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Subject: Engineering Report, Staging Operations Summary

1. PURPOSE

- 1.1 The intent of this Engineering Report is to review and outline recommendations for improving the support of staging operations. Planning factors are based upon enclosures 1 through 8 and consist of the following listed topics which are discussed and summarized herein:

Para. 2.1 Basic Assumptions.
Para. 2.2 Operational Concepts
Para. 2.3 Personnel Requirements
Para. 2.4 Improved Maintenance Policies
Para. 2.5 Equipment Handling Techniques
Para. 2.6 Ground Support Equipment & Facilities
Para. 2.7 Mobility Plans.
Para. 2.8 UME - FAK - Supplementary Supply Lists
Para. 2.9 Pre-Placed Support

2. GENERAL DISCUSSION

- 2.1 Basic Assumptions.

The following assumptions are in accordance with those outlined in a meeting with Headquarters and contractor personnel at July 29, 1957. STAT

- 2.1.1 One A/C deployed not to exceed thirty (30) days.
2.1.2 A/C to be flown to staging area.
2.1.3 Four (4) sorties of eight (8) hour duration.
2.1.4 Pre-Specified Configurations of A-2, B, C and Tracker to be utilized.

- 2.2 Operational Concepts.

- 2.2.1 Configurations deployed will have undergone all major inspections and modifications and will have remaining service life within specifications.
2.2.2 Maintenance will be limited to the replacement of major components only.
2.2.3 Test and ground support equipment will consist of only those items necessary for pre-post flight shop and flight line testing.
2.2.4 Installation and removal of configurations will be accomplished within a hangar or a dust controlled shelter.

2.2. Operational Concepts, cont'd.

- 2.2.5 Film processing will be limited to film clips only. No water purification or temperature control will be necessary. Processing of 70mm negative will be accomplished where directed by Operations section, and supplementary equipment provided.
- 2.2.6 Shop and darkroom areas will be dust controlled, with provisions for heating and/or cooling. De-humidifiers will be utilized where necessary.
- 2.2.7 Installation shelters. Should hangar space be unavailable for accomplishing configuration installation and removal, a substitute shelter capable of protection from the elements, with temperature and dust control will be required. Such an item is presently being evaluated by CWO Moberley at Maywood for this purpose. Enclosure 8 is an abstract from the specifications covering this "Maintenance Tent". The proposed shelter appears to be adequate for the purpose required.
- 2.2.8 The use of Standard USAF Photographic Trailers has been investigated for use in staging operations, however due to the size and weight involvements, the decision was made at the suppliers meeting not to consider them.
- 2.2.9 Film storage space requirements are dependent upon the number and types of missions scheduled for any particular staging operation, therefore this can best be determined by the Photo Supervisor. It is imperative, however, that storage conditions be adequate as to temperature and humidity conditions and that specified controls be established prior to receipt of any film at a staging site. Excessive temperature and humidity conditions may be tolerated for short periods, however there is a possibility of jeopardizing the success of a mission in doing so. The Film Manufacturer recommends film storage at 68° F or less, with relative humidity between 30 and 40 percent.
- 2.2.10 Processing chemicals. To reduce the amount of equipment necessary in mixing developer and hypo it is recommended that the use of pre-mixed concentrates be available for staging activities. This would greatly simplify clip and 70mm processing and would save considerable time. The feasibility of having this provided in easily transportable containers from the film manufacturer will be investigated and reported upon at a later date.

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2.3 Personnel Requirements.

- 2.3.1 To adequately support the mission rate outlined in para. 2.1.3, a team consisting of three (3) Camera Systems Field Engineers minimum would be required, i. e., a Supervisor (photo-optical), one mechanical, and one electrical field engineer. One of the three mentioned should be a qualified film processor. Should processing of 70mm results be required, one (1) additional person would be necessary. These figures are based upon an assumption that a minimum amount of facilities preparation is required and that the photo section personnel will be required only to ready equipment and arrange shop and processing areas. Should extensive carpentry, plumbing, electrical wiring, etc. be required, an advance work party should be arranged.
- 2.3.2 For expanded staging activities involving support of additional A/C and increased sortie rates, supplementary personnel required will depend upon the number of configurations to be readied and the scheduling of either simultaneous or staggered take offs.
- 2.3.3 Rotation of personnel is recommended where living conditions are poor, and duration of operation exceeds 30 days.

2.4 Improved Maintenance Policies.

- 2.4.1 The photo Supervisor of a staging team will insure that the following items accompany the specified configurations to be deployed:

All Applicable Manuals (Revised)
Current File of Service Bulletins
Current File of Maintenance Orders
Applicable Blue Prints (Schematics)
Maintenance Records
General Information Notebooks
All Forms Required:
 Pre-Post Flight
 Mission Records
 Mission Engr. Reports
UME & FAK Supply Lists
Detach ment SOPs
Current Chit-Chat, TWX and Correspondence Files
 pertaining to maintenance.

- 2.4.2 All periodic, preventative and post flight maintenance will be accomplished in accordance with the methods and procedures as outlined in references paragraph 2.4.1.

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2.5 Equipment Handling Techniques.

2.5.1 For handling of configuration shipping containers, film boxes, tote benches and other heavy packaged items, it is desirable to utilize a fork lift. In lieu of or in addition to this transport dollies and lifting hoists are required. These items are useful as general support to all sections for loading and unloading the transport aircraft. Transport dollies are a UME item, however there are no "A" frame structures included to support a hoist. Such an item was fabricated and delivered to the project as part of the installation shelter and is currently available for use at the Test Site. Should this item be determined suitable with the presently proposed shelter, steps should be taken to make same available for staging operations. (See Enclosure II)

2.5.2 Present A/C equipment installation hoist is adequate.

2.6 Ground Support Equipment and Facilities.

2.6.1 Enclosure 12 lists those items of UME which are recommended for use in supporting any A-2 or B staging operation. UME for C Configuration will be added at a later date. Supplementary items will be required depending upon the number and types of configurations to be used, number of personnel, mission rate, geographical location, adequacy of base facilities, length of stay, availability of supplies from home base, and extent of processing requirements. These requirements will be determined by the Photo Supervisor prior to deploying.

2.6.2 With few exceptions, present ground support equipment within the Detachments is adequate in design and quantity to support the majority of staging operations.

2.6.3 Battery Power Cart (Ref. Enc. I, Para. 2-1)

A major problem encountered by all Detachments in prior staging operations was in air transporting the Battery Power cart. A.F. regulations prohibit airlifting as cargo wet storage batteries, thus necessitating drainage of all electrolyte prior to movement. Unavailability of replacement electrolyte and charging facilities at most of the staging sites resulted in time loss and inconvenience of obtaining substitute power sources. It is recommended that the two 16 volt batteries be replaced with a 28 v. d. c. rectifier unit operable from a 115 v. 60 cycle single phase source which is always available. Feasibility of this is currently being investigated, and a change proposal covering work and costs will be submitted.

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2.6 Ground Support Equipment and Facilities, cont'd.

- 2.6.4 Darkroom facilities are required for loading and unloading magazines or cassettes and for clip processing. Adequate areas to accomplish these activities are usually unavailable at staging sites, necessitating considerable effort and time loss in establishing same. It is recommended that portable type standard USAF Darkroom Kits, types U-1, U-2 or equivalent be provided as a UME item, which could be modified for this purpose. (See Enc. 9 for specifications) It is desirable that the darkroom be of ample size to accommodate a configuration plus several "B" film boxes and sufficient working space for at least two (2) persons.
- 2.6.5 Film Processing: It is imperative that film clips be evaluated from a mission prior to rerun of the same configuration to insure greatest reliability and optimum photo quality of results. This necessitates a very limited processing capability including pre-mixed chemicals, small portable dryer (9 1/2"), and a B-5 processor. This equipment should be provided as part of the detachments authorized UME and thoroughly checked prior to staging. Use of pre-placed processing equipment provided by other support organizations should not be relied upon. (See Ref. Enc. 3, Para. 3.0)
- 2.6.6 70mm Processing equipment should be added to the UME if so directed by Headquarters Operations. Prior staging activities by "C" Detachment established this as a requirement and supplementary equipment was provided, however inadequately. Items recommended are listed in Enc. 10.

2.7 Mobility Plans.

- 2.7.1 Enclosure 14 is recommended as an outline for the preparation of a Special Equipment Section Mobility Plan. Each Detachment Supervisor should prepare such a document for planning purposes. Records should be kept of actual packing lists for each staging operation as a guide for future planning and provisioning with copies to Headquarters and the Photo Systems contractor.
- 2.7.2 Enclosures 10, 12 and 13 are to serve as a guide in establishing the UME and FAK requirements. Reusable shipping containers for these items should be readily available to the photo section and a packaging plan pre-arranged.

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2.8 UME - FAK Supplementary Supply Lists.

- 2.8.1 UME items recommended for staging operations are compiled from lists generated from prior activities. This general list will be supplemented by additional items found necessary to support specific activities involving increased sortie rates, particular locations, etc. This must be determined by the photo Supervisor prior to staging. Enclosure 12 outlines the general list of UME required.
- 2.8.2 FAK spares taken on a staging operation should be pre-selected and held to a minimum. They should be drawn and packaged by the photo section supply coordinator prior to deployment in adequate quantities to enable field maintenance only at the staging location. Complete spare configurations should be available at the site which would provide 100 percent replacement of major components, thus minimizing the maintenance efforts. Enclosure 13 outlines a general FAK list to support one each of the A-2 or B Configurations. FAK lists for "C" Configuration will be forthcoming.
- 2.8.3 Supplementary equipment and supplies will be required to enable expediency in the establishment of satisfactory facilities at staging sites. These items will greatly increase the efficiency of the photo section support and will insure mission readying on schedule with equipment of unquestionable reliability. Included in this listing are the items necessary to accomplish 70mm film processing. Also included is a list of general tools and materials found necessary for preparation of the photo section facilities at a staging site. These should be shipped with the advance party to insure complete readiness prior to arrival of basic UME. Enclosure 10 outlines these lists of general supplementary support items.

- 2.9 Pre-placed support items should include the necessary equipment for heating and cooling of shop darkroom areas, power units (115 volts, 60 cycles, 1 phase), plus lighting and plumbing fixtures. Should installation tents (Ref. Para. 2.3.7) be utilized these should be pre-placed. The U-1 or U-2 darkroom kits might also be pre-placed. Film supplies could be pre-placed if adequate storage facilities are prearranged and found suitable by the photo section Supervisor. All equipment to be provided by a support organization must be thoroughly inspected and found acceptable by the Supervisor prior to use. Considerable difficulty was encountered in this respect with prior staging activities, particularly with the film processing equipment. Enclosure 10, Group IV outlines a recommended general listing of pre-placed materials necessary for facilities preparation.

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3. RECOMMENDATIONS AND SUMMARY

- 3.1 The foregoing recommendations should receive consideration for the planning of any staging operations in the future. With few exceptions, all criteria discussed has been acted upon and the necessary changes, modifications and improvements implemented. The major area of concern still requiring action involves the acquirement of the additional support items not included in UME and FAK. A disposition list should be made covering each of these items to determine their availability within the project, if they should be provided by the contractor or locally procured overseas. A follow-up survey and report will be made at a later date regarding these items.
- 3.2 It is recommended that each Photo Supervisor utilize this report as a guide to the selection and planning of support equipment and spares to be utilized on staging operations and that the mobility plans as outlined in Para. 2.7 and Enclosure 14 be prepared at the earliest possible date.
- 3.3 It is also recommended that this report be distributed to and discussed by the Project Supply Personnel and representatives of the Photo Systems contractor in the very near future to enable proper coordination and to insure ample timing for procurement prior to the 1958 operational season.

Submitted:

STAT

Copies:

Project Headquarters (1)
Contractor, Photo Equip. (1)
Photo Supervisor, Det. B (1)
Photo Supervisor, Det. C (1)
Field Service File, Contractor (1)

ENCLOSURE /

3 December 1957

To:

STAT

From:

Subject: Interim Engineering Report, Staging Operations

- References:
- (1) Letter to "Staging Criteria, Photo Systems", dated 14 August 1957 from STAT
STAT
 - (2) Report on Staging Operations, from STAT
 dated 25 October 1957. STAT
 - (3) Mobility Plans, Special Equipment Sections, from Detachment "A", dated 15 January 1957. STAT
 - (4) Comments on Detachment "A" Activities from , dated 22 November 1957. STAT
 - (5) General Operations Overseas of Detachment "A" from dated 25 November 1957. STAT
 - (6) Staging Operation, Detachment "B" from dated 26 November 1957. STAT

1. PURPOSE

This interim report covers some of the more significant problems encountered during staging operations in the 1957 operational season and those anticipated for future activities. Areas of discussion are abstracted from the above references and represent a summation of specific problems encountered by Detachments A, B A detailed and more complete report will be forthcoming at a later date outlining proposed recommendations for 1958 staging operations, complete with personnel requirements, operational procedures, improved maintenance and installation methods, handling techniques, ground support equipment and facilities, packing and mobility plans, UME - FAK supply lists and pre-placed support.

2. GENERAL DISCUSSION

2.1. Battery Power Cart.

A Major problem encountered by all detachments pertains to the use of the battery power cart for staging operations. The prime difficulty encountered was in airlifting of filled and charged wet storage batteries as cargo, which is extremely dangerous. Air Force regulations prohibit this practice, thus necessitating drainage of all battery electrolyte prior

Subject: Interim Engineering Report, Staging Operations, cont'd.

2.1. Battery Power Cart, cont'd.

to air transporting. Unavailability of replacement electrolyte and charging facilities at most of the staging sites resulted in time loss and inconvenience of obtaining substitute power sources.

2.2. Darkroom Loading Areas.

Loading and unloading of magazines and cassettes at a staging site requires a light free area of ample space to accommodate a complete configuration, plus film shipping containers. Various makeshift areas were provided in prior operations which necessitated extensive rework before they could be utilized. Shortage of materials and time delays in preparing these areas could seriously hamper mission readying.

2.3. FAK

Spare parts taken on a staging operation should be held to a minimum and should be drawn and packaged by the Photo Section prior to moving from a home base. A complete spare configuration should be available at the site which would provide replacement major components, thus minimizing the maintenance efforts.

2.4. Clip Processing

It is imperative that clips be evaluated from a mission prior to rerun of the same configuration to insure optimum results. This necessitates a very limited processing capability including pre-mixed chemicals, small portable dryer and a B-5 film processor. This equipment should be provided by the Detachment and thoroughly checked prior to the staging operation. Use of pre-placed equipment provided by another support organization should not be relied upon.

3. RECOMMENDATIONS

3.1. Battery Power Cart.

Replacing the two 16 volt wet storage batteries with a 28 volt DC rectifier unit operable from a 115 volt 60 cycle, one-phase source (always available) would adequately provide the necessary power for pre- and postflight checking.

3.2. Darkroom Loading Area.

A portable type standard USAF darkroom kit (Types U-1, U-2, or equivalent) should be provided and modified to accommodate configuration loading and unloading operations. Processing of clips could also be accomplished within this area.

Subject: Interim Engineering Report, Staging Operations, cont'd.

3.3. FAK

A supply coordinator within the Photo Section should be designated to insure that the prelisted items of support are drawn and packaged in adequate quantities to enable field maintenance at the staging location.

3.4. Clip Processing.

The designated Photo Section film processor should be responsible for preparing a kit complete with chemicals in accordance with the recommended list of items required for limited processing and evaluation. Should 70mm processing be required by Detachment Operations Section, provisions should be made for obtaining the necessary equipment prior to staging to insure adequacy.

4. CONCLUSION

The foregoing topics should receive prompt consideration and proper action prior to any contemplated staging operations. Increased efficiency and time conservation resulting will greatly aid the success of the staging activities.

 STAT

ENCLOSURE 2

14 August 1957

STAT

Subject: Staging Criteria, Photo Systems

Dear Sir:

1. Hycon has been requested to prepare equipment and parts lists relative to the photo systems support of staging operations from a home base. Two lists, recommending the necessary GME and FAK items, were submitted to CWO W. Moberly on August 7, 1957. These were prepared in accordance with the assumptions and considerations, as outlined in a meeting with Headquarters and contractor personnel at Maywood, July 29, 1957.

2. Basic Assumptions:

One aircraft deployed not to exceed thirty (30) days. Aircraft to be flown to staging area. Four (4) sorties of eight (8) hour duration. Configurations A-2, B, C, and Tracker to be utilized.

3. Operational and Maintenance Support Concepts:

a. Configurations deployed will have undergone all major inspections and modifications, and will have remaining service life within specifications.

b. Maintenance will be limited to the replacement of major components only.

c. Test equipment will consist of only those items necessary for pre- post-flight shop and flight line testing.

d. Installation and removal of configurations will be accomplished within a hangar or a dust controlled shelter.

e. Film processing will be limited to film clips only and will require a dark-room (6 ft x 6 ft), B-5 developer and three trays. Bulk concentrates will simplify chemical mixing and solution storage. No water purification or temperature control

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If necessary:

i. A team of three (3) camera systems field engineers would be required for supporting this activity, i. e., a supervisor (photo-optical), one mechanical, and one electrical field engineer.

g. Shop space required for configuration maintenance and pre-flight testing would be approximately 300 sq ft with provisions for dust control. Hoisting facilities to accommodate 1/4 ton capacity should be available within this shop area.

h. For tracker and hatch maintenance, testing, and loading, plus storage of equipment, hatches, and configurations, an area of approximately 200 sq ft is required. This area should be capable of being blocked out for use as a film loading development for tracker.

ii. Film storage requirements are as follows:

(1) "A" material - 24 cu ft (12 rolls, plus 2 spares)

"B" material - 270 cu ft (3 rolls, plus 2 spares)

"F" material - 5 cu ft (4 rolls, plus 2 spares)

(2) Storage conditions: temperature controlled to 68 degrees F, not to exceed 75 degrees for prolonged periods. Relative humidity 30 to 40%.

(3) Access doors to storage area must be 36 inches wide with door jamb and floor suitable for operating small castored dollies.

(4) Location of film storage area should be in close proximity to the maintenance shop for loading purposes.

j. Equipment handling: for handling of configuration shipping containers, film boxes and other heavy items, it is desirable to utilize a fork lift. In lieu of this, suitable transport dollies and lifting hoists would be required. Transport dollies are presently part of Detachment IME, however, there are no "A" frame structures included to support a chain hoist. Such an item was fabricated and delivered to the project as part of the installation shelter. Further evaluation of this hoist will be made to determine its suitability with the newly proposed shelters.

4. Support equipment list of items not included in FAK and IME is as follows:

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CONFIG B

1	HS-732 Shutter	3
2	73B Cassette	2
3	73B Programmer	1
4	Tension Carve	1
5	Take-up Drive	1
6	Oblique Drive	1
7	Film Drive	1
8	Data Chamber	1
9	Valve Assy. Vacuum (incl Solenoid)	1
10	Film Spools	2

NOTE: Support requirements for Configuration "C" will be submitted at a later date.

7. The foregoing recommendations are subject to review and modification inasmuch as they reflect the opinions of in-plant personnel. It is felt that comparison should be made with recommendations forthcoming from the detachments as the operating field personnel are much closer to the day-to-day maintenance and support requirements.

Very truly yours,

HYCON MFG. COMPANY



STAT

WRSP III
PHOTO EQUIPMENT SECTION

ENCLOSURE

3

25 OCTOBER 1957

To:

STAT

From:

Subject: Report on Staging Operations

1. PURPOSE:

- A. To list equipment used on accomplished staging missions.
- B. To discuss adequacy of ground support equipment.
- C. To discuss circumstances and to make recommendations.

2. GENERAL DISCUSSION:

The known facilities and services guaranteed at the staging location, and the specific operations order for the staging effort will determine the exact equipment requirements. In planning the equipment list for any given effort, total weight of equipment to be transported is a critical factor. Only the essentials needed to handle the operation and reasonably expected maintenance emergencies should be considered. Manpower, makeshift, ingenuity and sharing equipment can minimize the equipment list to essentials. On both occasions for WRSP III, our mission was accomplished without serious handicap with the existent ground support equipment.

For the two staged missions summarized in this report:

- A. It was practical to take two configurations of the same type. This simplifies the operation. Having two operational units of the same type allows rapid turn around in the event of an abort or additional mission requirement. This also simplifies the FAK or spares support requirement, in that spares are inherent in the presence of the second configuration.
- B. Expendable FAK items were drawn before deployment and packed with the section equipment.
- C. An adequate hangar was assigned at the site. Protected space was available, suitable for storing equipment, preparing and loading the configurations. It was possible to rig dark room space for film loading and checking the configurations from facilities and materials on location.
- D. Tracker Negative was processed on both occasions. Special equipment had been forwarded from another agency, and complimentary laboratory facilities were available.

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- E. Nitrogen for purging was supplied at the site.
- F. Battery shop facilities were available.
- G. Special refrigerated space was available. It was necessary to use this facility on only one of the trips.

3. PROGRESSING:

On two staged operations, the Photo section has processed the Tracker Negative. A duplicate positive was not made. For this activity, special equipment was forwarded from another agency to the stage area. In general, this agency was unfamiliar with the exact requirements. Duplication of equipment resulted, as well as the equipment sent was not in the condition it should have been.

Detachment Operations, Intelligence, and Weather Sections are very much interested in viewing the results of the Tracker. It should not be much of an additional complication to accommodate the processing of the Tracker negative. The major additional items that would be required would be:

1. A small portable drier.
2. A developing unit similar to the B-5.
3. Large mixing tanks.
4. Temperature control for solutions.
5. Portable sink.

Several approaches or plans are probable to accommodate this requirement, and a special study of proposals is suggested. The plans would depend upon the degree of self-sufficiency required. These plans should be coordinated with plans and proposals being considered for portable Dark Rooms and housing facilities.

4. DARK ROOM FACILITIES:

For the mission that involved the A-2 and the Tracker, we utilized a 6 ft. by 6 ft. double door entry area for the dark room. A simple shelf was rigged that sufficed for loading the A-2 magazines and the Tracker. The Tracker was removed from the Hatch for loading and unloading.

For a mission that involved the B configuration, there are possible techniques for handling the loading of the cassettes and check out of the configuration that would require no more dark room space than this 6 ft. by 6 ft. area. Processing space requirements should be essentially the same.

Thus, the idea is suggested for a dark room that was convertible from loading and film handling requirements to become a processing Lab. Furthermore, the possibility of cleverly designed packing crates (that are also required) that could convert into this needed dark room, is suggested. These crates would serve to pack very nearly the entire bulk of the sections equipment. They would be approximately 6 ft. by 6 ft. by 4 ft. In the converted state this unit would serve as the work center for the section. It could be plumbed, wired and designed to conveniently accommodate essentially all of the ground support requirements.

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Removable shelves, sinks, air conditioning and dust proofing, outside bench, convenience outlets, function of the Battery and Vacuum cart, and many other functions could be integrated into this design. The concept is for a completely self sufficient, compact, and rapidly serviceable and convertible arrangement.

In the instance where the tent type portable dark rooms are considered, these should be large enough to accommodate the B configuration for dark room checkout.

5. FILM STORAGE:

Special storage areas are difficult and sometimes impossible to arrange. The film as it comes packaged appears to be relatively safe for the period of 30 days under circumstances of temperature and humidity that would not be tolerated for extended storage. High humidity of the order of 80% has been tolerated for 30 days or more with negligible effect on the B film, and no effect on the other film that is taped and canned. We suggest that high temperatures can be tolerated for short periods of time providing that the average temperature throughout is less than 75 or 80 degrees.

6. MISCELLANEOUS:

- A. Batteries for the Battery and Vacuum cart are a nuisance. These batteries have to be dried out before they can be transported. It is almost a certainty that 110 Volt AC convenience power will be available in some form or another. It is suggested that the batteries be replaced with a Rectifier unit to deliver the required 28 Volts DC.
- B. A small motorized Fork Lift would be an exceptionally useful piece of equipment as a support item for use by all sections. For a totally self-sufficient operation it would almost be considered essential to load and unload the transport aircraft. If this unit were available, the large aluminum dollies for transporting configurations and the suggested A frame and hoist could be dispensed with.

7. SCHEDULING:

- A. It can be expected that the first mission has to be prepared within the first 12 to 24 hours after arriving at the site.
- B. Preparations for processing (particularly if the Tracker negative is to be done) is arranged during the time the mission is being flown.
- C. From the time of the "Alert" for the mission to the final delivery of the "take" is approximately 24 hours of continuous activity for the crew. If the facilities have to be prepared and arranged previous to the alert, this can amount to 50 hours of continuous activity.
- D. Three men work out to be adequate for an A-2 or A-1 operation. It may be better to consider four men to handle the B. The personnel requirement depends on whether or not the Tracker negative has to be handled.

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8. PHOTO SECTION PACKING LIST:

Typical Weight - 4500 lbs., Typical Cube - 500 Cu. ft.

- A. Configurations. As directed by the Headquarters Operations Order. It is preferred to take two configurations of the same type. This allows one configuration to be prepared while the other is in flight to allow rapid turn around in the event of an abort or additional mission requirement. The second configuration represents a complete set of spares.
- B. Trackers. Two are taken. Usually one can be transported in the aircraft.
- C. Drift Sight and Hand Control. Normally only a Drift Sight spare dome, power changer motor, and power changer switch would be taken. In the case wherein the aircraft to be used does not belong to the Detachment, it is suggested that a complete spare assembly be taken. In the one instance that this occurred with us, we had a much superior system that we exchanged for the system that came in the aircraft.
- D. Film Load. Enough for four to six missions. Tracker positive has not been required.
- E. General Support Items.
 1. Photo Hatch. Usually one is carried on the aircraft.
 2. Hatch Cart. 1 each, without handle, for convenient transport.
 3. Battery and Vacuum Cart. May have to carry electrolyte.
 4. Electrical test set, complete with cables.
 5. Larsen recorder, complete with cables, paper, and ink.
 6. Lens cleaning kit.
 7. Vacuum cleaner, with spare bags.
 8. Forward bulkhead fittings - 2 sets.
 9. Rewind stand. A modified unit can be made up specially suited to the purpose of pulling clip material.
 10. Stripping spool. This is an 1800 ft. spool with one flange removed.
 11. De-humidifier unit. This is a small portable refrigeration unit, and is very helpful in the area that the B may be stored after it has been loaded.
 12. Photo technicians tool boxes. 2 each (could get by with only one)
 13. Electric drill motor, 3/8 inch - 1 each.
 14. Simpson multimeter, with test prods and leads. 1 set.
 15. Safelight.
 16. Purging fixtures and hoses. There are several different types of bottles and one should be prepared with the different adapters. The aircraft people have some types at hand.
 17. Nitrogen bottle, if none is available at site. WRSP III is running some tests to see if dry air from the portable power cart (MA-2) maybe a suitable substitute for the nitrogen.

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18. 3/8 inch socket drive set.
19. 390 ft. spools with cans. - 3 each.
20. 100 ft. spools with cans. - 3 each.
21. AC extension cord with light. - 2 each.
22. AC convenience plug in outlets. - 2 each.
23. Nails. For film shipping crates.
24. Miscellaneous assortment of selected hardware.
25. Battery operated spotlight.
26. Sling psychrometer.
27. Black out curtains. - 100 sq. ft.
28. Saw.
29. Hammer, tin snips, large screwdriver, nail puller, (stored in the drawer of the battery cart for ready access in unpacking).
30. Kimwipes - 2 boxes.
31. 2 inch armament tape - 4 rolls.
32. 2 inch masking tape - 6 rolls.
33. 1 inch splicing tape - 2 rolls.
34. Pre-post check lists, maintenance forms, applicable tech manuals and maintenance instructions, applicable schematics (electrical), FAK list, De-briefing forms, magazine data forms, Film can ID stickers, envelopes, typewriter paper, tablets, clip board, colored pencils, regular pencils, stapler with box of staples, test clip envelopes, personal notebooks, marking pen (ink), carbon paper, applicable SOP's and directives.
35. 732 Magazine key wrench, 2 each for A-2.
36. Scissors.
37. Razor blades.
38. Set of drills.
39. Assorted Tru-arc pliers.
40. Oilers.
41. Assorted hook up wire.
42. Flashlight batteries and bulbs.
43. Spintite wrench set.
44. Clevis for slings, 2 each.
45. Pandux tem recorder with charts.
46. Low tem grease, MIL G 15793.
47. Lube Oil Mil L 2105.
48. Pip pins.
49. Black, spray can paint, 2 cans.
50. Solder.
51. Glyptal.
52. Template for making aperture plates.
53. Scotch tape and holder.
54. Cling oil.
55. Rubber mat for magazine loading. A-2
56. Coffee pot, coffee, cream, sugar, cups, spoon.
57. Survival kit items.

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58. 20 gal KD-20.
 59. 10 gal D-19.
 60. B-5 processing tanks, 3 each.
 61. Hypo (FAK took for us) 20 gal.
 62. Timer clock.
 63. Thermometer.
 64. Towels, 4 each.
 65. Steel tracker film spools, 3 ea. (for spooling processed tracker film).
 66. Window covers for hatch. 4 to 6 sets.
 67. Special Tracker and drift sight tools, power changer test fixture.
 68. Small, flat bed dollies. B configuration. 2 ea.
 69. Aperture plates as required.
 70. Side brackets for installation of B configuration.
 71. Film footage graph.
 72. Shutter test set. B configuration.
 73. Handling rod. B configuration.
 74. Spare clock and data and counter assembly.
 75. Torque wrench. B configuration.
 76. Splicing board. B configuration.
 77. Wood spool and saddle. B configuration.
 78. Fish scale.
 79. String.
 80. Fuses.
 81. Sponges.
 82. Broom, mop, bucket, dust pan.
 83. 1/4 ton hoist.
- FAK support.

If two configurations of the same type are taken, essentially no support is required. If the configurations are split up, then selected major assembly items should be requested.

ENCLOSURE 4

22 November 1957

To:

From:

Subject: Comments on Detachment A Activities

STAT

1. Detachment's Deployment and Facilities.

After the Detachment departed to its overseas location, adjustments as to shop or section operation were made. The need of proper lighting, new equipment adaptations, and storage facilities came into being at various times. But having a representative our Photo Section act as an advance inspection party suitable facilities were acquired in a more expedient manner.

Living quarters and food were about par for the area wherever the Detachment was stationed.

The Supply Section had to adjust its methods and scope of operational demands over a period of time to accommodate the needs of our section.

Other sections, such as aircraft, electronics and operations were very cooperative throughout the tour of duty.

2. Ground Support Equipment.

Ground support was adequate and versatile. Additional equipment needs were fulfilled as best possible. When the B Camera came into the Photo Section's complement, the shop was changed to accommodate the loading and unloading of the film, plus proper maintenance of support gear.

a. Improvement of support equipment.

(1) Rollers or a dolly as a means of making the monster more mobile.

(2) Lining and installation of compartments in the drawers of the tote benches to accommodate precision tools and a proper place for each tool.

Page 2

b. Battery Cart Fallacy.

A problem of deploying battery carts from one area to another or staging was encountered to keep at an operational level. Batteries in a charged condition were filled with acid and had to be dumped of their contents before they were installed in the carts to be moved on to an advanced location. This was evident upon our second deployment in that one battery cart in its respective container was shipped up side down. This allowed the acid to spill on to the electrical wiring, inverter and vacuum pump, to a point of almost permanent damage.

To keep batteries at a charged condition, they were handled by the aircraft and base motor pool sections. Time and expediency was slow in accomplishing this goal. The charging rectifiers maintained by the aircraft section were at different times inoperative due to the matching of the proper voltage and phase, faulty parts and personnel at disposal to complete the desired tasks, thus adding to the above problem.

3. Camera Equipment Comments.

A desire in improvement of the A-2 mount to make the removal and installation of magazine to the oblique camera without a tight fit and damage to the magazine. The camera and adjacent equipment was handled with the utmost care at all times.

4. Supervision and Group Personnel.

The group encountered organizational problems because of last minute changes of different personnel before deployment. Supervisor and senior engineer were not known until the Detachment was in place approximately two months after deployment. The definite level of knowledge of each individual's background and area of specialty was not known to the above. Assignment of job coverage was not fully suited to the individual, thus, the pool of resourcefulness of the group was not utilized to the utmost. At different times decisions of equipment maintenance were questionable as to who or what section would incur the responsibility. As an example, hatch blower, heating, and cover ejection on the hatches were maintained by our section.

5. Cross Training.

Cross training procedure was on-the-job training. Individuals were limited as to certain units of equipment in job assignment. The training program that was pursued maintained a certain proficiency level for operational requirements. Procedure and persistence of this training program remained static until completion of contract assignment.

ENCLOSURE 5

18 November 1957

STAT

To: [Redacted]
From: [Redacted]

Subject: General Operation Overseas of A Detachment

I Purpose:

- A To discuss general operation
- B To discuss facilities and support
- C Supply problem
- D Operational requirements
- E Equipment
- F Living conditions
- G Recommendations

II General Discussion:

Arriving at our overseas base 5 May 1956, we immediately proceeded to unload equipment and materials and set up the Photo Section shop and lab. The advance party consisting of [Redacted] and [Redacted] had the shop area ready for us including the electrical, plumbing and other facility requirements necessary for the shop area. All operational equipment was checked out and made ready for equipment operational test flights and results evaluated.

STAT
STAT

Somewhere top level directors came up with a problem which required the detachment to redeploy in June 1956 to a second base. All equipment was packed and moved out. Once again, the advance party had the shop area and shop facilities readied. The base AIC were most cooperative and worked long, hard hours to accomplish the work orders that were requested. As the equipment arrived, it was unloaded by the Photo Section personnel from the C-119's and the C-124's. The shop area was set up and re-checking of operational equipment accomplished.

18 Nov 57
Page 2

We were alerted in July and carried out the missions that were assigned to us. The success we experienced from these missions gave everyone a satisfied feeling and seemed good for morale.

The greatest problem within the detachment was with the Supply Section. The Supply Section attempted to tell us of our needs and in what quantities when requesting parts or materials from them, or that we did not need a certain part. Many parts that were to be drawn from Supply were not available. Later we found that many items had been shipped to our third base, in anticipation of our next change of station. This resulted in having the Detachment Commander direct the supply section to procure these parts that were requested.

The supply section was not cooperative in the loading and unloading of items received or shipped. This usually had to be accomplished by the personnel from the Photo Section, whenever materials and equipment belonging to the Photo Section were involved.

Operational requirements as first conceived, had to be changed. This was a headquarters' problem, and resulted in maintaining a constant capability. Headquarters directed our status as to "Standby", "Alert", or "Stand-down".

The procedure in Detachment A was as follows: We would receive a "Standby" request from Headquarters. Then an "Alert" order would follow. We would receive the "Alert" 24 hours prior to the mission. The mission would be confirmed approximately 12 hours prior to launching.

One additional configuration was readied and installed in a standby aircraft as a part of each operational mission preparation. This was a precaution taken, in case of a failure in the first aircraft prior to takeoff.

The supervisor, senior engineer, would be present on the runway for takeoff. This was for last minute inspection or checking of hatch windows and covers as well as bubbles. The hatches were ejected after launching if conditions were such that water, pebbles, or loose dirt existed on the runway. Otherwise, hatch covers were pulled prior to launching.

18 Nov 57

Page 3

Upon return of aircraft from the mission, the aircraft is met by members of the Photo Section and hatch covers installed. We are also able to obtain information from the pilot at this time regarding equipment performance.

As soon as the aircraft is in the hangar the equipment is given a postflight check and removed from the aircraft, and taken into the shop. The magazines are unloaded and a test clip prepared and the take canned and boxed for shipment. (A test clip is taken to determine the equipment performance and evaluation.)

During a "Stand-down" period, we would accomplish maintenance on the equipment. This was also a period in which a training program was initiated for the purpose of aiding in maintaining a proficiency level, and periodic equipment operational checkout made.

To support our operational requirements, a mobility plan had been made up. This plan covered several different types of operations and were designed to fit the needs of any given operation. This included a list of equipment and materials, box numbers, a breakdown by name assigning individuals responsible for blocks of equipment. This was part of the preparation plan for any staging operations.

Equipment was checked and rechecked. Even in cases where new modified equipment had been received, and a certification to having been checked in plant. This was done as a precaution as in our situation, we couldn't be too thorough. This is not meant to be a reflection against anyone, but merely a precaution taken. This procedure was a standard policy of our section in Detachment A.

Detachment A was re-deployed to a third base in October 1956. The experience from the previous deployments aided in accomplishing this move with more ease. The advance party had coordinated plans to make ready the facilities in the new work area. All needed changes and proposals had been drawn up by D. Thatcher and submitted to USAFE headquarters. All facility requirements and changes were made known to the headquarters planning board and agreed upon. The contractor for the base had somehow misinterpreted these plans and instituted changes of his own without consulting headquarters USAFE. This caused some confusion and delay in getting the shop area set up. Re-routing of wiring and plumbing and other facilities associated with the photo section were corrected by personnel in the photo section.

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ENCLOSURE

6

26 November 1957

STAT

To:

From:

Subject: Staging Operation

I PURPOSE

- A. To discuss planning factors.
- B. To discuss facilities and support at the forward base.
- C. To list equipment used.
- D. To make recommendations for future operations.

II PLANNING FACTORS

In order that proper planning may be effected, it is necessary that the following be known:

- A. Facilities and support at the forward base.
- B. Mission requirements.
- C. Available air transportation for movement to the forward base.
- D. Support that the home base will have to provide.
- E. Living and climatic conditions in order to select personnel for the operation.

The facilities and support at the forward base can be accurately determined only by a survey team prior to the actual staging. This team should be composed of members of all groups that will require a particular type of facility, or support. Such a survey was conducted in this case, but did not include a member of our Section.

When facilities and support are very limited as was in this instance it might be well to send a preparation team prior to deployment. An advance party which included personnel of our section was deployed prior to the arrival of the aircraft. However, the preparation team should be sent for the express purpose of preparing the forward area to accept equipment. The area should be clean, air conditioned, and any necessary construction should be completed prior to arrival of equipment at the forward area. If this were accomplished, material would not be exposed to extreme temperatures and equipment would not be exposed to dirt and dust.

Operational requirements should be known in order that the supervisor can adequately plan equipment, supplies and personnel requirements.

Subject: Staging Operation, cont'd.

Available air transportation, facilities and support of the forward base will determine the support mission of the home base. During this staging operation adequate air transportation was available. Since limited facilities were available at the forward area, the home base was required to process clips and tracker film. The "take" was prepared for shipment immediately after touchdown. Clips were taken and placed in film cans and sent back to the home base for processing. In a matter of 16 to 20 hours the clips and tracker results were known at the forward base.

The selection of personnel for a staging operation is of paramount importance. It is imperative that maximum group cooperation exists. Therefore, personnel should be selected with this view in mind consistent with the integrity of the unit.

Consideration must be given to physical and mental hardships that may be imposed at the forward area. In this particular operation, the weather was hot and humid with temperatures up to 112 degrees. Nights were hot and the hotel rooms were not air-conditioned. Also, skin infections, Asiatic flu and dysentery were prevalent. Food was heavily spiced and not always appetizing. Some personnel lost up to twenty pounds during the operation.

III FACILITIES AND SUPPORT AT THE FORWARD BASE

A. Work shop area consisted of a room approximately 12' x 20'. This room had to accommodate film storage as well as serve as a shop area. A few boxes of film were stored in another air-conditioned room. This arrangement made for a very cramped working area. Delays in mission preparation resulted due to the fact that film loading and configuration testing could not be accomplished at the same time. This became a serious problem when three missions per day were flown. Configurations were stored in doghouses and placed in the hangar area. This arrangement resulted in a lot of handling of the configurations.

B. Processing.

All processing was accomplished at the home base, and the procedure has been outlined previously in this report.

C. Electrical system.

The power source was supposed to be 220 volts. However, we found that current fluctuated from 160 to 220. Also, the wiring was in such poor shape that a member of the Photo Section had to check out all wiring. For the 28 volt requirement, a four-cylinder generator and a rectifier were obtained for this purpose.

Subject: Staging Operation, cont'd.

D. General support.

A lift truck was provided at the forward base. Also, flat-bed trucks were obtained from local base people on a loan basis. All loading and off-loading at aircraft was accomplished by staging personnel.

IV PACKING LIST

A. Configurations.

Initially, two A-2 Configurations and two B Configurations were taken on the staging. Due to operational requirements, that figure was increased. Since no spare HM-732 Magazines were available, a problem resulted when one of the magazines came up with jammed locking spindle. This was not a planning oversight. No spare magazines were available at the home base. A requirement for three A-2 Missions came up and a B Configuration had to be substituted. The B failed after a few minutes of operation.

B. Trackers.

Initially, three were taken but I believe that figure was increased to four after the arrival of the third aircraft.

C. General support items.

1. Photo hatch, two for each aircraft. ("A" & "B")
2. Hatch cart, one each.
3. Electrical test set.
4. Larsen Recorder.
5. Lens cleaning, kit.
6. Vacuum cleaner.
7. Forward bulkhead fittings, four sets.
8. Tool boxes, two each.
9. Simpson multimeter, with test prod. and leads, one set.
10. Safelight, two each.
11. Purging fixtures and hoses.
12. Nitrogen bottle.
13. One work bench.
14. Extension cord with light.
15. Several feet of wiring.
16. Nails, hammer, nail puller and handsaw.
17. Kimwipes, two boxes.
18. Two-inch masking tape, six rolls.
19. One-inch splicing tape, four rolls.
20. Pre-post check lists, maintenance forms, applicable technical manuals, and drawings, envelopes, and office supplies.

Subject: Staging Operation, cont'd.

C. General support items, cont'd.

21. 732 key wrench, two each.
22. 732 loading stand, one each.
23. 732 jig stand, one each.
24. Fish scales, two each.
25. Glyptal, acetone, alcohol, mil-Spec oil, low-temp grease.
26. Scissors, two each.
27. Razor blades.
28. Flashlight.
29. Pip pins.
30. Black, spray can paint, three cans.
31. Rubber mat, two each.
32. Clevis for slings, two each.
33. Solder and hookup wire.
34. Film splicing board.
35. Cleaning rags.
36. Shutter test set, B Configuration.
37. Wood spool and saddle, B Configuration.
38. 1/4 ton hoist.
39. Torque wrench, B Configuration.
40. Film cans, 100', six each.

All personnel submitted lists of items for their particular work area to the senior engineer, who checked the list for completeness, and the items were then packed for shipment.

V RECOMMENDATIONS

- A. A member of the Photo Section be included in the survey team.
- B. A preparation team be sent to prepare the forward area to accept equipment.
- C. A rotation of personnel where living conditions are poor.

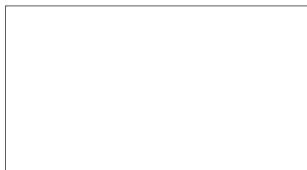
ENCLOSURE

7

3 December 1957

STAT


To:



From:

Subject: Detachment Staging Missions

STAT

- 1.1 As Detachment A had not been called upon to do staging, the suggestions following are mostly from our mobility plan and discussions with  that took place when Detachment A was scheduled to do a staging mission.
- 1.2 Special Equipment Sections mobility plan gives the logistical data that was compiled during the above mentioned time and are on file in the office.
- 2.1 Equipment. The general plan took into account three basic forms of staging: (1) No base housing, shops or supply; (2) Housing furnished with limited shop and supply; and (3) Complete base, shops, hangars, supply, etc., available.
- 2.2 Under condition (1), we would furnish all facilities, supplies, etc., and under this plan arrangements were made to obtain standard AF shop tents, dark room tents ~~on~~ trailers. These would be heated or air-conditioned as the situation demanded. Plywood sheets for flooring were also ordered. A 60 cycle generator of sufficient size to handle the section along with 28 vdc rectifiers. Woodworking and general tools sufficient to accomplish construction.
- 2.3 It was recommended that seven to eight men be included in the staging complement. The processor and one other man would be left at the base to support the mission. The main reason for taking seven to eight men is that on almost any mission there is so much work to be done in setting up and taking down a section, hauling supplies, plus getting ready for missions. If only four men were taken they would be so tired that their basic work would suffer. Also, the possibility of one or more men getting sick is very probable. The tendency of the squadron to hold down each section to a very minimum mission force is many times unavoidable but should be resisted as much as possible, keeping in mind the successful accomplishment of the mission. If a very small force must be used, every effort must be made to rotate the men at seven to ten day intervals.
- 2.4 If readily available, air transport is used. The most efficient staging can be accomplished by loading, unloading magazines at the home base using the magazine transport cases. Major equipment maintenance could be done at the home base also. This would eliminate extensive construction of darkrooms at

Page 2

Subj: Detachment Staging Missions

the forward base. Only one shop would be needed for assembly and checkout of the equipment.

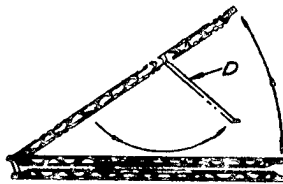
- 2.5 The forward base should be as small and simple as possible as time and energy expended in lavish bases is wasted unless it cannot be avoided due to lack of transportation.
- 2.6 Using the above system two or three tote benches would be all that would be needed. These would hold all tools, spares, etc.
- 3.1 Under conditions (2) and (3) mentioned in 2.1, equipment and construction needed would depend on the conditions found at the forward base selected and would of course vary greatly. If the basic shop space is available, all that is needed is to connect power outlets and move in. Oh, Happy Day!
- 3.2 Prime factors in any shop area would be dust free and air-conditioned space. If air-conditioning cannot be had, dust free space must be provided.
- 3.3 If a supply of film must be maintained at the base, it must be properly stored. This is often very difficult to do and the procedure outlined in 2.4 is the most convenient method of overcoming this problem.

STAT

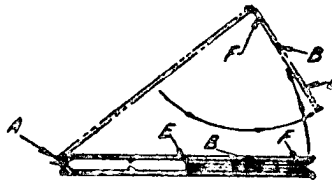
ENCLOSURE 8

MIL-T-10069A

ERECTION INSTRUCTIONS FOR TENT, FWWMR, MAINTENANCE SHELTER

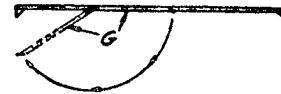


PART 1 (RIDGE)
1-REQUIRED-
CRATE NO. 1



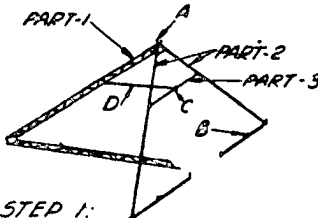
PART 2 (TRUSS AND WALL POST ASSEMBLY)
3-REQ'D- CRATES NO. 2 AND 3

PART 3 (TRUSS BRACE)
3-REQUIRED- CRATE NO. 1

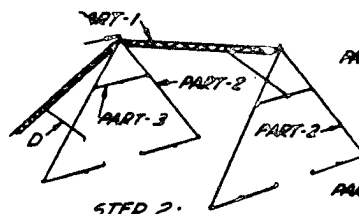


PART 4 (WALL PURLIN)
4-REQ'D- CRATES NO. 1 AND 2

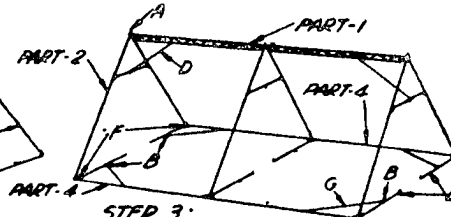
FRAME PARTS SHOWN AS REMOVED FROM CRATES



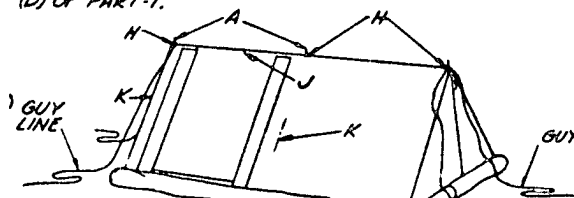
STEP 1:
PLACE ONE END OF RIDGE (PART-1) ON SPINDLE (A) AT TOP OF TRUSS AND WALL POST ASSEMBLY (PART-2). SEE THAT KNEE BRACE LUGS (B) ARE TOWARD INSIDE OF FRAME. ATTACH TRUSS BRACE (PART-3) TO PART-2 WITH BOLT (C) ON UNDER SIDE, AND ATTACH KNEE BRACE (D) OF PART-1.



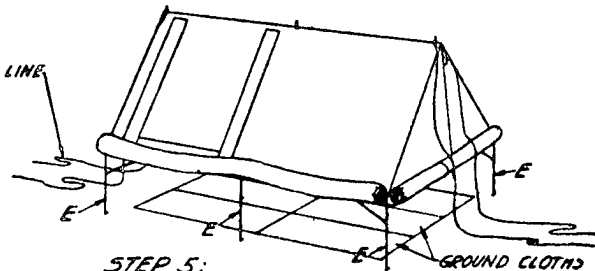
STEP 2:
OPEN RIDGE (PART-1) TO ITS FULL LENGTH AND ATTACH SECOND TRUSS AND WALL POST ASSEMBLY (PART-2) AT CENTER OF RIDGE IN SAME WAY AS IN STEP-1.



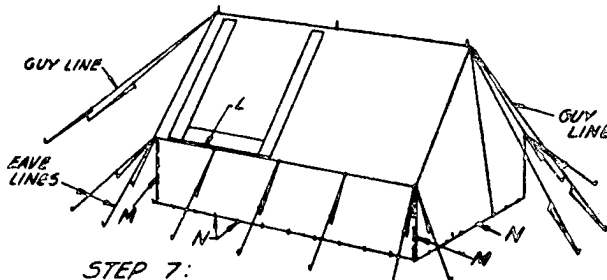
STEP 3:
RAISE OTHER END OF RIDGE (PART-1) AND ATTACH THIRD TRUSS AND WALL POST ASSEMBLY (PART-2) WITH KNEE BRACE LUGS (B) TOWARD INSIDE OF FRAME. ATTACH PART 3 AND KNEE BRACE (D) AS BEFORE. WITH WALL POSTS (E) STILL ON GROUND, ATTACH FOUR WALL PURLINS (PART-4) TO LUGS (F) OF PART-2. ATTACH KNEE BRACES (G) TO LUGS (B).



STEP 4:
REMOVE TENT FROM COVER AND UNFOLD PARTLY TO EXPOSE 3 RIDGE GROMMETS (N). PLACE THESE GROMMETS OVER SPINDLES (A). ON INSIDE, LACE TO RIDGE AT (J) AND TO PARTS 2 AT (K). ATTACH GUY LINES AT ENDS OF RIDGE.



STEP 5:
RAISE 3 WALL POSTS (E) AT ONE SIDE.



STEP 6:
REPEAT STEP 5 ON OTHER SIDE. SPREAD GROUND CLOTHS INSIDE OF FRAME.

STEP 7:
LACE INSIDE OF EAVE AT (L) TO WALL PURLIN. LACE CORNERS (M). DRIVE ALL PINS. SECURE FOOTSTOPS (N). ADJUST AND TIGHTEN EAVE LINES AND GUY LINES.

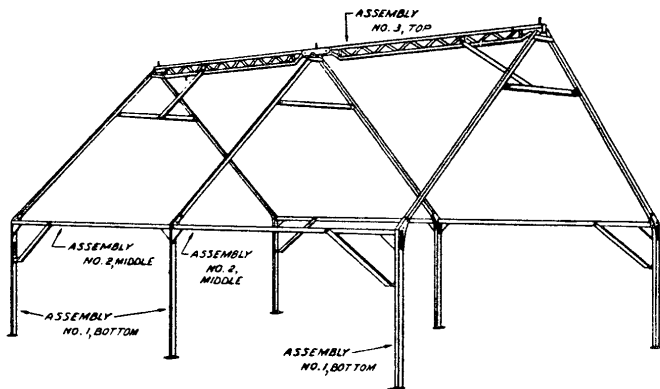
STEP 6:
REPEAT STEP 5 ON OTHER SIDE. SPREAD GROUND CLOTHS INSIDE OF FRAME.

COMPONENTS:

- 2- GUY LINES
- 1- FRAME (3- CRATES)
- 1- TENT WITH COVER
- 38- 16" TENT PINS
- 18- 24" TENT PINS
- 6- GROUND CLOTHS

NOTE: THIS MINIATURE COPY IS IDENTICAL TO QUARTERMASTER CORPS PLATE NO. TO REQ. 1

FIGURE 16.-Erection instructions for tent, FWWMR, maintenance shelter.

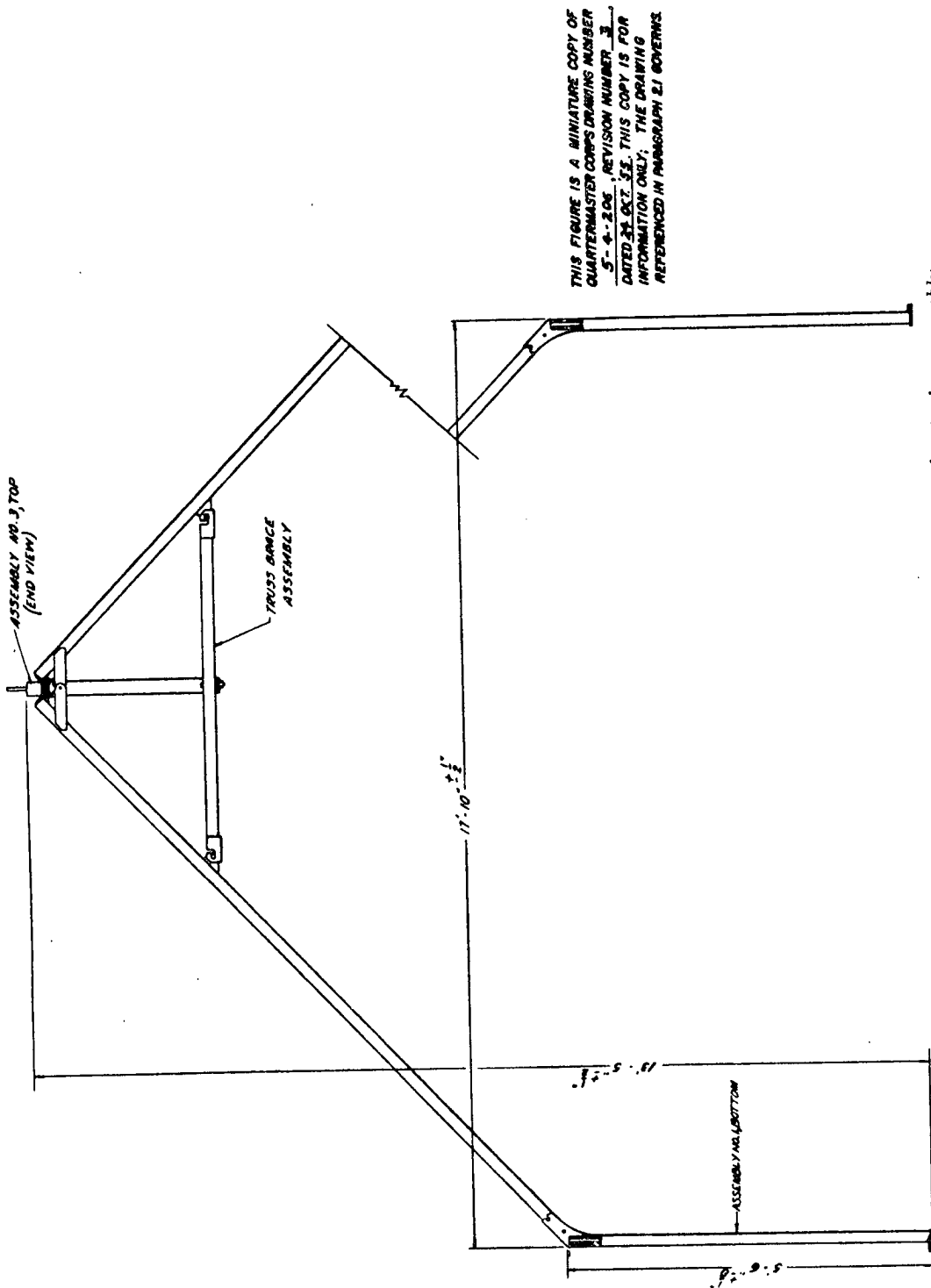


LIST OF DRAWINGS	DOC. NOS.
FRAMES, TEXT, MAINTENANCE SHELTER (ARMORED FORCE)	
ILLUSTRATION	5-4-205
FRONT VIEW, ASSEMBLY	5-4-206
SIDE VIEW, ASSEMBLY	5-4-207
ASSEMBLY NO.1 BOTTOM AND NO.2 MIDDLE	5-4-208
ASSEMBLY NO.3 TOP	5-4-209
END POST ASSEMBLY AND DETAILS	5-4-210
RIGHT AND LEFT TRUSS ASSEMBLY AND DETAILS	5-4-211
RIGHT AND LEFT TRUSS DETAILS	5-4-212
EDGE POLE ASSEMBLY AND SECTIONS	5-4-213
EDGE POLE DETAILS	5-4-214
EDGE POLE DETAILS AND COUPLING LINK ASSEMBLY AND DETAILS	5-4-215
EDGE POLE END BRACE ASSEMBLY AND DETAILS	5-4-216
TRUSS BRACE ASSEMBLY AND DETAILS	5-4-217
EDGE STRUT ASSEMBLY AND DETAILS	5-4-218
EDGE STRUT END BRACE ASSEMBLY AND DETAILS	5-4-219

THIS FIGURE IS A MINIATURE COPY OF QUARTERMASTER CORPS DRAWING NUMBER 5-4-205, REVISION NUMBER 4, DATED 24 OCT '58. THIS COPY IS FOR INFORMATION ONLY; THE DRAWING REFERENCED IN PARAGRAPH 2.1 GOVERNS.

FIGURE 1. Frame, tent, maintenance shelter, complete; illustration.

MIL-F-1461C



THIS FIGURE IS A MINIATURE COPY OF
QUARTERMASTER CORPS DRAWING NUMBER
5-4-204, REVISION NUMBER 3,
DATED 21 OCT 55. THIS COPY IS FOR
INFORMATION ONLY; THE DRAWING
REFERENCED IN PARAGRAPH 2J GOVERNS.

FIGURE 2. Frame, tent, maintenance shelter, complete; front view assembly.

ENCLOSURE 9

darkroom is provided by a light trap and blower assembly. One water outlet and 115 v ac 60 cycle electrical outlets are furnished each darkroom. Each darkroom has a 24 in. wide x 62 in. long x 7 in. deep plywood sink and is ventilated. The front of each darkroom tent may be rolled up for moving equipment. The tents may be combined to form one ventilated 6 x 12 ft darkroom.

PURPOSE AND RECOMMENDED USE:

Used inside suitable shelter for field processing. A normal set uses the Type N-1 Kit in one darkroom and a Type N-2 Kit in the other darkroom.

CAPABILITIES:

1. Maximum productive capacity: 2 each 6 x 6 ft darkrooms.
2. Manpower requirements for operating: None, after set up.

- pare for operation: 2 men, 1 hour.
2. Special tools required for assembly and use: None.
3. Time and manpower required for disassembly and preparation for shipment: 2 men, 1 hour.
4. Recommended installation and shelter required: On level surface and under cover.
5. Floor space required when in use: 85 sq ft.

TECHNICAL SPECIFICATIONS:

1. Electrical requirements: 115 v ac, 60 cyc, 200 watts minimum plus convenience outlets up to 100 w maximum.
2. Water requirements: Depends on equipment.
3. Temperature requirements: Room conditions.
4. Weight of unit crated: 950 lb.
5. Weight of unit uncrated: 895 lb.
6. Number of boxes required for shipment (boxes are part of unit): Five.
7. Overall dimensions: uncrated—685 cu ft, crated—47 cu ft.
8. Spec. No. MIL-D-4162. T. O. No. 10-1-130.

<i>Title</i>	<i>Status</i>
DARKROOM KIT, PHOTOGRAPHIC, AIR PORTABLE, TYPE U-1	Standard

DESCRIPTION:

The Type U-2 darkroom kit provides a large 14 x 14 foot wall tent, suitable for operation of several contact or projection printers. It is not suitable for film processing except at night. Two high capacity blower fans will provide a complete air change in one minute. No furniture or apparatus is furnished.

PURPOSE AND RECOMMENDED USE:

Darkroom for field printing or night film processing.

CAPABILITIES:

1. Manpower requirements for operating: None after set up.

MOBILITY:

1. Time and manpower required to assemble and prepare for operation: 7 men, 2 hours.
2. Special tools required for assembly and use: None.

3. Time and manpower required for disassembly and preparation for shipment: 7 men, 4 hour.
4. Recommended installation and shelter required: Outdoors in temperate weather sheltered from wind.
5. Floor space required when in use: 196 sq ft.

TECHNICAL SPECIFICATIONS:

1. Electrical requirements: 115 v ac, 700 watts for blowers, 300 watts additional permitted for equipment.
2. Temperature requirements: Temperate climate.
3. Weight of unit crated: 675 lb.
4. Weight of unit uncrated: 675 lb.
5. Number of boxes required for shipment (boxes are part of unit): 4.
6. Overall dimensions: crated—(1) 20 in. x 20 in. x 18 in. (2) 34 in. x 30 in. x 24 in., uncrated—(1) 7 ft x 1 ft x 1 ft, (2) 18 ft x 15 ft x 11 ft.
7. Spec. No. 75-471. T. O. No. 10-25-66.

<i>Title</i>	<i>Status</i>
KIT, PHOTOGRAPHIC DARKROOM, TYPE U-2	Standard

ENCLOSURE 10

LIST OF ADDITIONAL SUPPORT ITEMS

Note: The following listed items do not appear in either FAK or UME lists for the Special Equipment section. Some of the items may, however, be included in lists of other sections within a Detachment.

Group I Major Equipment

<u>Item</u>	<u>Qty.</u>	<u>Nomenclature and Description</u>
1		Configurations with shipping containers
2		Trackers with shipping boxes
3		Hatch, A/C Photo, Types A, B or C with covers
4	1	Cart, Hatch (without handle)
5	1	De-humidifier, Portable refrigeration unit, USAF type A-1 or equiv., (required in certain areas only)
6	1	Dryer, Roll film, Portable,
7	1	100 volt, 60 cycle, 1 phase
8	1	Developer, Similar to B-5 type
9	1	Temperature Control Unit, type N-9
10	1	Installation Shelter (Ref. Para 2.3.7)
11	1	U-1 or U-2 Portable Darkroom
12	1	Fork Lift
13	1	"A" Frame, Portable, (Ref. Para. 2.5.1)
14	1	Processor, Aerial roll film type B-5
		Sink, Portable

} For 70mm
Negative Processing
if required

Group II Miscellaneous Equipment

<u>Item</u>	<u>Qty.</u>	<u>Nomenclature and Description</u>
1	2 sets	Fitting, Forward Bulkhead, Part 731984
2	1	Spool, Stripping, 1800' with flange removed
3	1 set	Fixtures, Nitrogen Purging with hoses
4	6	Cans, Film 9 1/2" X 390' (Empty)
5	6	Spools, Film 9 1/2" X 100' (Empty)
6	1	Spotlight, Battery Operated
7	2	Mat, Rubber, for Magazine loading
8	1 kit	Broom, Mop, Bucket, Dustpan

List of Additional Support Items, cont'd.

Group III Chemicals

<u>Item</u>	<u>Qty.</u>	<u>Nomenclature and Description</u>
1		Developer, type D-19 Pre-mixed concentrate in 1-5 gal. containers
2		Developer, type KD-20 Pre-mixed concentrate in 1-5 gal. containers (Required for 70mm processing)
3		Hypo with Hardner, Pre-mixed concentrate in 1-5 gal. containers

Group IV General Materials

Note: These items should be shipped with advance work party to ready Special Equipment Section Facility.

<u>Item</u>	<u>Qty.</u>	<u>Nomenclature and Description</u>
1	1 kit	Tools - Saw (cross-cut carpenters), Hammer, claw Tin snips, gas pliers Screwdriver, large Nail puller, 2 ea., monkey wrenches 12"
2	1 box	Nails, assorted
3	100'	Wire, rubber covered twin lead #14
4	100 sq. ft.	Curtain, black out
5	4 rolls	Tape, 2" armament
6	6 rolls	Tape, 1" masking
7	2 ea.	Extension cord, AC with light
8	1 ea.	First Aid Kit
9	2 ea.	AC convenience plug-in outlets
10	6 ea.	Plywood 4'x 8' x 1/4"
11	50'	Shelving 1"x 12" Pine
12	5 sets	Brackets, steel (for 12" shelving)