Section Supervisor
	Maint. Supervisor (D)			Civilian Maint. Supervisor (G)	
				Maint. CPO (H)	
	Shop Supervisor (E)				
	Maint. Watch (K)				
4. Supervisory Electronic Tech.		Comm. Center Maint. Supvr.*			
5. Clerk (Typing)			Dep't Yeoman (60) Asst. to LCPO (62)		
6. Communications Specialist					AN/WSC-1 (TAC SAT) Technical
7. Communications Storekeeper		Elex. Div. Supply P.O*	Supply (62A)		Supply Petty Officer
				Supply Clerk (I)	
	Wire Systems/ Installation/AM & FM Receiver Branch				
			Test Equipment Supervisor (A-62E)		

TABLE I-1 (cont'd)

CURRENT BILLET TITLES USED

(1) Master Billet or Position Title	(2) Hono Consolidated	(3) Hono W33	(4) Guam	(5) Norfolk	(6) Italy
8. Test Equipment Coordinator			Same (62D) Test Equipment Technician (62E)		Supervisor Maint. Tech.
9. Branch Supervisor			PTF Maint. LPO (62D) Test Equipment CPOIC (62E) Test Equipment LPO (62E)		
10. Receiver Technician					
11. FM Mobile Technician					
12. Receiver Technician					
13. Electronics Tech/ Training		Test Equip Chief (E)*			Training Petty Officer
14. Calibration Technician		Test Equip Tech.*		Calibration Technician Test Equip Supervisor (Q) Electronic Tech. Supervisor (K) Electronic Mechanic (L)	
15. Electronics Technician				Electronic Technician	Electronics Technician
16. Test Equipment					Maint. Technician
17. Cross Connect Accountant					

TABLE I-1(cont'd)

CURRENT BILLET TITLES USED

(1) Master Billet or Position Title	(2) Hono Consolidated	(3) Hono W33	(4) Guam	(5) Norfolk	(6) Italy
			Wiring Supervisor (B 62C)		
18. Wire Systems Tech.			Wiring technician (62C) Same (62D)		
		Special Projects Supr. (H)*			
19. Installation Tech.	Installation Tech(N)	Special Projects Tech.*	Wiring Tech.(62D)		
20. Antenna Mechanic					
VFTG/Maps/Link Branch					
21. Branch Supervisor		Comm. Center Maint. Chief*	Microwave Maint. (CPO(62B) Shop Leading PO (62C) LPO (65-2)		M/W Supvr.
				M/W Maint. Supvr. (J)	
22. Maps Technician			Shop Supervisor (A-62C)		
23. VFTG/Multichannel Tech.		Microwave/VFCT Tech.* FMAT Supvr(C)*	Terminal team(62C)		Terminal Equip. Tech.

TABLE I-1(cont'd)

CURRENT BILLET TITLES USED

(1) Master Billet or Position Title	(2) Hono Consolidated	(3) Hono W33	(4) Guam	(5) Norfolk	(6) Italy
24. Microwave Technician		FMAT Tech.*	Same(62B)		M/W Tech.
			Microwave Technician LPO (A-62B)		
25. Microwave Maint.					M/W Maint. Technician
26. Electronics Mechanic					
Crypto Repair Branch					
27. Branch Supervisor					
28. KWT→37 Technician		CSE Repair*	Same(62C)		KWT/KWR-37 Technician
29. KG-14 Technician			Same(62C)		KG-14 Technician
	KG 20 Series Tech. (M)				
			KW-26 Technician (C-62C)		
			KW-7 Tech (D-65-2)		
			KY-3 Tech(C-65-2)		
				Cable Vault Supvr. (O)	
				Installation & Removal Technician (P)	

TABLE I-1 (cont'd)

CURRENT BILLET TITLES USED

(1) Master Billet or Position Title	(2) Hono Consolidated	(3) Hono W33	(4) Guam	(5) Norfolk	(6) Italy
			Crypto Technician (A-65-1)		
30. Electronics Technicial/Opr.					
31. Electronic Technician			Same (62C)		KW-26, KG-13, KY-3, KW-7 Technician
32. Supervisory Electronic Tech.			Watch Suprv. (62C)		
33. Electronic Mechanic (Crypto)			Watch Technician (62C)		
		DSTE Repair (D) *			
			DSTE Technician (B-65-1) DSTE Tech (A-65-2) DSTE Tech (B-65-2)		
	Secure Voice (J)				
Teletype Repair Branch					
		Teletype Repair Supvr (F) *			
34. Electronics Mechanic Foreman	TTY Repair Supvr.		Leading CPO (62A) *		
	TTY Repair/Maint. (O)				

TABLE I-1(cont'd)

CURRENT BILLET TITLES USED

(1) Master Billet or Position Title	(2) Hono Consolidated	(3) Hono W33	(4) Guam	(5) Norfolk	(6) Italy
35. Electronics Mechanic Leader			Leading PO (62A)*		
36. Electronic Mechanic	TTY Repair Watch	Teletype Equip Mechanic *	Teletype Repairman (62A)		
		Teletype Equip Mechanic(G)*			
				TTY Equip Supvr.(M) TTY Repair (N)	
	CSE Depot Repair(F) SVCT Maintenance(G) Steamvalve Maint.(H) ANAF(I) Plans/Projects(L)				
			Weather Equipment Technician(C-65-1) Harbor Master NAVSTA (D-65-1)		
				NTCC Breezy Point(R) NTCC Portsmouth(S)	

TABLE I-2

MANNING DISTRIBUTION

	Maintenance					Support					Total				
	Hono cons. maint.	Hono W33	Guam[a]	Norfolk	Italy	Hono cons. maint.	Hono W33	Guam[a]	Norfolk	Italy	Hono cons. maint.	Hono W33	Guam[a]	Norfolk	Italy
Direct labor															
Civilian	--	16	0.7	22.5	--	--	--	--	1	--	--	16	0.7	23.5	--
Military	47.6	55	14	20	24	0.8	--	4	3	--	48.4	55	18	23	24
Total	47.6	71	14.7	42.5	24	0.8	--	4	4	--	48.4	71	18.7→78.5	46.5	24
General management															
Civilian											--	--	--	1	--
Military											2	4	4	3	5
Total											2	4	4→4	4	5
Supervisors															
Civilian	--	--	0.3	5.75	--	--	--	--	--	--	--	--	0.3	5.75	--
Military	4.5	5	3	4.75	3	1.1	--	--	--	--	5.6	5	3	4.75	3
Total	4.5	5	3.3	10.5	3	1.1	--	--	--	--	5.6	5	3.3→13.5	10.5	3
Total personnel															
Civilian											--	16	1[b]	30.25	--
Military											56	64	94[b]	30.75	32
Total											56	80	95[b]	61	32

[a] Based on incomplete data submitted (only 26 persons).

[b] Includes billets with no information as to direct labor supervisory breakdown (69 persons).

TABLE I-3

MANNING DISTRIBUTION AND SUPERVISORY OVERHEAD RATES

	Maintenance					Support					Total				
	Hono cons. maint.	Hono W33	Guam	Norfolk	Italy	Hono cons. maint.	Hono W33	Guam[a]	Norfolk	Italy	Hono cons. maint.	Hono W33	Guam[a]	Norfolk	Italy
Direct labor															
Day	23.2	18	14.7	10.75	6.4	0.8	--	4	4	--	24	18	18.7	14.75	6.4
Watch	24.4	53	--	31.75	17.6	--	--	--	--	--	24.4	53	--	31.75	17.6
Total	47.6	71	14.7	42.5	24	0.8	--	4	4	--	48.4	71	18.7→78.5	46.5	24
General management All day											2	4	4→4	4	5
Supervisors															
Day	3.9	3	3.3	5.25	0.6	1.1	--	--	--	--	5	3	3.3	5.25	0.6
Watch	0.6	2	--	5.25	2.4	--	--	--	--	--	0.6	2	--	5.25	2.4
Total	4.5	5	3.3	10.5	3	1.1	--	--	--	--	5.6	5	3.3→13.5	10.5	3.0
Percent day	16.8	16.7	22.4	48.8	9.3	137.5	--	--	--	--	30.0	38.9	39.0	62.7	87.5
Percent watch	2.5	3.8	--	16.5	13.6	--	--	--	--	--	2.5	3.8	--	16.5	13.6
Percent total	9.5	7.0	22.4	24.7	12.5	137.5	--	--	--	--	15.9	12.7	39.0→22.3	29.0	33.3
Total Personnel															
Day											31	25	64[b]	24	12
Watch											25	55	31[b]	37	20
Total											56	80	95[b]	61	32

[a] Based on incomplete data submitted (only 26 persons).

[b] Includes billets with no information as to direct labor-supervisory breakdown (69 persons).

TABLE II-1

MANPOWER MAINTENANCE REQUIREMENTS

This table (see page A-27 for a sample of the data) is bound separately as Center for Naval Analyses Memorandum, CNA-1462-75, and is available upon request from:

Management Information Office
Center for Naval Analyses
1401 Wilson Boulevard
Arlington, Virginia 22209

TABLE II-1

MAINTENANCE MANPOWER REQUIREMENTS

(1) MAINT. NO.	(2) EQUIP. TYPE	(3) ORIG. MN. NO.	(4) NO. ON HAND/ACTIVE	(5) CONV. CM+PM REQ.	(6) PLANNED MAINT. STD. BY OPER. PERS.	(7) PLANNED MAINT. STD. BY MAINT. PERS.	(8) PLANNED MAINT. STD. TOTAL	(9) REQUIREMENT PM	(10) REQUIREMENT CM
1 -									
	++-60V POWER SUPPLIES								
	ITALY	50	2	-	-	-	-	-	-
2 -									
	SOLA FREQ + VOLT REGULATOR								
	ITALY	51	2	-	-	-	-	-	-
3 ALARM									
	ALARM BELL AND BUZZER								
	GUAM	115-116	2	4.1	-	4.0	4.0	4.0	0
	SCA STD			25					
4 BATTERIES									
	BATTERIES								
	GUAM	63,118	9	20.9	-	-	-	20.9	0
5 CABINETS + RACKS									
	VARIOUS								
	GUAM	114	41	8	-	8	8	23.4	0
6 EQUALIZER									
	AMPLITUDE EQUALIZERS								
	GUAM	107	180	.04	-	-	-	0	.04
7 EXECUTONE MODEL 1100									
	INTERCOMM SYSTEM								
	HONO W33	440	1	26	-	15	18	18	8
8 INTERCOMS									
	INTERCOMS								
	NORFOLK	338	13	13.5	-	-	-	0	13.5
9 KEPCO CO.									
	BATTERY P.S.								
	GUAM	524	4	0	-	-	-	0	0

TABLE II-2

EXTRA NON-CM JOBS

Recurring extra jobs

Guam

QCs on nonvon circuits are held an average of twice a year. Because of frequency of failure, it is felt that they should be scheduled quarterly, the same as von circuits, so problems can be corrected before they occur. Additional man-hours = 228.

Nonrecurring extra jobs

Hono (W33)

A one-time expenditure of 2,562 man-hours was required for the low-level conversion of this equipment:

	Man-hours
AN/FGC-100-MK-1099/UG	440
AN/FGC-79-MK-1098/UG	920
AN/UGC-20-MK-1158/UG	156
AN/UGC-25-MK-1090/UG	96
AN/UGC-5-MK-1087/UG	200
AN/UGC-6-MK-1088/UG	240
TT-176/UG-MK-1082/UG	64
TT-187/UG-MK-1100/UG	120
TT-192/UG-MK-1086/UG	142
TT-331A/UG-MK-1110/UG	48
TT-332A/UG-MK-1101/UG	16
TT-333A/UG-LL	120

TABLE II-3

RESULTS OF MAINTENANCE ANALYSIS

		(1) Hono cons.	(2) Hono W33	(3) Guam	(4) Norfolk	(5) Italy	(6) Op-124	(7) SCA
1	PMS standard (man-hours/yr)	14,480	32,205	27,014	39,348	9,018	-	-
2	Total PM req (man-hours/yr)	14,617	34,004	28,124	39,348	9,018	-	-
3	Extra non-CM jobs (man-hours/yr)	-	2,562	288	-	-	-	-
4	Conventional PM (man-hours/yr)	14,617	31,442	27,896	39,348	9,018	-	-
5	CM req (man-hours/yr)	2,861	16,332	9,924	38,067	7,458	-	-
6a	(PM req + CM req)/PMS	1.2	1.6	1.4	2.0	1.8	2.94	3
6b	Teletype: (PM req + CM req)/PMS	1.1	1.6	1.2	2.1	-	2.94	3
6c	Non-teletype: (PM req + CM req)/PMS	1.3	1.6	1.5	1.9	1.8	2.94	3
7	PM req/PMS	1.01	1.06	1.04	1.00	1.00	1.47	1.5
8	Conventional PM req/PMS	1.0	1.0	1.0	1.0	1.0	1	1
9	Extra jobs/PMS	0	.08	.01	0	0	0	0
10	CM req/(PMS x 1.47)	0.1	0.3	0.2	0.7	0.6	1	1
11	CM req/PMS	0.2	0.5	0.4	1.0	0.8	1.47	1.47

TABLE IV-1

SUPPORT PRIMARY DUTY BILLETS

	Master billet list	Hono ConsMaint	Hono W33	Guam	Norfolk	Italy
5	Clerk (typing)			Dep't yeoman		
				(B) Ass't to LCPO	(E) Ass't to LCPO	
7	Communications storekeeper			Supply	(I) Supply clerk	
				(D) Harbor Master Navsta	(D) Secretary to EMO	
					(F) 3M yeoman	

TABLE IV-2

SUPPORT COLLATERAL DUTY JOBS

	Hono CM		Hono W33		Guam		Norfolk		Italy	
Job type	Job number	Total man-hours	Job number	Total man-hours	Job number	Total man-hours	Job number	Total man-hours	Job number	Total man-hours
Travel	1	1,616	1-23	1,699	48,49,70-72 84,101,163-166, 185-187	4,093	1-14 35-47	1,116	4,5	708
Training (technical)					118,148,172	1,798				
Training (non-technical)	16,39	1,430	30-31	2,544	4,33,39, 82, 83100, 105,112,117, 147,197	8,178				
Cleaning	2-9,43	2,188	25-29	4,420	37,73,74,102, 103,113-116,139-142,167,184,193	7,275	17,26,31	750	2,3	1,196
Mil. watches	35-38,40	9,570	24	3,648	8,34,53 76,104,129,152, 176,192,201	5,712				
Meetings	19,21-27, 42	804			11,18,26,58a 59,80,86,131, 157,181,171	3,730				
Burn runs, etc.	47	104	35	328	1	26	18,27,34	450		
Admin (record keeping, reports, typing, etc.)	11-15,17,18,20, 32,45,49, 50,51	3,433	33,36	1,495	3,5-7,13,15,16, 19-21,23,25,28,30, 31,52,54,55 61,62,69,77,85, 87,98,99,110, 120,127,134,135, 149,150,154,158,161, 168-170,183,188 194,198	14,386	19,23,24, 28,32	536	9,10,12	370
Mail	10	130			9,29,99,130	851	22	75		
Supply, inventory, etc.	28-31,41	3,620			22,45,51 64,65,66,88, 90,122,123 126,145,146,155, 182,196	6,290	20,25,29 30	1,250		
Inspections	34	1,320			2,32,57,66 67,97,119,143 175,190	2,371			11	180
Bldg. Maint.	46	104			38,42	280				
Escorting	48	1,092							6	2,900
Collecting, moving, equipment	44	104			43,46	2,232	33	100	7	100
Misc. support maint.			32, 37-39	4,240	44,91,92,94 124,137,138, 144,177,200	15,782	16,21	4,832	8	822
No-break checks							15	3,458	1	1,055
Vehicle maint.			34	208						
Exams					12,56,80,108, 132,158,174,180	483				
Special projects					24,95,125	594				
Customs					41,111	2,180				
Quarters					58,79,93 128,151,189	7,267				
Nonallowable – coffee, football, leave, supervisory, etc.	33	–			10,14,17,27, 35,36,40,47, 50,63,75,76, 81,89,106,107,109, 121,133,136,153, 156,160,162,173, 178,179,191,195,199	–				

TABLE IV-3

CURRENT SUPPORT MANPOWER REQUIREMENT

A review of the data describing the support jobs listed in this table showed:

- Arithmetic inconsistencies in the data in different columns pertaining to the same job.
- Omissions in data describing a particular job.

Each job containing either problem is indicated by a question mark (?) in column 1. During its review, each site should give special attention to these shortcomings and add to or modify the data so that the jobs can be validated by the command.

Table IV-3 CURRENT SUPPORT MANPOWER REQUIREMENT

SITE LOCATION: Hono CM FUNCTION: Electronics Maintenance Division 12 MONTH PERIOD COVERED: From 1 Jan 1974 To 1 Jan 1975

(1) JOB	(2) DESCRIPTION	(3) WORK UNIT	(4) man/ HOURS TO COMPLETE	(5) NUMBER OF WORK UNITS PER WEEK	(6) man/ TOTAL HOURS PER YEAR	(7) BILLET NUMBER
1.	Travel(total) Dec 25-73-Dec 25 74	Trip			1616	All
2.	Consolidated Maintenance Sweepdowns	Cleaning	0.3	42	655.2	F,K,M,N,36
3.	Consolidated Maintenance Field Days	Cleaning	4.0	5	1040.0	F,K,M,N,36
4.	CINCPACFLT Sweepdowns	Cleaning	.4	5	104.0	F,K,M,N,36
5.	CINCPACFLT Field Day	Cleaning	4.0	.25	52.0	F,K,M,N,36
6.	Secure Voice (SVCT) Field Day	Cleaning	2.0	1	104.0	G,H
7.	Secure Voice (ANAF) Sweepdown	Cleaning	.1	1	5.2	J
8.	Secure Voice(ANAF) Field Day	Cleaning	2.0	1	104.0	I
9.	CINCPAC Field Day	Cleaning	1.5	.25	19.5	F,K,M,N,36
10.	Mail and Traffic Runs	Walking	0.25	10	130.0	F,L
11.	Filling out Maint. Forms(2K & 1250s)	Clerical	0.25	70	910.0	D,F,G,H,I, J,M,N
12.	Typing Memos	Clerical	0.5	5	130.0	All
13.	Quarterly PM Revision and Preparing quarterly PM schedules	Administration	48.0	Once per quarter	192.0	C,O
14.	PM Inspections	Administration	3.0	1	156.0	C,O
15.	PM Daily Admin(reports & Follow ups)	Administration	2.0	5	520.0	C,O
16.	Race Relations Training(upwards)	Training	24.0	55(persons)	1320.0	All

TABLE IV-3 CURRENT SUPPORT MANPOWER REQUIREMENT

SITE LOCATION: Hono CM FUNCTION: Electronics Maintenance Division 12 MONTH PERIOD COVERED: From 1 Jan 1974 To 1 Jan 1975

(1) JOB	(2) DESCRIPTION	(3) WORK UNIT	(4) man/ HOURS TO COMPLETE	(5) NUMBER OF WORK UNITS PER WEEK	(6) man/ TOTAL HOURS PER YEAR	(7) BILLET NUMBER
17.	Preparing Quarterly Trng. Report	Training Administration	2.0	once per quarter	8.0	C
18.	Procuring Training Materials	Training	3.0	1	156.0	C
19.	Career Counseling and disseminating information	Counseling	1.0	5	260.0	L
20.	Preparing Career Counseling Report	Clerical	0.5	once per month	6.0	L
21.	Career Counsellor Meetings	Trip/Training	5.0	once per month	60.0	L
22.	Sailor of the quarter Selection Board	Trip/Collateral	4.0	once per quarter	16.0	L
23.	CPO Club Advisory Board	Collateral	4.0	once per month	48.0	L
24.	Division Officer Meeting	Administrative	2.0	1	104.0	A
25.	Division Chief Meeting	Administrative	2.0	once per month	24.0	B,D,L,34
26.	Division Officer-Chief Meetings	Administrative	1.0	4	208.0	A,B,D,L,34
27.	Enlisted Club Advisory Meeting	Collateral	3.0	once per month	36.0	I
28.	Inventory Test Equipment and CMS Materials	Inventory	1.0	21	1092.0	K
29.	Inventory Q-kits	Inventory	4.0	1	208.0	F,K,J
30.	Page Check Kams	Inventory	4.0	once per month	48.0	F,K,J
31.	Inventory Plant Account Equipment	Inventory	24.0	2 people quarterly	192.0	F
32.	Writing Personnel Evaluations		4.0	55 people annually	220.0	A,B,D,E,3,34 O

TABLE IV-3 CURRENT SUPPORT MANPOWER REQUIREMENT

Electronics Maintenance Division

SITE LOCATION: Hono CM FUNCTION: 12 MONTH PERIOD COVERED: From 1 Jan 1974 To 1 Jan 1975

(1) JOB	(2) DESCRIPTION	(3) WORK UNIT	(4) man/ HOURS TO COMPLETE	(5) NUMBER OF WORK UNITS PER WEEK	(6) man/ TOTAL HOURS PER YEAR	(7) BILLET NUMBER
33.	Making Coffee		0.1	21	109.2	F,K
34.	Preparing for and standing personnel inspections		2.0	55 people monthly	1320.0	All
35.	Barracks Watch	Watch	8.0	2 per month	192.0	E,F,G,H,I,J,M
36.	NAVCOMMSTA OOD	Watch	8.0	3 per month	288.0	B,D,L,34
37.	U.P.S. Checks Daily	Watch	.3	21	327.6	K
38.	U.P.S Checks Weekly	Watch	.5	1	26.0	K
39.	U.P.S. Training	Train	2.0	55 people yearly	110.0	All
40.	Phone Watch	Watch	8.0	21	8736.0	3,K
41.	Supply	Clerical	8.0	5	2080.0	F
42.	Special Service Audit Board	Collateral	24.0	1 person semi-annual	48.0	L
43.	U.P.S. Bldg. Field Day	Cleaning	2.0	1	104.0	F,G,H,J,K
44.	Taking Test Equip. to calibration	Collecting	1.0	2	104.0	F
45.	Training Report	Clerical	0.5	once per month	6.0	C
46.	Bldg. Maintenance	Repair	2.0	1	104.0	M,N,36 F,G,H,J,K,L
47.	Working Parties	Various	2.0	1	104.0	F,K,M,N
48.	Escorting "uncleared" Personnel	Escorting	3.0	7	1092.0	F,G,H,I,J,K, M,N,36

Table IV-3 CURRENT SUPPORT MANPOWER REQUIREMENT

SITE LOCATION: Hono CM FUNCTION: Electronics Maintenance Division 12 MONTH PERIOD COVERED: From 1 Jan 1974 To 1 Jan 1975

(1) JOB	(2) DESCRIPTION	(3) WORK UNIT	(4) man/ HOURS TO COMPLETE	(5) NUMBER OF WORK UNITS PER WEEK	(6) man/ TOTAL HOURS PER YEAR	(7) BILLET NUMBER
49.	Preparation for PMs	Maint. Support			1015.0	E,F,G,H,I,J, 3, K,M,N,O, 36
50.	A,N,A,F. Report		8.0	once per month	96.0	D,I
51.	SVCT Report		1.5	once per month	18.0	D,J

TABLE IV-3 CURRENT SUPPORT MANPOWER REQUIREMENT- TRANSPORTATION REQUIREMENTS

NAVCOMMSTA Honolulu

SITE LOCATION: Wahiawa - W33 Division FUNCTION: Electronics Maintenance Division 12 MONTH PERIOD COVERED: From 1 January 1974 To 1 January 1975

(1) JOB	(2) DESCRIPTION	(3) WORK UNIT	(4) MANHOURS TO COMPLETE	(5) NUMBER OF WORK UNITS PER WEEK	(6) MAN TOTAL/HOURS PER YEAR	(7) BILLET NUMBER
1.	Kole Kole Pass Microwave Tower	Trip	1 R/T	1(1)	52	24 (4)
	Mileage 1 way - 10 mi.					
2.	Test Equip Repair(Bldg 79)-Deliver/Pick-up test equipment Mileage 1 way - 1 mi	Trip	.25 R/T	4(1)	52	28 (24) 23 (13) D(4)
3.	Test Equip Repair(Bldg 79)-Visit Coordination Mileage 1 way - 1 mi.	Trip	.25 R/T	1(2)	26	A(1) 1(1)
4.	NSC Pearl Harbor-Servmart Mileage 1 way - 20 mi.	Trip	1.5 R/T	1 trip(QTR(1)	6	7(1)
5.	SATCOMM Site-TTY PM/DM Mileage 1 way - 9 mi.	Trip	.75 R/T	78 PMS/Yr(2) 30 COR/Yr(2)	117 45	36(10)G(3)
6.	RCVR Site-TTY PM/DM Mileage 1 Way-1 mi.	Trip	.25 R/T	408 PMS/Yr(2) 78 COR/Yr(2)	204 117	36(10)G(3)
7.	Transmitter Site-TTY PM/DM Mileage 1 way - 18 mi.	Trip	1.5 R/T	126 PMS/Yr(2) 3 COR/Yr(2)	378 9	36(10)G(3)
8.	SPECOMM Site-TTY PM/DM Mileage 1 way-1 mi.	Trip	.25 R/T	56 PMS/Yr(2) 6 COR/Yr(2)	28 3	36(10) G(3)
9.	NAVSEAPACPearl Harbor Mileage 1 way- 20 mi.	Trip	1.25 R/T	1(1)	65	H(1)
10.	Transmitter Site-Microwave PM/DM Mileage 1 way - 18 mi.	Trip	1.5 R/T	2 PMS/YR(1) 6 COR/YR(1)	45 9	C(1) 24 (4)
11.	SATCOMM Site - Microwave PM/DM Mileage 1 way - 9 mi.	Trip	.75 R/T	2 PMS/YR(1) 2 COR/Yr(1)	22.5 1.5	C(1) 24(4)
12.	CINCPAC-Microwave PM/DM Mileage 1 way - 21 mi.	Trip	1.5 R/T	2 PMS/Yr(1) 2 COR/Yr(1)	45 3	C(1) 24(4)
13.	CINCPACFLT-Microwave PM/DM Mileage 1 way - 18 mi.	Trip	1.5 R/T	2 PMS/Yr(1) 2 COR/Yr(1)	45 3	C(1) 24(4)
14.	KUNIA-Microwave/PM/DM	Trip	1 R/T	2 PMS/Yr(1) 2 COR/Yr(1)	30 2	C(1) 24(4)
15.	Ford Island-Microwave PM/DM Mileage 1 way - 25 mi.	Trip	2.95 R/T	2 PMS/Yr(1) 2 COR/Yr(1)	88.5 5.9	C(1) 24(4)

TABLE IV-3: CURRENT SUPPORT MANPOWER REQUIREMENT- TRANSPORTATION REQUIREMENTS
NAVCOMMSTA Honolulu

SITE LOCATION: Wahiawa - W33 Division FUNCTION: Electronics Maintenance Division 12 MONTH PERIOD COVERED: From 1 January 1974 To 1 January 1975

(1) JOB	(2) DESCRIPTION	(3) WORK UNIT	(4) MAN HOURS TO COMPLETE	(5) NUMBER OF WORK UNITS PER WEEK	(6) MAN TOTAL HOURS PER YEAR	(7) BILLET NUMBER
16.	Hickam AFB-Microwave PM/DM Mileage 1 way - 25 mi.	Trip	1.5 R/T	4 PMS/Yr(1) 4 COR/Yr(1)	90 6	C(1)24(4)
17.	Supply Dept. (Wahiawa) Mileage 1 way - .5 mi.	Trip	.25 R/T	2	26	7(1)
18.	Barbers Point-Microwave PM/DM Mileage 1 way - 20 mi.	Trip	1.5 R/T	2 PM/Yr(1) 2 COR/Yr(1)	45 3	C(1) 24(4)
19.	Bldg. 261 - Div. Supply Mileage 1 way - 1 mi.	Trip	.2 R/T	10	104	E(1) 14(7)
20.	Transmitter Site- on site calibration Mileage 1 way - 18 mi.	Trip	1.5 R/T	1 PM/QTR	6	E(1) 14(1)
21.	Barbers Point- on site calibration Mileage 1 way - 20 mi.	Trip	1.5 R/T	1 PM/QTR	6	E(1) 14(1)
22.	Bldg. 261 - on site calibration Mileage 1 way - 1 mi.	Trip	.25 R/T	1 PM/QTR	1	E(1) 14(1)
23.	Consolidated Maint. Div. Pearl Harbor- on site calibration	Trip	2.5 R/T	1 PM/QTR	10	E(1) 14(1)
	Mileage 1 way - 35 mi.					
24.	Military Watches	Watch	8	1.8(21)	3648	21(1) E(1)F(1) H(1) 14(6)G(3)
25.	Comm. Center Maint Branch-Cleaning	Cleaning	4	3.5(4)	2912	23(13) 28(24) D(4)
26.	Teletype Repair Branch-Cleaning	Cleaning	1	7(1)	364	36(10) G(3)
27.	Test Equip. Repair Branch-Cleaning	Cleaning	.7	10(5)	884	14(7)
28.	FMAT Branch-Cleaning	Cleaning	.5	5(1)	130	C(1) 24(4)
29.	Special Projects Branch - Cleaning	Cleaning	.5	5(1)	130	19(1)
30.	Upward Training	Training	32	1.16(1)	1920	All Div Pers

TABLE IV-3 CURRENT SUPPORT MANPOWER REQUIREMENT – TRANSPORTATION REQUIREMENTS

SITE LOCATION: NAVCOMMSTA Honolulu Wahiawa – W33 Division FUNCTION: Electronics Maintenance Division 12 MONTH PERIOD COVERED: From 1 January 1974 To 1 January 1975

(1) JOB	(2) DESCRIPTION	(3) WORK UNIT	(4) MAN HOURS TO COMPLETE	(5) NUMBER OF WORK UNITS PER WEEK	(6) MAN TOTAL HOURS PER YEAR	(7) BILLET NUMBER
31.	3-M Training-Ford Island	Training	24	.5(1)	624	3(4) C(1) 24(4) 23(13)
						28(24) D(4) 14(7) G(3)
32.	Test Equip Calibration Recall Program	Computer Run	20	1/mo.	240	14(2)
33.	PMS/MDCS Document screening and MDCS reports preparation	Admin	10	1	520	21(1) F(1) E(1)
34.	Vehicle Maint	Cleaning	2	2	208	23(13) 36(10)
35.	Burn Run	Destruction	3	2	328	21(1) 4(1) C(1) 24(4) E(1) 14(5)
						F(1) G(3) H(1) 19(1) 23(13)
36.	OPNAV 4790.2K Preparation	Admin	.25	75	975	3(4) C(1) 24(4) 23(13) 28(24)
						D(4) E(1) 14(7) 36(10)
						F(1) G(3)
37.	A one-time expenditure of approx. 1000 man-hours was required to write/ review/rewrite the Command Test Equipment Calibration Recall Program				1000	14(2)
38.	A one-time expenditure of 1500 manhours was required to relocate the Test Equipment Repair and Calibration Facility to its present location (Bldg 79) and renovating the new facility				1500	E, 14(7)

TABLE IV-3 : CURRENT SUPPORT MANPOWER REQUIREMENT- TRANSPORTATION REQUIREMENTS

SITE LOCATION: NAVCOMMSTA Honolulu Wahiawa - W33 Division FUNCTION: Electronics Maintenance Division 12 MONTH PERIOD COVERED: From 1 January 1974 To 1 January 1975

(1) JOB	(2) DESCRIPTION	(3) WORK UNIT	(4) MAN HOURS TO COMPLETE	(5) NUMBER OF WORK UNITS PER WEEK	(6) MAN TOTAL HOURS PER YEAR	(7) BILLET NUMBER
39.	Assisting NAVSEEAPAC and station forces on installation and/or removal of electronics equipment relative to ComNavTelCom projects				1500	19

IV-3

TABLE / CURRENT SUPPORT MANPOWER REQUIREMENT

SITE LOCATION: NCS GUAM FUNCTION: ELECTRONICS/PLANS DEPARTMENT 12 MONTH PERIDD COVERED: From 1 OCT 73 To 30 SEP 74

(1) JOB	(2) DESCRIPTION	(3) WORK UNIT	(4) MANHOURS HOURS TO COMPLETE	(5) NUMBER OF WORK UNITS PER WEEK	(6) MAN TOTAL/HOURS PER YEAR	(7) BILLET NUMBER
1	Prepare and dispose of burn bags	Cleaning	.5	1	26	5
2	Personnel inspection	Inspections	2	1/mon.	24	A,1,5
3	PECI reporting	Records	8	1.5	624	1
4	Training, general military	Training	1	1	52	1,5
5	Filing, message/pubs/letters	Filing	1.5	1	78	5
6	Preparing correspondence	Reports	2	5	520	A,1
7	Typing	Reports	4	5	1040	5
8	Watches	Military duties	8	2/mon.	192	1,5
9	U.S./guard mail	Messenger services	1.5	5	390	5
10	Leave	Leave		30 days/yr/man	-	A,1,5
11	Meeting, conferences, liaison	Conference	1.5	5	390	A,1
12	Exams/practical factors/mil leadership	Examination	5	1/yr	5	1,5
13	Disb/eso/pers/admin/legal/etc.	Admin trip	.5	1	26	A,1,5
14	Medical/dental/hospital	Sick call				A,1,5
15	Telephone calls		2	5	520	A,1,5
16	Budget	Reports	1	1	52	A,5
17	Supervision	Supervisor	3	5	780	A,1

V 60

IV-3

TABLE / CURRENT SUPPORT MANPOWER REQUIREMENT

SITE LOCATION: NCS GUAM FUNCTION: ELECTRONICS/PLANS DEPT 12 MONTH PERIOD COVERED: From 1 OCT 73 To 30 SEP 74

(1)	(2)	(3)	(4)	(5)	(6)	(7)
JOB	DESCRIPTION	WORK UNIT	MANHOURS TO COMPLETE	NUMBER OF WORK UNITS PER WEEK	MAN TOTAL/HOURS PER YEAR	BILLET NUMBER
18	SWO/REC committee	Collateral duties	2	1	104	A

IV-3

TABLE / CURRENT SUPPORT MANPOWER REQUIREMENT

SITE LOCATION: NCS GUAM FUNCTION: FACILITIES MAINT. DIV 12 MONTH PERIOD COVERED: From 1 OCT 73 To 30 SEP 74

DIV 62

(1) JOB	(2) DESCRIPTION	(3) WORK UNIT	(4) MANHOURS TO COMPLETE	(5) NUMBER OF WORK UNITS PER WEEK	(6) MAN TOTAL HOURS PER YEAR	(7) BILLET NUMBER
(?) 19	Reports	Administrative			693	A,1,5
(?) 20	Directives and correspondence	Administrative			470	A,1
(?) 21	Liaison	Liaison			720	A,1
(?) 22	Supply	Manage			125	A,1
(?) 24	Special projects	Various			242	A,1
(?) 25	Phone calls				365	A,1,5
(?) 26	Conferences	Manage			648	A,1
(?) 27	Supervise	Supervise			584	A,1
(?) 28	Budget	Manage			60	A,1
(?) 29	U.S./guard mail	Administrative			125	5
(?) 30	Watch, quarter and station bill	Administrative			50	5
(?) 31	Typing	Administrative			500	5
(?) 32	Inspections	Personnel			75	A,1,5
(?) 33	Training	Instruction			412	A,1,5
(?) 34	Watches	Military			496	A,1,5
(?) 35	Leave	Administrative			560	A,1,5
(?) 23	Records	Administrative			220	A,1,5

IV-3

TABLE / CURRENT SUPPORT MANPOWER REQUIREMENT

SITE LOCATION: NCS GUAM FUNCTION: FACILITIES MAINT. DIV. 12 MONTH PERIOD COVERED: From 1 OCT 73 To 30 SEP 74

(1) JOB	(2) DESCRIPTION	(3) WORK UNIT	(4) MANHOURS TO COMPLETE	(5) NUMBER OF WORK UNITS PER WEEK	(6) MAN TOTAL HOURS PER YEAR	(7) BILLET NUMBER
(?) 36	Medical/dental				120	A,1,5
(?) 37	Clean shop Clean assigned spaces Wash truck	Clean assigned spaces	4 per wk; 5 and 3	5 5 1 per mo	2496; 260; 36	36(12); 36(2); 36(2)
(?) 38	Build office in shop	Build office	40	1	40	35
(?) 39	Military prof	Training	1	1	968	34; 35; 36(13)
(?) 40	Navy shooting football	Varsity sports	360; 320	5	360; 320	35; 36(3)
41	HHG inspector	Customs	100	-	100	35
(?) 42	Paint shop	Painting	240	3	240	36(10)
(?) 43	Transport TTY Equip down island	Transport TTY equip	3	1	312	
(?) 44	PMS inspections	PMS	NCS 1.4 Down Is. 1	.25 .25	120.8	34 35
(?) 45	Servmart runs; supply P.O.	Supply	5; 8 day	.25 5	120 2080	36(2) 36
46	Inventory TTY equip sort load for trans	Survey	1920	-	1920	36(8)
(?) 47	Physicals/sick call	Med/dental	20 9.3	- -	500 232.5	34; 35; 36(23)
(?) 48	PMS travel down Is.	Travel	12.8	-	1331.2	36(2)
(?) 49	PMS travel (NCS)	Travel	1	4	208	36
50	Leave	Leave		30 per man per yr		34; 35 36(18)
(?) 51	Reconfigure supply	Supply arrangement	40	1	40	36
(?) 52	Admin/pers/leg/disp/etc.	Administration		.5		

DIV 62

TABLE IV-3 CURRENT SUPPORT MANPOWER REQUIREMENT

SITE LOCATION: NCS GUAM FUNCTION: ELECTRONICS/PLANS DEPT 12 MONTH PERIOD COVERED: From 1 OCT 73 To 30 SEP 74

(1) JOB	(2) DESCRIPTION	(3) WORK UNIT	(4) MAN HOURS TO COMPLETE	(5) NUMBER OF WORK UNITS PER WEEK	(6) MAN TOTAL HOURS PER YEAR	(7) BILLET NUMBER
53	Military	Watches	8	2/mo	192	34;35;36
(?) 54	Evaluations/watch bills/insp repts/ PMS reports (etc.)	Reports	5		750	34;35;36
(?) 55	Sponsor program	Sponsor	6		60	34;35;36
(?) 56	Advancement exams	Exams	3	2/yr	150	34;35;36
(?) 57	Captains insp	Inspection	2	12/yr	212	34;35;36
(?) 58	Morning qtrs	Qtrs	15/day	5	3900	34;35;36
(?) 58a	Meetings/div off/payday/etc.	Conferences			412	34;35;36
(?) 59	Supervisory mtgs/conferences,counselling	Meetings	-	-	624	21(1);24(1)
60	Collateral duty meetings	Meetings	1.5	1/mo	18	21(1)
(?) 61	Admin rept preparation, turn-in	Reports	-	-	866	21(1);24(7)
(?) 62	Administrative record keeping	Records	-	-	345	21(1);24(1)
(?) 63	Shop supervision and management	Supervision	-	-	2800	21(1),24(1)
64	Review of supply requests	Supply	.5	1	26	21(1)
65	Parts requisitions and paperwork	Supply	7.25	1	377	24(1)
(?) 66	Personnel inspections	Inspections	2	1/mo	120	21(1),24(4)
(?) 67	Operational insp (DCA,NavSeeAPAC)	Non command insp	-	-	644	21(1),24(7)
(?) 68	Shop inventories	Inventory	-	-	120	21(1),24(7)

IV-3

TABLE V CURRENT SUPPORT MANPOWER REQUIREMENT

SITE LOCATION: NCS GUAM FUNCTION: ELECTRONICS/PLANS DEPT 12 MONTH PERIOD COVERED: From 1 OCT 73 To 30 SEP 74

(1) JOB	(2) DESCRIPTION	(3) WORK UNIT	(4) MAN HOURS TO COMPLETE	(5) NUMBER OF WORK UNITS PER WEEK	(6) MAN TOTAL HOURS PER YEAR	(7) BILLET NUMBER
(?) 69	Make publication changes	Publications	-	-	96	21(1),24(7)
(?) 70	Travel to radio barrigada	Travel	1 hr r/t	4	416	21(1),24(7)
(?) 71	Travel to Nimitz Hill	Travel	1.5 hr r/t	4	624	21(1),24(7)
(?) 72	Travel to NAS	Travel	1 hr r/t	-	240	21(1),24(7)
(?) 73	Field day of space	Cleaning	4	1/mo	192	24(4)
(?) 74	Space clean up	Cleaning	.25	5	260	24(4)
75	Leave	Leave	30 days per yr per man			21(1),24(7)
(?) 76	Medical/dental	Sick call	-	-	148	21(1),24(7)
(?) 77	Admin/pers/legal/disbursing/etc.	Administrative	.5	1	208	21(1),24(7)
(?) 78	Military watches	Watches	16	mo	1536	21(1),24(7)
(?) 79	Quarters	Quarters	.25	5	520	21(1),24(7)
(?) 80	Advancement examinations	Examinations	4	-	16	24(4)
(?) 81	Athletic competition	Varsity sports	-	-	720	24(7)
(?) 82	Military training	Training	.5	1	208	21(1),24(7)
(?) 83	Professional training	Training	-	-	1068	21(1),24(7)
84	Messenger service	Travel	1.5	5	390	21(1),24(7)
85	Review of outage log, corres. review drafting instruction, watchbills, eval., work request, budget prep., manpower, PM scheds.	Reports	4.5	5	1170	21/A/B/32

DIV 62C

IV-3

TABLE / CURRENT SUPPORT MANPOWER REQUIREMENT

SITE LOCATION: NCS GUAM FUNCTION: FACILITies DIV 12 MONTH PERIOD COVERED: From 1 OCT 73 To 30 SEP 74

(1) JOB	(2) DESCRIPTION	(3) WORK UNIT	(4) MAN HOURS TO COMPLETE	(5) NUMBER OF WORK UNITS PER WEEK	(6) MAN TOTAL HOURS PER YEAR	(7) BILLET NUMBER
86	Liaison w/shop supervisors/workload conferences collateral duty mtg, counseling div. pers.	Meeting/conferences/ counseling	2.2	5	572	21/A/B/32/18
87	Maintain files, watchbills, training, CMS material destruction	Records	2	5	520	21/A/32
88	Review supply request, pickup, research FSNs, log, type, file requisitions	Supply	5	5	1300	A/B/C/21/23/ 32/33
89	Shop insp, installation insp, personnel status board, assign work details, review shop log, PM sheet review, status report review	Supervisory	13.2	5	3432	21/A/B/32
90	Crypto pub inventory, test equipment inventory, spare parts, watch to watch	Inventory	1	21	1092	21/A/32/C
(?) 91	As builts, circuit info, assistance phone relocation, posting record cards, labeling circuits, operator assistance	Drafting schematics/ circuit records	4	5	3120	All
92	Installation assistance	Contractor assistance	3	5	780	B/c/18/23/28/ 29/31/32/33
(?) 93	Morning briefings	Quarters	15 min/day/man	5	1495	All
(?) 94	Installation troubleshooting for acceptance, assist other commands	Tech assistance	2.0	1/mo	240	All
(?) 95	Mobile radio checkout, PA system check	Special projects	5		180	21/23/33
96	Technical	Phone calls	1	7	365	All
(?) 97	Personnel	Inspections	2	1/mo	552	All
98	Install amendments, changes, paychecks	Publication upkeep	4	monthly	48	21/A/C/28/ 29/32/33
(?) 99	Pickup & deliver paychecks, guard mail, regular mail	Messenger service	1	5	245	21/23/33/A
100	OJT, training sessions, lectures prof	Training	continuous	7	2920	All

IV-3

TABLE V. CURRENT SUPPORT MANPOWER REQUIREMENT

SITE LOCATION: NCS GUAM FUNCTION: ELECTRONICS/PLANS DEPT 12 MONTH PERIOD COVERED: From 1 OCT 73 To 30 OCT 74

(1) JOB	(2) DESCRIPTION	(3) WORK UNIT	(4) MAN HOURS TO COMPLETE	(5) NUMBER OF WORK UNITS PER WEEK	(6) MAN TOTAL HOURS PER YEAR	(7) BILLET NUMBER
101	Travel remote site (13-15 miles one way)	Travel	1.5 rd trip	2/mo	36	C
102	Daily clean up 20 min 3X/day	Cleaning	1	7	365	C/18/23/28 29/31/32/33
103	Field day	Cleaning	4	2	416	C/18/23/28/ 29/31/32/33
(?) 104	Watches	Military	8	2/mo	1344	21/A/B/C/18/ 28
(?) 105	GMT	Training	1	1	1116	All
(?) 106	Football	Varsity sports	3	5	900	32/31/23/28
107	Leave				30 day/yr/man	All
(?) 108	Advancement, prac facs	Examinations	8 hr/yr/man		184	
(?) 109	Medical/dental/therapy	Sick call	3	5/16 wks	960	21/33/C/28
(?) 110	Admin, personnel, legal, etc.	Administrative trip	½hr/wk/man		598	All
(?) 111	Custom inspections	Collateral	8	2.5	2080	23/33
(?) 112	Upwards, race relations, drug abuse	Seminars	30hrs/yr/man		690	All
113	Shop field day	Cleaning	1.5	1	234	8/18/19
114	Dept office field day	Cleaning	1.5	1	234	8/18/19
115	Daily shop cleanup	Cleaning	.5	6	312	18/19
116	Daily office cleanup	Cleaning	.5	4	208	18/19
(?) 117	Training, GMT	Training	-	-	276	3(4), 8, 18(2), 19(2), 9(2)

A-48

DIV 62D

TABLE V. CURRENT SUPPORT MANPOWER REQUIREMENT IV-3

SITE LOCATION: NCS GUAM FUNCTION: ELECTRONICS/PLANS DEPT 12 MONTH PERIOD COVEREO: From 1 OCT 73 To 30 OCT 74

(1) JOB	(2) DESCRIPTION	(3) WORK UNIT	(4) MAN HOURS TO COMPLETE	(5) NUMBER OF WORK UNITS PER WEEK	(6) MAN TOTAL HOURS PER YEAR	(7) BILLET NUMBER
118	Training, technical	Training	3	1	1716	3(4), 8, 18(2), 19(2), 9(2)
119	Inspections	Personnel	2/mo	12/yr	264	3(4), 8, 18(2), 19(2), 9(2)
(?) 120	PMS schedule and reports	Paper work	-	-	352	9(2)
121	Leave			30 days/yr/man		3(4), 8, 18(2), 19(2), 9(2)
122	Picking up supplies	Supply	.25	1	26	18/19
123	Making out supply chits	Supply	.25	1	26	18/19
124	Main frame wiring	Wiring or configuration	3	7	8736	3(4),18(2),19(2)
(?) 125	Special projects		-	-	172	18/19
(?) 126	Shop inventories	Inventory	-	-	104	8/3
127	Publication maintenance		1	1 hr/mo	12	9
128	Quarters	Instruction & insp.	15 min/day/man	5	702	3(4), 8, 18(2), 19(2), 9(2)
129	Military watches	Watch	8	2/mo	192	9(2)
(?) 130	Mail, guard mail, messages, pickup and delivery	Messenger	.25	1/day	91	18
131	Meetings, conferences & counselling	Meetings	1	5	260	9
(?) 132	Examinations	Test	4		92	9(2), 8,3(4), 18(2), 19(2)
(?) 133	Medical/dental	Medical	-	-	127	9(2),8,3(4), 18(2), 19(2)
134	Admin, personnel, legal, etc	Admin trip		.5 hr/wk/man	286	9(2),8, 3(4),18(2),19(2)

IV-3

TABLE V: CURRENT SUPPORT MANPOWER REQUIREMENT

SITE LOCATION: NCS GUAM FUNCTION: ELECTRONICS/PLANS DEPT 12 MONTH PERIOD COVERED: From 1 OCT 73 To 30 SEP 74

(1) JOB	(2) DESCRIPTION	(3) WORK UNIT	(4) MAN HOURS TO COMPLETE	(5) NUMBER OF WORK UNITS PER WEEK	(6) MAN TOTAL HOURS PER YEAR	(7) BILLET NUMBER
135	Telephone	Phone calls	2 hrs/day	7	728	9/3
136	Assign work, inspections, oversee shop	Supervision	4 hr/day	5	2080	9(2)
(?) 137	Draw & design circuit layout records	Drafting schematics/ CLRs	2 hr/day	7	1456	18(2),19(2)
(?) 138	Contractor assistance	Assistance	-	-	300	9(2),18(2), 19(2)
(?) 139	Field day in shop	Cleaning	1.5	1	780	8(1)
(?) 140	Field day in dept office	Cleaning	1.5	1	780	8(1)
141	Cleanup in shop	Cleaning	.5	4	208	8(2)
142	Cleanup in dept office	Cleaning	.5	4	104	8(1)
143	Personnel inspection	Inspection	2	1/mo	24	8-9
144	Equip prep for/from calib		17.8	1	925.6	8-9-A
145	Equip custody inventory	Records	3	1	312	9-A
146	Supply research, requisitioning, pickup	Supply	5.5	1	286	8(1)
(?) 147	Training, general military	Training	1	1	208	8-9
(?) 148	Training, technical	Training	1	6/yr	30	8-9-A
149	Publication maintenance	filing	8	1/yr	8	8-9
150	Preparing misc reports, schedules	Reports	2	1	208	9-A
(?) 151	Quarters	Military duties	.25	5	260	8-9

DIV 62E

A-50

IV-3

TABLE V CURRENT SUPPORT MANPOWER REQUIREMENT

SITE LOCATION: NCS GUAM FUNCTION: ELECTRONICS/PLANS DEPT 12 MONTH PERIOD COVERED: From 1 OCT 73 To 30 SEP 74

(1) JOB	(2) DESCRIPTION	(3) WORK UNIT	(4) MAN HOURS TO COMPLETE	(5) NUMBER OF WORK UNITS PER WEEK	(6) MAN TOTAL HOURS PER YEAR	(7) BILLET NUMBER
152	Watches	Military duties	8	2/mo	192	9-B
153	Athletic competition	Varsity sports	1	5	260	8(1)
154	Memo-mail-etc. Routing-pickup-filing	Messenger service	.25	5	65	9
(7) 155	Shop tool-equipment inventory	Records	1	1/mo	48	8-9
156	Leave	Leave	30 days/yr/man			8-A-9
157	Meetings/conferences/liaison	Conference	1.5	5	390	9-A
158	Exams/practical factors/mil leadership	Examination	3	1/yr	3	8-9
159	Disbursing/eso/pers/admin/legal/etc.	Admin trip	.5	1	26	8-9-A
160	Medical/dental/hospital	sick call				8-9-A
161	Telephone calls		.25	5	65	9-A
162	Supervise shop pers/inspect/assign work	Supervisor	3	5	780	9-A
163	Apra Harbor NTCC travel mileage one way 10 miles	Trip	.5 RT	5 PM 1 MN 2 CM 1 MN	182	A-B-C
164	NavCommSta bldg 112 travel mileage one way 17.5 miles	Trip	1 RT	2 1 MN	102	1-A-B-C
165	NAS NTCC travel mileage one way 10 miles	Trip	.5 RT	2 1 MN	52	1-A-B-C
166	On call watch travel from quarter to site approx one way mileage 10 miles	Trip	.5 RT	5.1 1 MN	137	1-A-B-C
(7) 167	Cleaning of spaces .5 hrs	Cleaning	1.5	5 3 MN	78	A-B-C
(7) 168	General record keeping 2 hr/day	Record keeping	2	10 1 MN	540	1-B

A-51

DIV 65-1

IV-3

TABLE V CURRENT SUPPORT MANPOWER REQUIREMENT

SITE LOCATION: NCS GUAM FUNCTION: ELECTRONICS/PLANS DEPT 12 MONTH PERIOD COVERED: From 1 OCT 73 To 30 SEP 74

(1) JOB	(2) DESCRIPTION	(3) WORK UNIT	(4) MAN HOURS TO COMPLETE	(5) NUMBER OF WORK UNITS PER WEEK	(6) MAN TOTAL/HOURS PER YEAR	(7) BILLET NUMBER
(7) 169	Supply admin 1 hr/day	Admin	1	5 1 MN	270	B
(7) 170	3 Mm record admin 1 hr/day	3M admin	1	5 1 MN	270	1
171	Division career counselor 1 hr/wk	Counselling	1	1 1 MN	52	1
172	Operating training 1 hr/wk	Training	1	1 1 MN	52	1-A-B-C
173	Medical/dental 1 hr/wk	Sick call	1	1 1 MN	52	1-A-B-C
174	Advancement exams 3 hr/yr	Exams	3	4/yr	12	1-A-B-C
(7) 175	Captains inspections 2 hr/mo/6 pers	Inspection	2	1/mo	144	1-A-B-C
176	Military watches 8 hr/watch	Watches	8	12/mo	1152	1-A-B-C
177	Contractor installation assistance 1hr	Assistance	1	1 1 MN	52	1-A-B-C
178	Annual leave	Leave	30 day/yr	6/yr	1 MN 180 day/yr	1-A-B-C
179	Medical/dental times inclusive of travel frcm NAS to NCS	Sick call	0.5	1.0	26.0	1/21/A/B/C/D
180	Advancement exams	Exams	4.0	0.1	20.8	1/21/A/B/C/D
181	Supervisory meetings	Meetings	1.0	5.0	260.0	1
182	Weekly supply update	Supply	3.0	1.0	156.0	A/B/C/D
183	Update PMS weekly	PMS	2.0	1.0	104.0	A/B/C/D
184	Clean up (Empty trash, sweep shop)	Cleanup	0.4	5.0	104.0	A/B/C/D
185	Travel to TSC, VQ-1	Trip (1 Mi R.T.)	0.4	5.0	104.0	21/A/B/C/D

IV-3

TABLE 5: CURRENT SUPPORT MANPOWER REQUIREMENT

SITE LOCATION: NCS GUAM FUNCTION: ELECTRONICS/PLANS DEPT 12 MONTH PERIOD COVERED: From 1 OCT 73 To 30 SEP 74

(1) JOB	(2) DESCRIPTION	(3) WORK UNIT	(4) MAN HOURS TO COMPLETE	(5) NUMBER OF WORK UNITS PER WEEK	(6) MAN TOTAL HOURS PER YEAR	(7) BILLET NUMBER
186	Travel to NavCommSta	Trip (25 Mi. R.T.)	1.0	5.0	260.0	21/A/B/C/D
(?) 187	Travel to naval station	Trip (35 Mi. R.T.)	2.0	0.2	10.4	21/A/B/C/D
188	Records maintenance	Clerical	3.0	2.0	312.0	21/A/B/C/D
189	Quarters for muster, inspec.	Quarters	1.5	5.0	390.0	21/A/B/C/D
190	Captains inspection	Inspection	2.0	3.0	312.0	21/A/B/C/D
191	Annual leave	Leave			30 days/yr/man	1/21/A/B/C/D
192	Military watches	Watches	8.0	0.5	208.0	1/21/A/B/C/D
193	Field day	cleaning	4.0	1.0	208.0	A/B/C/D
194	Pub maintenance	Pubs	1.0	1.0	52.0	A/B/C/D
(?) 195	Football	Varsity sports			160.0	C
196	Inventory test equipment	Inventory	1.0	1.0	52.0	A/B/C/D
197	Training GMT	Training	1.0	5.0	260.0	1/21/A/B/C/D
198	Evaluations/man hour	Reports	2.0	1.0	104.0	1/21
199	Supervisory	Supervision	5.0	5.0	1300.0	1
200	Contractor assistance	Assistance	1.0	1.0	52.0	1/21
201	Base Sec patrol collateral duties	Duties	2.0	2.0	208.0	A

IV-3

TABLE V CURRENT SUPPORT MANPOWER REQUIREMENT (Includes transportation requirements)

SITE LOCATION: NCS NORFOLK FUNCTION: ELECTRONICS MAINT. DIV. 12 MONTH PERIOD COVERED: From JAN 74 To JAN 75

(1) JOB	(2) DESCRIPTION	(3) WORK UNIT	(4) MAN HOURS TO COMPLETE	(5) NUMBER OF WORK UNITS PER WEEK	(6) MAN TOTAL HOURS PER YEAR	(7) BILLET NUMBER
1	Driver transmitter site - 1 - AN/UGC-6; 1 - AN/UGC-6A	Round trip (76 mi)	2	12 PMS/yr (2) 36 COR/yr (1)	48 72	
2	Northwest receiver site - 4 AN/UGC-20; 2 AN/UGC-6; 1 TT-176A; 1 TT-187C;	Round trip (70 mi)	2	12 PMS/yr (1) 3 COR/yr (1)	24 6	
	1 TT-393; 1 AY 469; 3 TT-47A; 1 TT-47C; 1 TT 47D					
(?) 3	NAVCOMP 140, Newport News, Va. 2 AN/UGC-6 low level; 1 TT-171 low lev	Round trip (50 mi)	2	2 PMS/yr (1) 3 COR/yr (1)	24 6	
4	NSC Norva, bldg 143; 3 AN/UGC-49	Round trip (2 mi)	.50	12 PMS/yr (1) 4 COR/yr (1)	6 2	
5	Pier 3 NSC; 1 TT-171	Round trip (2 mi)	.50	12 PMS/yr (1) 4 COR/yr (1)	6 2	
6	Tower - 1 TT-171	Round trip (2 mi)	.50	12 PMS/yr (1) 4 COR/yr (1)	6 2	
7	NISRA Norva, bldg N-26 - 2 ASR-35	Round trip (1 way - across st)	.0833	2 PMS/yr (1) 12 COR/yr (1)	.2 1	
8	Norva NAVSHIPYD Portsmouth - 1 ASR-35	Round trip (32 mi)	1.5	2 PMS/yr (1) 12 COR/yr (1)	3 18	
9	NAVPHIBASE Little Creek - 1 ASR-35	Round trip (24 mi)	1.5	2 PMS/yr (1) 12 COR/yr (1)	3 18	
10	NTCC Portsmouth - 6 AN/UGC-6 low level)	Round trip (32 mi)	1.5	12 PMS/yr (2) 60 COR/yr (1)	36 90	
11	NTCC Little Creek - 4 TT-47 low level 6 AN/UGC-6 low lev;	Round trip (24 mi)	1.5	12 PMS/yr (2) 40 COR/yr (1)	36 60	
12	SP-65 NTCC Breezy Point - 10 AN/UGC-6 low level; 2 AN/UGR-9; 1 TT-47 low lev	Round trip (2 mi)	.3	12 PMS/yr (2) 208 COR/yr (1)	7.2 62.4	
13	Fleet Weather Center NAS Norva - 1 AN/UGC-47; 1 AN/UGC-49; 1 AN/UGC-77;	Round trip (2 mi)	.2	12 PMS/yr (2) 104 COR/yr (1)	4.8 20.8	
	4 AN/UGR-10; 1 AN/UGR-9; 1 AN/UGT-5					
14	MAC terminal NAS Norva - 1 TT-47; 1 TT-253 2 AN/UGC-6;	Round trip (8 mi)	.5	12 PMS/yr (1) 52 COR/yr (1)	6 26	

IV-3

TABLE 7: CURRENT SUPPORT MANPOWER REQUIREMENT (Includes Transportation Requirements)

SITE LOCATION: NCS NORFOLK FUNCTION: ELECTRONICS MAINT. DIV. 12 MONTH PERIOD COVERED: From JAN 74 To JAN 75

(1) JOB	(2) DESCRIPTION	(3) WORK UNIT	(4) MANHOURS TO COMPLETE	(5) NUMBER OF WORK UNITS PER WEEK	(6) MAN TOTAL HOURS PER YEAR	(7) BILLET NUMBER
	ELECTRONICS & CRYPTO					
(?) 15	No-break and security checks (for emergency diesel backup system for critical	Check power and oil levels, oil temper.	.5	133	3458	
	equipment and lights at bldg M-51)	Makes tour of parking lot around bldg.				
(?) 16	Wiring cable vault	Changing main frame wiring	16	5	832	
(?) 17	Field days	Clean shop area	.5	5	300	
(?) 18	Working parties	Burn runs clean out old eqpt for salvage and reissue.	.5	5	300	
(?) 19	Record keeping	Making rpts down eqpt	1	5	100	
(?) 20	Reordering stock parts	Upkeep of spares Reorder parts	2	5	150	
(?) 21	Installation and removals	Renovate equipment Install new equip	10	5	4000	
(?) 22	Mail routing	Guard mail; personnel mail; command info mi	1	5	75	
(?) 23	Letter typing		4	5	200	
24	Pubs check	Page inventory of classified pubs	3	1/mo	36	
(?) 25	Equipment inventory	Station inventory CommSta inventory	8/day	5	800	
	TELETYPE REPAIR SHOP					
(?) 26	Field days	Clean shop	1	7	300	
(?) 27	Working parties	Same as 18	1	5	50	
(?) 28	Record keeping	Same as 19	2	5	100	
(?) 29	Upkeep of parts	Same as 20	2	5	100	

IV-3

TABLE V CURRENT SUPPORT MANPOWER REQUIREMENT (Includes Transportation Requirements)

SITE LOCATION: NCS NORFOLK **FUNCTION:** ELECTRONICS MAINT. DIV. **12 MONTH PERIOD COVERED:** From JAN 74 To JAN 75

(1) JOB	(2) DESCRIPTION	(3) WORK UNIT	(4) HOURS TO COMPLETE	(5) NUMBER OF WORK UNITS PER WEEK	(6) TOTAL HOURS PER YEAR	(7) BILLET NUMBER
	TEST EQUIPMENT BRANCH					
(?) 30	Packing and shipping	Boxing and packing equipment for shipping	1	2	200	
(?) 31	Field days	Same as 26	1	4	150	
(?) 32	Record keeping	Same as 19	2	5	100	
33	Transportation of equipment	Varies too much per quarter			100	
(?) 34	Working parties	Same as 18	2	5	100	
(?) 35	Sugar Grove, W. Va.	Calibrate test eqpmt & repair - RT 850 mi	20			
(?) 36	NavRadSta, Annapolis, Md.	Same as above RT 700 mi	18			
(?) 37	NavSecGroup, Northwest	Same as above RT 70 mi	2			
(?) 38	NavSecGroup, Sugar Grove, W. Va.	Same as above RT 850 mi				
(?) 39	NCS Norfolk, Va. M51	Same as above Short walk				
(?) 40	SpecCommDiv, Northwest, Va.	Same as above RT 70 mi	2			
(?) 41	SatCommDiv, Northwest, Va.	Same as above RT 70 mi	2			
(?) 42	SatCommGTMO, Cuba	Same as above Items sent by air	?			
43	ATCU-5 (M-52)	Calibrate test eqpmt & repair crypto	Varies in a quarter		200	
44	ATCU-11 (M-52)	Same as above			200	
(?) 45	CinCLantFlt NorVa (NH-95)	Calibrate test eqpmt	5	4/yr	100	
(?) 46	NISRA, Little Creek (ASR-35)	Repair TTY	2 to 5	2 to 3/yr	10	
(?) 47	NISRA, Portsmouth (ASR-35)	Repair TTY	2 to 5	2 to 3/yr	10	

ABLE IV-3 CURRENT SUPPORT MANPOWER REQUIREMENT

SITE LOCATION: Italy FUNCTION: Consolidated Maintenance 12 MONTH PERIOD COVERED: From 1-74 To 12-74

(1) JOB	(2) DESCRIPTION	(3) WORK UNIT	(4) MAN HOURS TO COMPLETE	(5) NUMBER OF WORK UNITS PER WEEK	(6) MAN TOTAL HOURS PER YEAR	(7) BILLET NUMBER
	Consolidated Maintenance					
1. No-break Checks	Hourly readings on no-break equipment		.165	123	1051	
2. Cleaning	Routine cleaning done at 1600 and	usually done by 2-3	.5	14	364	
	2215 during week days, 1415 and 2215	men-time in column 6				
	during Sat. Sun. and holidays consists	is total hours-time				
	of straightening up of equipment, tools,	in column 4 is man				
	sweep, swab and buff floor.	hours				
3.Field Day	Cleaning of ET spaces done at 0400	usually done by 4-5	2	8	832	
	(approx) each morning and during day	men time in column 6				
	on Thursdays-same as cleaning above but	is total hours-time				
	includes dusting shop racks and waxing	in column 4 is man				
	floors.	hours				
4. Driving	Misc. Driving	Driving	various	varies	348	
5. Driving	Driving associated with Maint. per-	Driving	various	varies	360	
	formed at remote sites					

TABLE IV-3 CURRENT SUPPORT MANPOWER REQUIREMENT

SITE LOCATION: Italy FUNCTION: Consolidated Maintenance 12 MONTH PERIOD COVERED: From 1-74 To 12-74

(1) JOB	(2) DESCRIPTION	(3) WORK UNIT	(4) MAN HOURS TO COMPLETE	(5) NUMBER OF WORK UNITS PER WEEK	(6) MAN TOTAL HOURS PER YEAR	(7) BILLET NUMBER
6. Security Watch	Watch over Italian Workers	Escort Workers	various	5	2900	
7.	Moving Equipment		various	various	100	
8.	Misc Support Maint.		various	various	822	
9. Admin	Processing of Trouble Reports		.08		169	
10. Admin	Processing of 2k's		.25		110	
11. Admin	Personnel Inspection		2.0		180	
12. Admin	Publication Checks		.08		91	

BILLET DESCRIPTIONS PROVIDED BY ELECTRONICS MAINTENANCE DIVISIONS

HONO W33

BILLET

A -- communications department electronics maintenance officer (W33). Responsible for management and coordinating the workload of the Electronics Maintenance Division.

B -- admin/training/3-M assistant. Responsible for assisting the division LCPO and the electronics maintenance officer with administrative duties, maintenance of division training records and supervision of the division 3-M system.

C and 24 -- comprise the field microwave assistance team (FMAT). The FMAT accomplishes routine preventive and corrective maintenance on all Navy-owned microwave links on the island of Oahu. They are assisted in their duties by the respective site personnel (that is, transmitter site, CinCPac, etc.).

D -- digital subscriber terminal equipment (DSTE) repair. Responsible for preventive and corrective maintenance on two AN/FYA-71(V) DSTE terminals. One technician is assigned to each watch section.

E -- test equipment chief petty officer. Responsible for supervising the NavCommSta Honolulu test equipment repair and calibration facility. Supervises 6 electronics technicians and 2 civilian instrument mechanics as well as performing repair and calibration of test equipment. Maintains the command automated test equipment recall schedule.

F -- teletype repair supervisor. Responsible for supervising the communications department teletype repair facility which is comprised of 3 Navy teletype repairmen and 10 WG-11 civilian teletype mechanics. Maintains a preexpended bin system of repair parts and supervises the teletype repair facility 3-M system.

H -- special projects chief petty officer. Responsible for providing liaison between NavSeeaPac and station forces relative to all electronic installation/removal projects. Ensures all installations are completed in accordance with current installation criteria. Supervises all station forces installation projects ensuring the use of proper installation practices.

H, 19, and 28 -- a one-time expenditure of 528 MHRS (documented on table 3) was required for the low-level conversion of 33 TSEC/KW-26 crypto equipments relative to the ComNavTelCom CSE reconfiguration project.

14(2) -- a one-time expenditure of approximately 1,000 MHRS (not documented on tables 2-5) was required to write/review/rewrite the command test equipment calibration recall program.

E and 14(7) -- a one-time expenditure of 1,500 MHRS was required to relocate the test equipment repair and calibration facility to its present location (bldg 79) and renovating the new facility.

19(1) -- special projects assistant responsible for assisting NavSeeaPac and station forces on installation and/or removal of electronics equipment relative to ComNavTelCom projects. Estimate 1,500 MHRS expended.

GUAM

DIVISION 62

BILLET

Maintenance officer performs tasks 1, 2, 3, 4, 5, 8, 10, 11, 12, 14, 15, 16, 17, 18, 19, 20, 21, 24, 27, 29, 30, 31, 35, 41, 49, 50, 51, and 39.

1 -- does not perform tasks 6, 9, and 13. Does 27, 29, and 30.

5 -- performs tasks 6, 9, and 13. Does not perform tasks 65, 66, 68, and 69.

DIVISION 62-A

BILLET

34 -- does not perform task number 232.

35 -- does not perform task number 240.

36 -- does not perform task number 256 and 259. He low levels high level teletype equipment. He installs new or reconditioned teletype equipment.

7 -- in addition to task numbers 73 through 77 he:

- Stocks all incoming teletype parts.

- Orders teletype spare parts.

- Inventories all available teletype spare parts.

- Prepares servmart requisitions.

- Originates tracer actions on parts not received that are urgently needed.

- Obtains materials that are not normally carried by the Navy's supply system.

- Maintains card index system on all teletype spare parts carried by this shop and determines "high use" items.

DIVISION 62-B

BILLET

Microwave maintenance CPO -- performs all of the tasks for master billet 21 with the exception of tasks 148 and 151. In addition he performs the following tasks which are not listed as part of that billet: 6, 7, 8, 9, 14, 17, 24, 27, 37, 52, and 62.

Microwave technician -- performs all of the tasks for master billet 24 with the exception of tasks 178 and 179. In addition he performs the following tasks which are not listed as part of that billet: 23, 52, 60, 72, 74, 75,76,79,86, 92, 105, 125, 126, 127, 128, 148, 152, and 159. In addition to these tasks he works on the AM-3007/URT, T-827D/URT (both are part of the AN/WRC-1), the C-2351/FRC which is the remote unit for the AN/FRC-59.

Microwave technician -- performs all of the tasks listed in note 2 above and in addition performs supervisory tasks 143, 144, 145, 146, and 147 as the shop leading petty officer.

DIVISION 62-C

BILLET

21 -- also fills all functions of billet 27 and performs tasks 7, 8, 9, 10, 11, 12, 13, 16, 17, 20, 21, 22, 23, 30, 32, 34, 44, 50, 52, 56, 58, 63, 77, 193, 195, 196, 199, 200, 202, 204, 205, 206, and others as assigned by the division CPO. Does not perform task 181.

Shop supervisor -- performs all tasks of billet 21 in his absence, and tasks 182, 184, 194, 198, 207, 208, 209, 214, 215 and others as assigned by shop LPO or above. Does not perform task 195.

23 -- performs tasks 145, 148, 152, 159, 178 and others as assigned by supervisors. Does not perform tasks 163, 164, 167, 170, 172, 173 and 174.

28 -- performs tasks 186, 196, 197, 202, 207, 208 and others as assigned by his supervisors.

29 -- performs tasks assigned his billet, except 184. Also performs 196, 197, 202, 204, 207, 208, 209, 210 and others as assigned by his supervisors.

31 -- performs tasks 189, 192, 197, 202, 207, 208, 209 and others as assigned by supervisors.

32 -- performs tasks assigned his billet except 198, 200, 201, 203, and 212. In addition, performs tasks depending on NEC: 182 184, 185, 189, 192, 194, 214, 215 and others as assigned by billets A or 21.

33 -- depending on NEC, performs tasks 181, 182, 184, 185, 189, 192, 193, 195, 197, 199, 202, 204, 206, 207, 208, 209, 213, 214, 215 and others as assigned by supervisors.

Wiring supervisor performs tasks 80, 82, 84, 85, 86, 90, 127, 137, 138, 142, 144, 159, 209 and supervises the maintenance of all wiring and wiring records.

18 -- performs tasks assigned the billet and others as assigned by supervisors.

KW-26 technician -- performs tasks 193, 195, 196, 197, 207, 208, 209 and others as assigned by supervisors.

DIVISION 62-D

BILLET

9 -- performs tasks 1, 3, 7, 10, 13, 20, 24, 45, 56, 57, 63, 64, and 70.

3 -- performs task 11 and the tasks of billets 15, 17, 18, and 19.

8 -- does not perform task 78.

18 and 19 -- also performs tasks of billets 15 and 17, and task 11.

Wiring technician -- performs tasks 137, 138, and 139; does not perform tasks 132-136.

DIVISION 62-E

BILLET

Test equipment supervisor -- performs tasks 78, 79, 80, 86, 88 and maintains MEASURE reports and billet 8 functions.

9 -- does not perform task 85. Maintains MEASURE reports and billet 8 functions.

8 -- performs task 79 and phase A1 calibration.

DIVISION 65-1

BILLET

1 -- performs tasks 2-26, 50, 56, 57, 61, 73, 77, 3M work supervisor, division career counselor, and is filling the TSEC/KG-13 technician NEC requirement.

Crypto, DSTE, and weather equipment technician in 65-2 -- performs tasks 79, 85, 86, 91, 101, 110, 125, 126, 127, 130, 140, 162, PM/CM on VFTG system, AN/WRC-1 system, mode 5 (C-7050A/G) system, 3 DSTE system, a weather facsimile system, and associated equipment. The crypto technician also performs tasks 184, 214, 215, and 216 (TSEC/KW-7 technician). The DSTE technician (ETI) also performs tasks 25, 32, 36, 38, 39, 45, 50, 56, 58, 61, 67, 72, 73, 77 (functions as LPO), and the ET-2 does 72-76 (division supply PO).

DIVISION 65-2

BILLET

1 -- performs all tasks except 6, 9, 15, and 23.

21 -- performs all tasks except 151. He also performs tasks 32, 35, 36, 45, 49, 50, 53, 56, 72, 81, 96, 110, 125, 130, 169, 192, and PM/CM on CV2460, KY655, and DSTE.

(ET1)
DSTE technician -- performs tasks 81, 85, 88, 90, 96, 125, 169, and PM/CM on CV 2460, KY655, and DSTE.

DSTE technician (ETN2) -- performs tasks 85, 88, 90, 91, 96, 125, 130, 140, 169, and PM/CM on CV2460, KY655, and DSTE.

KY-3 technician -- performs tasks 79, 85, 91, 96, 124, 130, 140, 169, 187, and PM/CM on CV2460, KY655, DSTE, and KY-3.

KY-7 technician -- performs tasks 79, 85, 91, 96, 124, 130, 140, 169, 184, 214, and PM/CM on CV2460, KY655, and DSTE.

TABLE IV-4

TRAVEL SCHEDULE--NORFOLK TO REMOTE SITES

This summarizes travel to outside maintenance activities by TTY shop personnel, with one-way mileage (man-hours are transportation time only).

		Number
Driver transmitter site 2 hours round trip Mileage 1 way--38 miles 12 PMS trips per year--2 men (48 man-hours)	AN/UGC-6 AN/UGC-6A 36 CM trips per year--1man (72 man-hours)	1 each 1 each
Northwest receiver site 2 hours round trip Mileage 1 way--35 miles 12 PMS trips per year--1 man (24 man-hours)	AN/UCC-20 AN/UGC-6 TT-176A TT-187C TT-393 KY-469 TT-47A TT-47C TT-47D 3 CM trips per year--1man (72 man-hours)	4 each 2 each 1 each 1 each 1 each 1 each 3 each 1 each 1 each
NavComp 140 Supvr. shipbuilding, Newport News, Va. 2 hours round trip Mileage 1 way--25 miles 2 PMS trips per year--1 man (24 man-hours)	AN/UGC-6 low level TT-171 low level 3 CM trips per year--1 man (72 man-hours)	2 each 1 each
NSC Norva Bldg. 143 0.5 hour round trip Mileage 1 way--1 mile 12 PMS trips per year--1 man (6 man-hours)	AN/UGC-49 4 CM trips per year--1 man (24 man-hours)	3 each
Pier 3 0.5 hour round trip Mileage 1 way--1 mile 12 PMS trips per year--1 man (6 man-hours)	TT-171 4 CM trips per year--1 man (12 man-hours)	1 each
Tower 0.5 hour round trip Mileage 1 way--1 mile 12 PMS trips per year--1 man (6 man-hours)	TT-171 4 CM trips per year--1 man (12 man-hours)	1 each
Nisra Norva bldg. N-26 Mileage 1 way--across street 2 PMS trips per year	ASR-35 12 CM trips per year	2 each

TABLE IV-4 (CONT'D)

Norva Navshipyd Portsmouth 1.5 hours round trip Mileage 1 way--16 miles 2 PMS trips per year--1 man (3 man-hours)	ASR-35 12 CM trips per year--1 man (18 man-hours)	1 each
NavPhiBase Little Creek 1.5 hours round trip Mileage 1 way--12 miles 2 PMS trips per year--1 man (3 man-hours)	ASR-35 12 CM trips per year--1 man (18 man-hours)	1 each
NTCC Portsmouth 1.5 hours round trip Mileage 1 way--16 miles 12 PMS trips per year--2 men (36 man-hours)	AN/UGC-6 low level 60 CM trips per year--1 man (90 man-hours)	6 each
NTCC Little Creek 1.5 hours round trip Mileage 1 way--12 miles 12 PMS trips per year--2 men (36 man-hours)	AN/UGC-6 low level TT-47 low level 40 CM trips per year--1 man (60 man-hours)	6 each 4 each
SP-65 NTCC Breezy Point 0.3 hour round trip Mileage 1 way--2 miles 12 PMS trips per year--2 men (7.2 man-hours)	AN/UGC-6 low level AN/UGR-9 TT-47 low level 4 CM trips per week--1 man (62.4 man-hours per year)	10 each 2 each 1 each
Fleet Weather Center NAS Norva 0.2 hour round trip Mileage 1 way--1 mile 12 PMS trips per year--2 men (4.8 man-hours)	AN/UGC-47 AN/UGC-49 AN/UGC-77 AN/UGR-10 AN/UGR-9 AN/UGT-5 2 CM trips per week--1 man (20.8 man-hours per year)	1 each 6 each 1 each 4 each 1 each 1 each
MAC terminal NAS Norva 0.5 hour round trip Mileage 1 way--4 miles 12 PMS trips per year--1 man (6 man-hours)	AN/UGC-6 TT-47 TT-253 1 CM trip per week-1 amn (26 man-hours per year)	2 each 1 each 1 each

TABLE IV-5

SUPERVISORY OVERHEAD RATES

	Hono CM	Hono W33	Guam[a]	Norfolk	Italy
Total site overhead	15.9	12.7	22.3	29.0	33.3
Watch maintenance overhead	2.5	3.8	-	16.5	13.6
Total maintenance overhead	9.5	7.0	22.4	24.7	12.5
General management overhead	4.1	5.6	5.1	8.6	20.8

[a]Based on extrapolated data.

TABLE V-1

MANPOWER REQUIREMENTS OF MAINTENANCE PERSONNEL

Man-hours required

	Hono CM	Hono W33	Guam	Norfolk	Italy
Maintenance					
PM					
Site req	14,617	34,004	37,568	39,348	12,793
Navy req	21,286	47,342	53,059	57,841	18,808
CM					
Site req	2,861	16,332	13,229	38,067	11,065
Navy req	21,286	47,342	53,059	57,841	18,808
Total					
Site req	17,478	50,337	50,797	77,414	23,859
Navy req	42,572	49,684	106,118	115,682	37,617
Support					
O&M direct labor	23,932	18,025	71,110	11,939	6,964
+17% PF+D	4,068	3,064	12,089	2,030	1,184
Total	28,000	21,089	83,199	13,969	8,148
Total					
Site req	45,478	71,426	133,995	91,383	32,007
Nav req	70,572	115,773	189,317	129,650	45,765

Direct labor full-time equivalent
Required/on hand

Maintenance					
Total					
Site req	10.5/47.6	30.3/71	30.6/74.5	46.6/42.5	14.4/24
Navy req	25.6/47.6	57.0/71	63.9/74.5	69.6/42.5	22.6/24
(Incl. supvr's)	/52.1	/76	/91	/53	/27
Support					
Total	16.9/	12.7/	50.1/	8.4/	4.9/
Total					
Site req	27.4/47.6	43.0/71	80.7/74.5	55.0/42.5	19.3/24
Navy req	42.5/47.6	69.7/71	114.0/74.5	78.1/42.5	27.6/24
(Incl. supvr's)	/52.1	/76	/91	/53	/27

TABLE V-2

UTILIZATION OF MAINTENANCE PERSONNEL

		Hono CM	Hono W33	Guam	Norfolk	Italy
Maintenance						
Site req	- Direct-labor only	0.22	0.43	0.41	1.10	0.60
	- Incl. supvr's	0.20	0.40	0.34	0.88	0.53
Navy req	- Direct-labor only	0.53	0.80	0.86	1.64	0.94
	- Incl. supvr's	0.49	0.75	0.70	1.31	0.84
Support						
(of direct-labor personnel)		0.36	0.18	0.67	0.19	0.20
Total (Incl. coll. support)						
Site req	- Direct-labor only	0.58	0.61	1.08	1.29	0.80
	- Incl. supvr's	0.53	0.57	0.89	1.04	0.71
Navy req	- Direct-labor only	0.89	0.98	1.53	1.84	1.15
	- Incl. supvr's	0.82	0.92	1.25	1.47	1.02

End 12-75