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Barbara L. Hendry

BARBARA L. HENDRY
Chief, Technical Services Division
USAF Historical Research Center

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WRAMA (AFLC)
Misc Corona Harvest Inputs on UH Helicopter

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IRIS WORKSHEET

015 CALL NUMBER (12AN): K205.149-7

005 IRIS NUMBER (7AN): 00917301

026 OLD ACCESSION NUMBER (12AN)

SECURITY WARNING/ADMIN MARKINGS

RD FR CN SA WI NF PV FQ FB

NO CONTRACT PROPRIETARY INFO

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MAIN ENTRY (Use one) (150AN)

100 PERSONAL NAME

WRAMA

TITLE (Use one) (DO NOT USE IF TITLE IS MAIN ENTRY) (150AN)

220 WRAMA data on UH-1H and UH-1P Helicopters

OR CHECK

☐ 221O ORAL HISTORY

☐ 224C CHECO MICROFILM

☐ 227P CALENDAR

250 TITLE EXTENSION: ENTER VOLUME NUMBER, PARTS, ETC. (20AN)

DATES: ONLY 264 OR 265 MUST BE COMPLETED; SUPPLY BOTH IF KNOWN.

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WRAMA/[illegible] (Fred Nelson/[illegible])

[illegible] Document Identification [illegible]

Hq [illegible] Studies Institute (AU)
Maxwell AFB, AL 36112
Attn: of Archives

1. Reference:

a. [illegible] University (AU) ltr (U[illegible]) dated 20 Aug 1970, subject as above.
b. [illegible] University (AU) ltr (U[illegible]) dated 20 Aug 1970, subject as above.
c. Same as a and b.

2. Copies of documents requested in referenced letters are attached.

FOR THE COMMANDER

[illegible] H. CHRISTIE
Chief, Plans and Programs Branch
Logistics Systems Management Division

3 Atch
1. UH-1M Helicopter Depot [illegible]
2. UH-1F Report
3. T-58 [illegible] Report (UH-1F Helicopter Engine Problems)

7-4763-4

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I. Subject: UH-1H Helicopter Depot IRAN Assistance Team Visit

II. Date of Visit: 23 January 1970 to 1 February 1970

III. Purpose of Visit: To present the UH-1H Depot IRAN plan as prepared by the Army to the VNAF and USAF Advisory Group and assist in dissemination of the material and understanding of the package.

IV. Team Composition:

WRAMA

Col M.R. Rhoades	WRND
Lt Jerry Clark	WRND-1
Robert B. Forbes	WRNDP
John W. Cherrington	WRNDR
James M. Midkiff	WRNDT

ARADMAC (SAVAE-K)

Don Wells
Lowell H. Johnson
Lt. J.W. Ozimek

BELL HELICOPTER

Carl W. Diehl
Carl L. Belt
Stan P. Krueger

V. Personnel Contacted:

PACAF

Cowan, Harold G. Colonel	DM
Neville, Harry W., Colonel	DMM
Rose, F.L. Jr., Colonel	DMW
Stringer, W.L., Colonel	DMSM
Kirkendall, E.L. Colonel	DML
Jewell, L.L., Colonel	DMM
Beasley, C.J., Colonel	DMS
Sharp, D.M., Lt Colonel	DMMB
Stockton, D.E., Lt Colonel	DPLF
Emmons, C.F., Lt Colonel	DPLFS
Pasley, John V., Lt Colonel	DMOM
Stryker, Lt Colonel	DMLX
Siefert, Charles, Major	DMLX
Culp, Ken, Major	DMMB
Mustico, Richard J., Major	DMMM
Kantoy, Rodney A., Captain	DMMB
Capps, Ted., Captain	DMMS
Pastor, Ronald., Captain	DMSA
Widner, Rodney C., Captain	DMWS
Sandidge, Robert D., CMSgt	DMWS

Atch 1

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Milliken, Jerry E., MSgt	DMMB
Williams, Charles F., MSgt	DFMTM
Dugan, Robert L., TSgt	DMSEA
Harrington, Robert T., Civ	DMSE
Milnikel, Edward J., Civ	DMSM

AFAT-3

Grooms, Wayne G., Colonel	Chief
Brandt, Charles A., Lt Col	Mat Mgt Adv
Dennis, Jeptha W. Jr., Lt Col	Sup Staff Adv
Wolfer, Leonard L., Lt Col	Acft Maint Staff Adv
Haggart, Philip E., Lt Col	Quality Cont Div Adv
Cole, Dewey G. Jr., Major	Log Mgt Div Adv
Satterwhite, Willard N. Jr,Capt	UH-1H SM Proj Officer
Gagnon, Donald J., Capt	Prod Cont Adv
Bucher, Wallace T., Capt	Avionics Staff Adv
Coose, Thomas R., Capt	Aero/Struc Eng Adv
Souders, Robert J., Capt	Acft Maint Adv
Umstot, Denis D., Capt	Mat Cont Div Adv

WRAMA

Fugate, Johnny W., Civ	WSLO Bien Hoa
Seitz, Jack, Civ	WSLO Da Nang

AFGP

Young, Kendall S., Brig Gen	Dep for Mil Assist & Ch USAF ADVSY GP
Schneck, Ralph H., Colonel	Dir of Materiel
Brewer, J.L., Lt Col	Chief Maint Div
Pollock, Leon O., Lt Col	Dep Dir of Mat
Redwine, Lawrence J., Maj	Chief Main Div
Taskanoski, Bill J., CMSgt	MME

VNAF

Col Ba	ALC Commander
Col Linh	VNAF Dir Mat
Lt Col Thuat	VNAF Plans (Project Officer)
Lt Col Nam	ALC MMC Commander
Maj Trung	ALC MEW Commander
Maj Chuc	ALC DS&T Commander

34th SUPPORT GROUP, AVIATION MATERIEL MANAGEMENT CENTER (AMMC)

Col Sam Cockerham	Commander 34th Gp
Col John Berger	Commander AMMC
Maj Shelton	Sup Div Chief AMMC
WO Miller	Sup VNAF Project Officer, AMMC

VI. Background:

a. In June 1969, WRAMA/WRND received a request from the Air Force Advisory

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Group/AFAT-3 for a requirements package in support of UH-1H IRAN crash/battle damage repair, and T53-L13 engine. To obtain this type package, SMAMA went to the U.S. Army Aeronautical Depot Maintenance Center (ARADMAC) at Corpus Christi, Texas because of their expertise on the UH-1H and much of the material needed was only available there. Not having enough time in which to assess those facilities and capabilities already available in VNAF, a package was designed to provide everything necessary for implementation of a UH-1H IRAN and crash/battle damage program. The package was constructed with a great deal of flexibility and enabled the VNAF to extract those portions of the plan which could be applied to existing facilities.

b. The package was designed for complete overhaul of 295 T53-L13 engines, and IRAN and crash/battle damage repair of 155 UH-1H's per year. The following is a complete list of what was provided:

(1) Organizational Charts
(2) Mission and Functions Booklet
(3) Personnel manning and skill levels
(4) Floor plans and machine layouts
(5) Tech Data Cards
(6) Production Control Procedures
(7) Tool and Equipment Lists
(8) Material Requirements Lists
(9) Fixture Drawings
(10) Work Requirements
(11) Test Cells which accommodate T53-L13 and T53-L7 engines

c. After the package was completed, the Advisory Group requested that a team from SMAMA and ARADMAC be made available to carry the information to Vietnam and to explain the contents to the VNAF and assist in any way possible. Bell Helicopter Company (BHC), the manufacturer of the UH-1H helicopter, offered to provide representatives at no cost to the Government. This offer was accepted and BHC provided three representatives.

VII. Discussion

a. The UH-1H depot facility package was formally presented five times. List and dates of presentations follow:

1. 25 Jan 71	PACAF/DM
2. 26 Jan 71	AFAT-3 and VNAF ALC
3. 28 Jan 71	AFAT-3 and VNAF ALC
4. 29 Jan 71	SMAMA Ind Eng Tech on the A-1 IRAN Team
5. 30 Jan 71	AFGP, AFAT-3 and Hqs VNAF

b. The remainder of the time was spent in detailed review of the package with specific personnel. The discussions were very satisfactory and provided an understanding of the package by the AFAT-3 team. As time permitted selected members of the team visited other organizations in the area. The significant items other than the UH-1H package with conclusions are listed in paragraph IX.

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VIII. Conclusions:

a. The VNAF UH-1H depot facility package was developed based on the assumption that no depot facility and capability existed at VNAF ALC (Vietnam Air Force Air Logistics Center) Bien Hoa AB, RVN. This assumption did not prove to be entirely correct. ALC does possess a limited capability which is being devoted to processing A-1, O-1, F-5 aircraft and J-85 engines. This was determined from the meetings with AFAT-3 and a review of the facilities. The facilities do provide a base from which to develop a UH-1H depot capability. There are several decisions that must be made before the UH-1H package can be effectively utilized. These decisions are beyond the responsibility and/or authority of the VNAF UH-1H depot facility team. Until these decisions are made an aggressive depot facility plan cannot be developed and pursued. If a desire exists to review all alternatives prior to making the basic decisions the development of the facility and capability will be hindered and will take considerable more lead time than otherwise necessary. The alternatives are too numerous to explore. The most significant of these decisions are:

1. What facilities existing and planned will be allocated to support the VNAF UH-1H?

2. What is the workload mix planned and/or desired for accomplishment by VNAF ALC? Current aircraft systems assigned are UH-1H, A-1, O-1, A-37, U-17, F-5, H-34, C-47, C-119, with the CH-47, C-123 and T-41 scheduled for activation?

3. What funding and manpower limitations will be placed on the ALC portion of the VNAF I and M Program.

b. The presentation meetings with AFGP and AFAT-3 resulted in the establishment of an AFAT-3 team composed of Lt Col Philip E. Haggart, Captain W.N. Satterwhite and Captain Donald J. Gagnon to develop a depot facility and capability plan for implementation by and for the VNAF ALC. The team will be given assistance by Mr. White, SMAMA, Industrial Engineer Technician, on site as required. The AFAT-3 team presented a list of assumptions they would use as a basis in development of the VNAF ALC depot facility plan. A tentative deadline for completion of the plan is 31 March 1970.

c. AFAT-3 has been authorized to contact the source for answers to any questions that may arise on the UH-1H depot facility plan after departure of the WRAMA/ARADMAC team. They must however info all concerned organizations.

d. There were two MRL's presented to AFAT-3. One of the MRL's was based on the ARADMAC TRDAR program. The other was based on BHC Crash Battle damage repair. The MRL's were considered 85% adequate. The ARADMAC MRL contained approximately 1800 line items whereas the BHC MRL contained 2400 line items.

e. BHC furnished lead times for most of the equipment required to set up the UH-1H depot facility. Review of the package along with the lead times dictated that a target for receipt of 95% of the equipment would be eighteen (18) months.

f. The UH-1H VNAF ALC capability will in all probability not be ready to process the first group of helicopters for depot level maintenance. AFAT-3 will advise WRAMA if assistance is required.

g. WRAMA suggested that as soon as a plan for the implementation of the program is finalized that members from AFAT-3 present the plan to representatives from Hq PACAF, AFLC, WRAMA, and other concerned activities. This would enable everyone to see the entire program and clear up any questions with the AFAT-3 representatives. Also specific guidelines could be drawn up in order to implement the program in an effective and timely manner.

IX. Other Significant Items

a. Colonel Rhoades briefed Brig Gen. Paul Latch 7th AF on the purpose for the team visit and also the UH-1H program.

b. The Lear Siegler Contract field team at Bien Hoa is accomplishing all work on the H-34 considered to be depot level. WRAMA assistance is not required on contracting the H-34 workload.

c. The 34th General Support Group estimates the requirements in support of VNAF UH-1H Helicopters to be 500 hours per month for labor at $6.00 per hour and $2000 per month for material. In 6 months the labor will increase to 1000 hours per month and material to $4000 per month.

d. Information on the M-93 gun system was given to AFAT-3 along with the installation Tech Order. Using the Tech Order they will check existing manpower available for the installation and advise WRAMA if assistance is needed.

e. Meetings were held with WRAMA team, AFAT-3 personnel and AMMC (Army) personnel to discuss and resolve support problem between WRAMA, AMMC and VNAF for UH-1H MAP program. VNAF NORS requisitions are handcarried to AMMC and AMMC makes direct shipment to Wing needing the items. AMMC could not tell the difference between NORS and A/NORS requisitions and requested all NORS documents be processed in the same manner. The status on NORS requisitions will be held by AMMC until requisition has been forwarded to AMMC by WRAMA. The Joint Support List (JSL) was discussed and the JSL furnished by AVSCOM will be used and only the items on this JSL indicating Army support items will be considered as a JSL item. AMMC will assist WRAMA in finalizing a JSL of all UH-1H Army supported items. Since corrections have been made in the processing procedures on VNAF requisitions the processing time has been reduced from 15 days to 3 days. VNAF will use the 4000 series document number for AIMI items and other special needed items WRAMA and AMMC will make a monthly reconciliation of their records. VNAF will accomplish a reconciliation with AMMC every 90 days. The VNAF and AFAT-3 personnel were advised to use Weapon System Designator 76 only on JSL items, to be supported by the Army. It was explained to them that Air Force and DSA/GSA items cannot be sent to supply point direct by H051 system at AFLC with WSD 76 on the document. The WSD 76 sends the requisitions to WRAMA D034 system then WRAMA must process to correct AMA or DSA activity with processing time loss. VNAF and AFAT-3 agreed and they will use WSD 76 only on JSL item requisitions.

f. Bell's Flight Engineer visited the 211th and 217th VNAF Helicopter Sq at Binh Thuy where he flew the aircraft. Vibrations were stated to be the main problem with the aircraft availability. Test pilots require more flight time before being able to diagnose and make suggestions to correct the vibration. Supply was no problem, however, there would seem to be a higher replacement factor due to the vibrations. Also visited the 215th VNAF Helicopter Sq at Nha Trang and 213th at Da Nang. These UH-1H's were in good shape. Personnel skills seemed good as were the facilities. Technical manual usage and comprehension were good, however, it was expressed that up to date manuals were unavailable and there was a shortage of high usage items. Lateral transfer of material is rare creating "have and have not" supply between squadrons.

4. Actions to be Taken

a. SAAMA

1. Review Material Requirements List (MRL) and develop an adequate MRL to support depot level processing of UH-1H by VNAF ALC.

2. Monitor UH-1H program in support of VNAF and take action to provide equipment upon receipt of requirements from AFAT-3/AFGP.

3. Furnish AFAT-3 a copy of the UH-1F phase inspection requirements. This will be used for evaluation against the UH-1H.

4. Initiate action to have WO Miller from the Army Material Management Center of the 34th Group come to SAAMA with all VNAF and AMMC open documents and run a complete reconciliation.

5. Take action to assure all VNAF and AFAT activities receive interim/may form change to Tech Manuals. Obtain and furnish AFAT-3 standard manhour data for IRAN, CRD repair of UH-1H helicopter, engine and components.

b. AFAT-3

1. Perform a study to define the priority, workload mix, manning facility and equipment requirements to accomplish the mission of the Air Logistics Command. Integrate the UH-1H planning information as an integral part of this study. This study is to be completed within 60 days. Progress reports will be submitted as major milestones occur.

2. Notify SMAMA/SAAMA of assistance required to establish the VNAF ALC UH-1H depot capability.

SIGNATURES:

COL W. G. GROOMS
AFAT-3

COL W. R. RHOADES
WRAMA/WRND

-4-

R E P O R T

WRAMA ASSISTANCE TEAM

UH-1P

14 November 1969

WRAMA Assistance Team, UH-1P
TUY HOA AB, RVN

Purpose of Team Visit: Evaluate T-58 engine performance and FOD problems.

Background: The latest in a series of aircraft accidents/incidents occurred on 21 Oct 69 at BMT, RVN, and resulted in the loss of aircraft, SN 63-13155. The Accident Board found the cause to be engine power loss, engine SN 279181. Engine was forwarded to Naval Overhaul Facility at North Island, California for priority investigation to be accomplished in the presence of representatives from 31FMS, OCAMA and GE personnel. The remaining 20th SOS aircraft were restricted to training missions at Tuy Hoa on 22 Oct 69. WRAMA offered 7AF team assistance which 7AF accepted 3 Nov 69. Team personnel (see Atch 1) assembled at Tuy Hoa AB, RVN on 6 Nov 69. This team was a follow-on to the T-58 COSMAT:OCAMA/WRAMA/GE team effort in Sep 69. Col Kuhn, 7AF/DMM, Col Cox, 31st DCMM, and key 31st FMS and 20th SOS personnel briefed the team upon arrival at Tuy Hoa.

Previous Engine Actions 12 Sep 69 COSMAT: (See Atch 2)

WRAMA Team Actions:

1. Reviewed 13 month accident/incident history (see Atch 3).

2. Inspected all on-board UH-1P aircraft for general maintenance and FOD potential in air intake/transmission pylon area.

3. Reviewed status Sep 69 team recommendations to determine extent of accomplishments.

4. Inspected six (6) installed T-58 engines to determine extent of any possible FOD damage to compressor plus extent of maintenance being performed.

5. Visited/inspected forward operating location (FOL) to determine environmental operating conditions and extent and condition of facilities.

6. Reviewed 13 month engine removal history to determine total number removed, number removed for FOD and flying hours involved. (See Atch 4).

7. Inspected Bench Stock Area, Tuy Hoa, to determine facilities available, parts on hand and general operating conditions.

8. Reviewed engine shop and tech data to determine general conditions, adequacy of engine maintenance and engine tech data.

9. Reviewed 20th SOS manning to determine adequacy of numbers and skill levels.

10. Reviewed accident board personnel composition.

11. Reviewed fuel contamination history to determine extent of problem.

12. Performed 20th SOS facility review to determine adequacy.

13. Reviewed 1H-1(U)F-1 Flight Manual data and operations.

14. Special WRAMA/7AF/14SOW/31FMS management reviews.

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Conclusions:

1. Review of 13 month accident/incident history shows twenty-two (22) mishaps, nineteen (19) of which were caused by engine power loss. Remaining three were of undetermined nature. Ten (10) of the nineteen (19) power losses were caused by FOD. See Atch 3 for details of remaining power losses.

2. Inspection of on-board aircraft revealed conditions reflecting inadequacy of organizational maintenance. Specific discrepancies found in the transmission pylon area which could be potential FOD hazards were as follows:

a. Missing chafing strip on cowl faring.

b. Transmission oil lines chafing on support rod.

c. Torn and missing transmission electrical harness tubing.

d. Lube tank hold-down strap (cork) deteriorated.

e. Safety pin on cowl support frame track loose. Another was wrapped with safety wire.

f. Cowl support rod broken.

g. Indentification tape on transmission oil line loose.

h. Missing cowl chafing strip on cabin.

i. Forward firewall seal worn and metal core chafed.

j. Baffle assembly side door cracked and rivet missing.

k. Nutplate rivet missing on baffle assembly.

l. Hand tools left on work deck when no maintenance being performed.

m. Safety wire improperly used to secure cowl support frame track.

n. Discarded safety wire in transmission area.

o. Seal missing on transmission cowl.

p. Although available, bell-mouth inlet plugs were not being used by the 20th SOS during maintenance actions.

3. Tail boom skin cracks were found on two aircraft: 63-13150 and 63-13165, at station 194. Cracks approximately 6" and 3" in length.

4. A review of Sep 69 WRAMA/OCAMA/GE assistance team recommendations to determine extent of accomplishment revealed the following:

a. Recommendations relative to sealing off air intake area by replacing/repairing defective seals, baffle components, cowl and cowl support frames is being accomplished. Several aircraft had new barrier filters installed.

b. Proper bonding of filter seal P/N 204-060-286-1 was being accomplished.

c. Sufficient hell-hole covers on hand for use on all operational aircraft. Unit was short five covers.

d. Most recommendations relative to engine maintenance and inspections are of a continuing nature and are being accomplished.

5. Inspection of six installed T-58-3 engines revealed the following:

a. The top compressor casings were removed from six installed engines on 10 and 11 Nov 69, to determine condition of the compressors.

(1) Engine 279-012 in aircraft 63-13146 had 82.2 hours since installation. There was very slight erosion on stage 1 rotor blades but no FOD. Also, there was a moderate build-up of oil and dirt throughout the compressor with the heaviest build-up (approx 0.010 inch) in stages 1-4. Water Wash/Rust-Lick had not been accomplished since aircraft was last flown on 5 Nov 69.

(2) Engine 279-213 in aircraft 63-13150 had 65.8 hours since installation. There was no erosion or FOD. The compressor was very clean and coated with Rust-Lick evidencing that Water Wash/Rust-Lick had been accomplished in accordance with 2J-T58-2 requirements.

(3) Engine 279-224 in aircraft 63-13161 had 101.7 hours since installation. There was very light FOD on rotor blades and stator vanes in stages 3 through 8, i.e., one rotor blade in stage 3, one rotor blade in stage 4, three rotor blades and four stator vanes in stage 6, two rotor blades and one stator vane in stage 7 and two rotor blades in stage 8. This FOD was within serviceable limits. The compressor had a very heavy build-up of oil and dirt throughout with 0.020 - 0.025 inch build-up in first five stages. Water Wash/Lick had not been accomplished since aircraft was last flown on 7 Nov 69.

(4) Engine 279-209 in aircraft 63-13162 had 70.5 hours since installation. There was no erosion or FOD. However, there was a very heavy build-up of oil and dirt throughout the compressor comparable to that on engine 279-224 as listed above. Also, Water Wash/Rust-Lick had not been accomplished since aircraft was last flown on 5 Nov 69.

(5) Engine [illegible] in aircraft 63-13159 had 37.5 hours since installation. Compressor was relatively clean with only traces of oil on first four stages. There was very light erosion on stage 1 rotor blades but no FOD. Water Wash/Rust-Lick had not been accomplished since aircraft was last flown on 8 Nov 69.

(6) Engine [illegible] in aircraft 66-7927 had 40.9 hours since installation. There was no FOD or erosion. There was a slight build-up of oil and dirt throughout the compressor. Rust-Lick had been applied but the Water/Dry Cycle had not been accomplished in accordance with 2J-T58-2 requirements prior to Rust-Lick application.

6. A visit to the 20th SOS forward operating location determined the following:

a. Taxi and revetment areas were composed primarily of laterite treated with perma-seal. Laterite was in final stages of decomposition. Entire area contained unlimited FOD potential.

b. Housekeeping in the maintenance area was completely unacceptable. Any resemblance of organization was completely lacking. All replacement parts and tools were covered with dust and sand. Open boxes, tools, T.O.'s, parts, bits, and pieces were jumbled together.

7. Review of thirteen (13) month engine removal data provided the following information:

a. Total engines removed - [illegible]

b. Total engines removed for FOD - 46

c. Total engines removed for erosion - 13

d. Total flying hours - [illegible]

e. FOD removals per 1000 flying hours - 3.61

f. FOD removal per 1000 flying hours for CONUS operating units - 1.0

8. An inspection of the 20th SOS Bench Stock area at Tuy Hoa revealed very limited control and organization. Parts were not organized in any semblance of order. Bits and pieces were strewn, protective packaging torn open and missing.

9. A review of engine shop and engine tech data provided the following information:

a. Personnel assigned to the Engine Shop are impressive in their attitudes to learn and perform proper maintenance. The engine T.O.'s are well used, and the Tech Rep has had many solid questions asked during OJT and formal training sessions.

b. The key to this organization's growth is the Engine Conditioning program in the shop, followed by performance proofing in the Test Stand and follow through trouble-shooting and conditioning in the aircraft. No additional recommendations other than the Phase III document are in order. At present there are eight (8) serviceable spare engines, all of which exceed new production/overhaul specification shaft horsepower requirements.

10. A review of 20th SOS manning was conducted.

11. A review of Accident Board personnel composition revealed Squadron Operations Officer assigned as president of the board.

12. A review of fuel contamination problem at 20th SOS revealed the following:

a. Fuel control removals due to fuel contamination have been a serious problem with the 20th at FOL's during the past 8-9 months. Fuel in the last four (4) aircraft which returned from BMT showed contamination in aircraft No's. 63-13146 and 63-13162. Results of local POL lab show contamination as follows:

Solids - Max Allowable = 8.00 mgm/gal

#146 had 26.55 mgm/gal
#162 had 19.30 mgm/gal

Aircraft fuel filters were "filthy" according to report from Tuy Hoa POL specialists.

13. A review of 20th SOS maintenance facility at Tuy Hoa revealed the only hanger facility available is that space borrowed on a time to time basis from host base. 20th SOS's maintenance building is under construction.

14. A review of the 1H-1(U)F-1 flight manual revealed the following problem:

a. Engine power available - There is no useable means of determining maximum power available from an engine before or at the start of a mission. This is because the maximum power available chart in the flight manual is for hover, and at the low altitudes of the bases at which the aircraft are stationed, the aircraft does not require maximum power to hover. In addition to having no useable means of determining maximum power available, no means is available to reject an engine based on low power considerations.

b. A check is presently included in the flight manual which outlines an inflight method of recording certain engine and atmospheric parameters, and provides a graph for plotting this information. The accuracy of this check is hindered by the size, graduations, and accuracy of the instruments, in conjunction with the small size of the

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graph on which the data is plotted.

c. In addition two errors in the 1H-1(U)F-1 were also pointed out as follows.

(1) RPM droop is not specified in topping check.

(2) Maximum gross weight to hover charts must be corrected for calculation error.

d. Discussion with the 20th resulted in the following:

(1) Instructions and data have been generated which will allow a pilot to correct the values in the flight manual from hover to climb. This check can be accomplished at the start of a mission. These corrections/instructions and authorization for their use have been left with the 20th SOS. (See Atch 5). In addition, a chart will be drawn up including those losses and thereby simplifying the method of determining if the engine in an aircraft is above or below minimum specification performance.

(2) To partially relieve the problem of inaccuracy in the power deterioration check, a larger graph was drawn up and given to the 20th SOS. In addition, another means of checking power deterioration is being investigated which could provide a simpler and more accurate check.

15. Discussions were held between WRAMA Team Chief and Command Representatives of 7AF, 14SOW, and 31FMS.

Recommendations:

1. An extraordinary FOD inspection effort is a must for this organization. Proper supervision and management of this effort is mandatory. (Action 20th SOS/14SOW/31FMS)

2. Recommend flight line personnel be issued and wear only the jungle boot having the non-FOD designed sole. This boot should reduce the amount of debris deposited on aircraft work decks during maintenance/inspection. (Action 20th SOS/31FMS)

3. Engine inlet covers should be religiously used during flight line maintenance. (Action 20 SOS)

4. Maintenance standards in and around the air inlet, baffle assembly, transmission pylon area and cabin work deck must be improved to eliminate the possibility of FOD from these areas. Additional recommendations that should reduce FOD susceptability are:

a. 7th Air Force direct the immediate completion of the maintenance facility to provide a cleaner work area for performing organizational maintenance. (Action 7th AF)

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b. Standardization of maintenance practices should be reviewed. Aircraft inspected revealed much improvement required in this area. (Action 20 SOS/31FMS)

c. Fuel facility at FOL must regularly be inspected by POL experts eliminate fuel contamination being experienced in these air-craft. The possibility of experiencing power losses due to fuel contamination must be eliminated. (Action 20 SOS)

d. Due to the importance of first class maintenance/inspection at the FOL, recommend a maintenance officer be assigned to that facility. (Action 20th SOS)

e. Recommend facility improvement at FOL. Realizing that FOL conditions are primitive, every effort should be made in general area housekeeping. (Action 20 SOS)

f. The water wash/Rust-Lick application for compressor cleaning and corrosion prevention is not being accomplished in accordance with requirements of T.O. 2J-T58-2, paragraphs 3-27 and 3-28. Recommend these procedures be rigorously applied since they are a necessity in maintaining engine condition. (Action 20 SOS/31FMS)

g. Recommend close and continuous inspection of tail boom in vicinity of station 194 to identify any existing cracks. (Action 20 SOS/31FMS)

5. Design Improvements

a. The team recognizes the urgent need for improvement in the air intake area to reduce possibility of foreign object damage from exterior sources. A particle separator similar to that presently being used by the Army will receive every consideration by the System Manager. Command revalidation of this requirement as mission essential is necessary prior to further WRAMA action. (Action PACAF/WRAMA)

b. Engineering projects are already established and in work on possible modification of baffle assembly to reduce or eliminate hole around short shaft, plus redesign of barrier filter to provide a field repairable assembly. (Action WRAMA)

6. Engine Performance Data: T.O. 1H-1(U)F-1 Flight Manual.

a. It is recommended that 7AF, in conjunction with the 14 SOW determine the minimum engine power needed to meet mission requirements and authorize the 20th to use this as a standard for rejecting engines. It is further recommended that ASD (ASZTH) be given this information so a maximum power available for reject chart can be made.

b. ASD will correct the two errors identified in "Conclusions", 14r above.

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7. 7AF Phase III Recommendation:

a. Recommendation proposed in the 7AF Phase III package will be expeditiously evaluated upon receipt at WRAMA. (Action PACAF/WRAMA)

8. It is recommended that 7AF consider an expedited input of aircraft to the current Depot Maintenance Program at ARADMAC. This element was discussed in detail by the Team Chief and 7AF/DMM. (Action 7AF)

All team members have reviewed the above report and concur in conclusions and recommendations.

MAYNARD H. RHOADES, Colonel, USAF
Team Chief

5 Atch
1. Team Personnel.
2. Phase Two Actions.
3. Mishap Records.
4. Engine Removals.
5. Max Power.

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TEAM COMPOSITION

NAME	FUNCTION
Col M. Rhoades	Chief, Helicopter/Utility Acft SM Division (WRAMA)
Lt K. Mathews	System Manager, H-1 Helicopter (WRAMA)
Lt C. Soderberg	Service Engineering (WRAMA)
H. Rounds	Bell Field Service
J. Wellborn	G.E./T-58 Engine Manager
B. Tabor	Engine Technician (OCAMA)
B. Eder	Aerospace Engineer (ASD)
A. Scott	H-1 Aircraft Technician (WRAMA)

Atch 1-1

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PHASE TWO INSPECTION

Soap Sample Required

Inspect and Clean Fuel Filters

Inspect and Clean Oil Filters

Inspect Magnetic Drain Plugs

Inspect and Lubricate Power Turbine Flex Shaft Core and Housing

Inspect Fuel Pump Coupling Male/Female Splines Per T.O. 2J-T58-529 Lube and Repack Male Splines

Inspect Starter IAW T.O. 1H-1(U)F-2-1, Section 5, Para 5-139(a) Inspect Housing/Hot Spots

Reindex Variable Vanes Per T.O. 2J-T58-2, Para 5-213 Through 5-216

Perform Water/Wash Rust-Lick Application Per T.O. 2J-T58-2

Perform Ground Operation-Engine Conditioning Per T.O. 1H-1(U)F-2-2

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REVIEW OF ACCIDENT AND INCIDENT REPORTS UH-1P

Incident	27 Aug 68	UH-1 65-7939. FCF for engine change and throttle adjustment. Seven minutes hover check performed and climbed to 500 feet. At 60 knots vertical heavy jar was felt and an audible boom heard. Autorotated into a rice paddy. Engine continued to run at flight idle but at 1600 RPM all gauges normal except TIT was 560 degrees. Found FOD to first two stages of rotor blades.
Incident	6 Dec 69	UH-1 65-7491 FCF. Engine failed during topping check at 800 feet at 98%, TIT 660. FOD first two stages.
Incident	25 Mar 69	UH-1 63-13158. Autorotated when engine quit. Rod broken. Replaced IGV assembly.
Accident	26 Mar 69	UH-1 63-13158. Crashed. Witness in aircraft stated engine quit and rotor started flapping. Aircraft crashed and burned. Board found rotors cut boom off. Examination of gauges after accident showed TIT stuck between 800-900 and dual tach needles split.
Incident	28 Mar 69	65-7929. FOD. Message 010553OZ Apr 69.
Incident	10 Apr 69	UH-1 63-13146. Engine drive fuel pump failed. Message 151017Z Apr 69.
Incident	14 Apr 69	3162. FOD. Message 142309Z Apr 69.
Incident	10 May 69	163 Engine failed on FCF. Found "O" ring seals chewed up in fuel pump filter restricting flow. Message 150728Z Mar 69.
Incident	15 May 69	65-7925. Engine quit. Auto-rotation. Fuel control.
Accident	19 May 69	151. Crashed 19 May. Engien disassembly disclosed minor FOD through all stages. Message 280133Z May 69.
Incident	19 May 69	63-13346. Engine quit. Fuel control.
Incident	31 May 69	3155. FOD (Data Plate). Message 021020Z Jun 69.
Incident	12 Jun 69	63-13156. Flame out - autorotated. Engine restored-returned to base. Engine had minor FOD. Power failure. Message 120830Z Jun 69.

Incident	13 Jul 69	929. Lost power bearing rod end on variable stator actuator failed, stators went or remained at a position close full closed. Pilot was going into Duc Co and when he pulled in collective lost turns on rotor during approach.
Accident	14 Jul 69	929. FCF - lost power during topping check - aircraft crashed. Engine given test cell run, and failed stall **check**. Variable stators adjusted beyond tech order limits.. Stators adjusted per Tech Order and stall check OK.
Accident	19 Jul 69	930. Crashed on take off. Pilot heard loud bang, FOD to the compressor, air seal missing from right hand inlet filter door assy.
Accident	25 Aug 69	217. Pilot alledged that engine lost power during FCF. Compressor had gross FOD to the inlet guide vanes and four 1st stage compressor blades. Damage similar to A/C 930, but more severe.
Incident	29 Aug 69	476. Had RPM warning horn momentarily during hover prior to take off, continued take off and got the horn again at 30 KIAS, torque dropped 7 PSI. Found approx 8 inches of electricians tape across inlet guide vanes.
Incident	29 Aug 69	931. Engine would not start, found hole burned through starter fairing, FOD to engine.
Incident	31 Aug 69	927. Just after take off experienced compressor stalls, found hole burned through starter fairing FOD to engine.
Accident	8 Oct 69	156. Crashed on landing. Pilot heard a popping noise. Suspect flt control, material failure.
Accident	~~23~~ 21 Oct 69	155. Eng failed in flt. Suspect FOD. Pilot successfully autorotated on landing. Rt skid collasped on touchdown. (Tailwind). Aircraft destroyed by fire.

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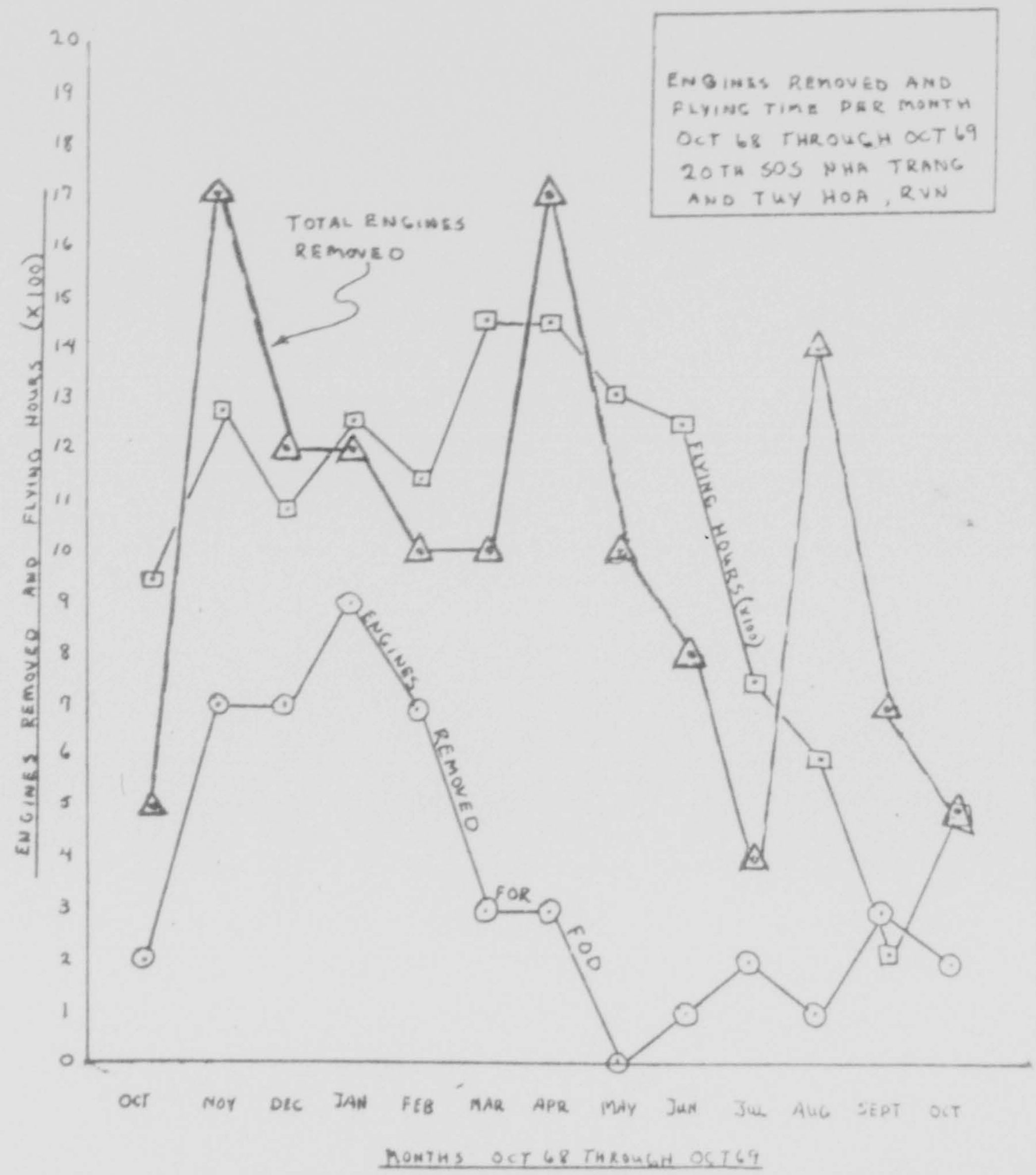
ENGINES REMOVED AND FLYING TIME PER MONTH OCT 68 THROUGH OCT 69 20TH SOS NHA TRANG AND TUY HOA, RVN
TOTAL ENGINES REMOVED
FLYING HOURS (X100)
ENGINES REMOVED FOR FOD
ENGINES REMOVED AND FLYING HOURS (X100)
20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEPT OCT
MONTHS OCT 68 THROUGH OCT 69

ATCH 4-1

Maximum Power Available in a Climb

A. To determine the maximum power available from a specification engine in a climb, the following steps must be performed.

1. Determine the maximum power available from figure A-5 in T.O. 1H-1(U)F-1 for the desired atmospheric conditions.

2. From this value subtract the following appropriate number. (This number is the loss due to the inlet filter. It is not the difference between doors open and doors closed).

Subtract	if the attitude between
3.5 PSI	1000 and 4000 ft.
3.25 PSI	4000 and 8000 ft.
3.0 PSI	8000 and higher

3. Next, subtract the following number from the value obtained in Step 2.

Subtract	if the torque from step 2 is between
1.0	0 and 40 PSI
1.5	40 and 55 PSI
2.0	55 and higher

4. The resulting value is the maximum power output of a specification engine in a climb at 60 knots indicated airspeed.

B. To determine the maximum power available from the engine installed in the helicopter proceed as follows.

1. Establish steady state level flight at 60 knots indicated airspeed, filter doors closed, 6400 engine RPM. Set the barometer scale to 29.92 to read pressure altitude. Increase collective to initiate climb maintaining 60 knots indicated airspeed. Continue increasing collective until reaching a limiting Ng, TIT, or until RPM drops to 6200 RPM. Read OAT, pressure altitude, and torque.

2. Apply the torque signal correction placarded on the instrument panel to this value.

3. The resulting number is the maximum power available from the engine installed in the helicopter in a climb at 60 knots indicated airspeed.

C. To determine if the engine output is above or below a specification engine, compare A and B above. If the corrected value from flight (B) is higher than the corrected value from chart A-5 (A) at the same pressure altitude, OAT, and RPM; then the engine maximum power available is above specification. If the corrected value from flight (B) is lower than the corrected value from chart A-5 (A) then the engine maximum power available is below specification.

The above information is on an intermediate basis. A chart, in the format of figure A-5, will be drawn up and forwarded to the 20th SOS. This chart will include the losses of steps A2 and A3.

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS OKLAHOMA CITY AIR MATERIEL AREA (AFLC)
TINKER AIR FORCE BASE, OKLAHOMA 73145

NDTAB
AJH

OCMTT 08 OCT 1969

UH-1P Helicopter Engine Problems

AFLC (MCMP)
Wright-Patterson AFB OH 45433

Reference your letter dated 1 October 1969. Attached is a report of findings and corrective action taken by the OCAMA representative regarding subject problems.

FOR THE COMMANDER

HOWARD D. DIXON
Chief, Technical Svs Branch
Engine Item Mgt Division
Directorate, Materiel Management

1 Atch
T58 COSMAT Report (2 cys)

Cy to: WRAMA (WRNDT)
Robins AFB GA 31093

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T 58 COSMAT REPORT

(Combat on Site Maintenance Action Team)

TUY HOA AB RVN

1. The GE T 58 Cosmat Team and representatives from OCAMA/WRAMA assembled at Tuy Hoa on 9 Sep 1969. The team discussed current difficulties with the Chief of Maintenance and staff. An airframe/engine inspection and a review of engine records was accomplished and the following program was formulated:

a. Pre-Run Engine Checks

(1) Pull fuel control

(a) Inspect fuel pump front coupling male/female splines per TCTO 2J-T58-529C.

*(b) Lubricate and repack male spline.

*(2) Inspect/lubricate power turbine flex shaft core and housing.

(3) Re-index variable stator vanes per T.O. 2J-T58-2.

*(4) Pull magnetic plugs.

*(5) Inspect and clean fuel/oil filter.

(6) SOAP

*Accomplish these items per Aircraft Phase Work Cards

b. Water wash/rustlick application per T.O. 2J-T58-2.

c. Power Plant Ground Operation and Conditioning per T.O. 1H-3-(U)F-2-2 (Tie down checks)

d. Engine in flight check per FCF manual.

2. An aircraft tie down tool and ground tie down facility was provided by 31th FMS for the ground operation and conditioning phase of the program. The tie down facility represents a significant improvement in the maintenance capability of both the engine shop and flightline. Engines are effectively conditioned and airframe throttle rigging problems corrected during tie down. Many maintenance manhours will continue to be saved in the future with the benefit of assuring proper engine operation prior to flight.

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[illegible]. Engine power deterioration baselines were established for each aircraft during the PCP. The baseline serves as a means of monitoring engine power/stall margin depreciation during operation thus affording a valid, rejection criteria and aiding troubleshooting.

[illegible]. Attached is [illegible] of the recommendations offered and action taken to [illegible] current problems and provide continued satisfactory operation. The [illegible] and the [illegible] have concurred with the recommendations and pro[illegible] excellent [illegible] in implementing all actions.

[illegible]
[illegible] Electric [illegible] Representative
[illegible] Service Engineering [illegible]

1 atch
Problem/Significance
Recommendations

[illegible] Contractor Field [illegible] Representative

[illegible] I. FINLEY
[illegible] Representative
[illegible]

T58GE3/UH-1P COMMAT RECOMMENDATIONS
(Combat on Site Maintenance Action Team)
TUY HOA AB RVN

FOD

PROBLEM/SIGNIFICANCE

[illegible] FOD has [illegible] engine power losses and produced unscheduled maintenance action. The T58GE3/UH-1P installation is particularly susceptible to [illegible] of debris hidden in the engine intake area. [illegible] visual [illegible] may overlook potential sources of FOD. [illegible] and the plenum chamber area have [illegible] the engine intake.

RECOMMENDATIONS

1. Implement [illegible] inlet inspection checklist for the UH-1P aircraft. 20th SOS - Action complete.
2. Revise T.O. 1H-1(U)F-2-[illegible] to incorporate checklist. GE/SAAMA Next revision.
3. Design [illegible] for aircraft inlet inspection. 20th SOS - Action complete.
4. Install [illegible] inlet covers in aircraft to prevent entry of external debris. 20th SOS [illegible].
5. Review current inlet configuration for possible improvements. SAAMA-in process.
6. [illegible] FOD prevention - FOD booklet distribution. GE Rep - continuing.
7. Procure FOD [illegible] - Expedited by GE upon receipt of [illegible] base requisition number.
8. Analyze [illegible] damage to identify object ingested to preclude [illegible] incidents. GE Rep - continuing.
9. Revise aircraft [illegible] cards to include criteria for inlet [illegible] and institute cleaning of intake area. 20th SOS/ GE - In process.
10. Provide protective covers for engine inlet during aircraft transmission maintenance. 20th SOS - In process.

COMPRESSOR EROSION

PROBLEM/SIGNIFICANCE

Severe environmental conditions have subjected compressor [illegible] to sand erosion. The erosion of first/second stage compressor blades has affected the aerodynamic performance of the airfoils resulting in a decrease in engine power available and stall margin. The current UH-1P barrier filter does not provide sufficient erosion protection.

RECOMMENDATIONS:

1. Install dust covers to protect variable assembly. 31 FMS to order -
GE expedite.
2. Monitor engine power deterioration charts to preclude compressor stalls.
20th SOS - continuing.
3. Replace eroded compressor blades to provide optimum engine performance
and stall margin. 31 FMS/GE/OOAMA. In progress.
4. Provision first/second stage compressor rotor blades as bench stock
items. 31 FMS/OOAMA. In progress.
5. Procure tooling to permit blade replacement. 31 FMS to order - GE ex-
pedite.
6. Utilize stall margin check during aircraft tie down operation. 31 FMS/
OOAMA. In process.
7. Revise T.O. 1H-(U)F-2-2 to incorporate stall check. WRAMA/GE. Next revision
8. Review current inlet configuration for possible improvements in FOD/
erosion protection. WRAMA - in progress.

CONTAMINANT FOULING

PROBLEM/SIGNIFICANCE

Oil leakage from aircraft systems permits oil accumulation in the engine plenum chamber. Subsequent oil ingestion during engine operation bakes on blades/vanes reducing engine power and stall margin. In addition, extended hover operations may cause exhaust gas ingestion producing carbon build up on the backside of the blades/vanes.

RECOMMENDATIONS:

1. Institute water wash/rust inhibiting procedures per T.O. 2J-T58-2/20th SOS -
complete.
2. Utilize Q.C. for spot checks to assure compliance with proper procedure.
31 FMS. In process.
3. Monitor removed engines for effectiveness of cleaning procedures. GE
Rep continuing.
4. Correct all oil leaks near intake area and clean plenum chamber. 20th
SOS continuing.

MAINTENANCE - ENGINE SHOP

PROBLEM/SIGNIFICANCE

Previous lack of an aircraft tie-down facility and engine conditioning program at Nha Trang AB permitted engine problems to remain undetected. The severe operating environment requires precautionary maintenance practices for continued satisfactory engine operation. Insufficient background and knowledge of engine operation hampered effective troubleshooting and caused unnecessary parts replacement and expended manhours.

RECOMMENDATIONS:

1. Utilize aircraft tie-down facility for engine troubleshooting and con-

oitioning. 31 FMS - Complete.
2. Organize engine conditioning teams to analyze engine operation. 31 FMS - Complete.
3. Research T 58 tooling inventory and procure as required. 31 FMS - GE expedite upon receipt of off Base requisition numbers - in process.
4. Conduct daily training on T 58 engine. GE Rep/Wing Training - in process.
5. Provide T 58 programmed instruction. GE - in process.
6. Provide revised flightline troubleshooting guide for installed engine operation. GE - in process.
7. Simplify engine tuning procedure. GE/OCAMA - in process.
8. Develop T 58 engine conditioning log sheet. GE - complete.
9. Incorporate T 58 log sheet in T.O. 1H-(U)F-2-2. GE/SAAMA. Next revision
10. Order sufficient T.O.'s for personnel useage. 31FMS/20th OOS - Complete.
11. Train personnel for test stand operation/maintenance. 31 FMS/GE Rep in-process.
12. Engine Shop personnel perform engine maintenance on flightline. 31 FMS - Complete.

MAINTENANCE - FLIGHTLINE

PROBLEM/SIGNIFICANCE

Insufficient knowledge of engine operation contributed to ineffective troubleshooting of engine problems. Improper engine adjustment and uncalibrated aircraft instrumentation prevented discovery of engine difficulties. Airframe/engine throttle rigging procedures are complicated and difficult to follow in the existing Tech Data causing large expenditures of maintenance manhours.

RECOMMENDATIONS:

1. Conduct training on engine operation and troubleshooting. Wing Training/GE Rep in process.
2. Revise T.O. 1H-(U)F-2-1, Engine Throttle Rigging Instructions. GE in process.
3. Implement power deterioration checks. 20th OOS in process.
4. Assure Q.C. personnel are properly trained to inspect known problem areas. GE/Wing Training In Process
5. Provide simplified flightline troubleshooting guide for installed engine operation. GE - in process.

LOGISTICS

PROBLEM/SIGNIFICANCE

Higher unscheduled removal rates associated with combat and severe environmental conditions increase the requirement for parts and spare engines. Transportation delays and long pipe lines to the depot increase turnaround time. Movement of the maintenance facility reduced short range

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[illegible] capability and produced a need for additional spare engines. Rejection of engines for low indicated T 58 signals further reduced the spare engine level.

RECOMMENDATIONS:

1. Assure proper parts packaging to prevent damage. GE/OCAMA continuing.
2. [illegible] parts stock levels. GE/OCAMA/31 FMS in process.
[illegible] M- complete.

PILOT TRAINING

PROBLEM/SIGNIFICANCE:

[illegible] that pilots provide detailed [illegible] and maintenance per- sonnel [illegible] and correcting airframe/engine malfunctions. Pilots must [illegible] adequate background for "cockpit analysis".

RECOMMENDATIONS:

1. Provide literature concerning engine operation/performance in the UH-1P in- stallation. GE - in process.
2. Distribute booklets "Malfunction analysis from the cockpit" GE Rep in process
3. Assure understanding and proper utilization for power deterioration checks, max power available charts, and SDG accuracy check. GE Rep continuing.
4. Institute Ng/T5 relationship check. 20th SOS/GE - complete.
5. Provide instructions for engine/airframe operation [illegible] shutdown. 20th SOS/GE - complete.

MISSION POWER REQUIREMENT

PROBLEM/SIGNIFICANCE:

Mission requirements dictate engine operation [illegible] power levels. En- gines processed in the JEIM facility must provide [illegible] power and still maintain [illegible]. Inability of the mobile test stand to [illegible] engine power output had [illegible] doubts concerning the performance of installed engines. Engines currently assembled/tested by the shop must meet model specification limits.

RECOMMENDATIONS:

1. Rectify mobile test stand problems - GE continuing
2. Utilize mobile test stand to analyze engine performance. 31FMS complete.
3. Provide torque rejection limit (minimum mission requirement) for pilots/ maintenance. 20th SOS/GE complete.

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4. [illegible]ck engine parts essential for maximum power. OCAMA/[illegible]. In process
5. Define causes of low power engines. GE Rep - in process.

FUEL CONTAMINATION

PROBLEM/SIGNIFICANCE

[illegible] forward [illegible] airframe/engine fuel [illegible] possible [illegible]. Contamination of the fuel control or pilot [illegible] may cause engine malfunction or power [illegible]. Silt like material has been [illegible] in the [illegible] purifier and airframe fuel filter. Since fuel control filter by-passing [illegible] visually [illegible], engine malfunction is not predictable.

RECOMMENDATION

1. Calibrate/install Delta P fuel control filter [illegible]. [illegible]/GE in process.
2. Install ultrasonic filter cleaner. [illegible] in process.
3. Inspect fuel system filters every 25 hours. 20th [illegible] in process.
4. [illegible] aircraft filter by-pass warning light [illegible]. 20th [illegible]
5. Monitor forward refueling operations for contamination 20th [illegible]

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Projected Engine Shop Training Requirements

1. T58 Programmed Training Books 1 & 2 (GE to supply)
2. Engine/SDG Familiarisation (Training Manuals supplied)
3. Engine/SDG Operation (Training Manuals same as 2)
4. Build-up/Teardown Techniques
5. Engine Conditioning T.O. 11-(U)F-2-2
6. Engine/SDG Trouble-shooting

Projected Flight Line Training Requirements

1. Engine/Aircraft Throttle Rigging Procedures
2. FOD Prevention/Inlet Inspection (FOD Booklets provided)
3. Water/Wash/Rustlick Procedures

Projected Pilot Training Requirements

1. FCF Procedures and significance
2. Malfunction Analysis from the cockpit (GE to supply booklets)
3. Classroom instruction as required

The above training requirements have been coordinated with the Wing Training facility. Instruction to begin upon receipt of Programmed Instruction Booklets. Training to be conducted by B. M. Fate, GE contractor Field Services (CFS)

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16 SEP 1969

FROM: WRAMA Representative, UH-1P Area Support Team
APO San Francisco [illegible]

SUBJECT: Field Report, UH-1P Helicopter

TO: [illegible]

Purpose of trip: Inspect and evaluate airframe oriented FOD problems on UH-1[illegible].

Findings: An inspection was accomplished on the air inlet/barrier filter/sealing areas of eight of the UH-1P aircraft on station. Findings were as follows:

a. Much work had apparently been accomplished recently in an attempt to close off some to the air gaps around the inlet area. This was apparent from the new seals or re-bonded seals found on the aircraft.

b. Some aircraft still had air gaps which could be reduced or eliminated completely through replacement or re-setting of seals or replacement or repair of baffle assembly components (perferably replacement). Transmission cowl replacement may be required in addition to above seal and baffle assembly components replacement on some aircraft to adequately seal the area.

c. Right and left hand door panel assemblies, P/N 204-062-212-[illegible] and 204-062-213-[illegible] respectively, were damaged on several aircraft. These panels form part of the air basket sealing surfaces.

d. Hell hole covers were not installed.

e. Short shaft opening in baffle assembly was checked and measured at 3/4 inch.

f. Barrier filters were inspected for condition of seals, cleanliness and general condition of foam screen segments. None of the filters inspected appeared to be excessively dirty. Seal P/N 204-060-286-1 located top of right and left hand filter assemblies, were loose on some aircraft. This seal is located such that, should it come loose, FOD is probable.

g. Transmission cowling support frames, rollers, tracks were in need of repair on some aircraft. Rollers were missing, tracks loose, clevis rod ends bent.

Recommendations:

a. Replace or adjust all necessary seals around air intake area needed to properly close off air gaps.

b. Replace those baffle components damaged/bent to extent of cracking or that do not provide close fitting to cowling when closed.

c. Insure adequate bonding of those seals requiring bonding to prevent [illegible], with special attention to bonding of seal P/N 204-060-286-1.

d. Where replacement/adjustment of seals and baffle assembly components do not provide adequate sealing to cowling mating surfaces, cowling should be checked for possible replacement.

e. Install and operate with hell hole covers installed. This should reduce amount of foreign material picked up in this area that could reach the air baffle area.

f. Insure adequate inspection and cleaning of barrier filter assemblies to insure sufficient air flow through filters. Clogging of filters increases air flow through short shaft opening plus any other openings in air baffle area and increases danger of F.O.

g. Insure adequate maintenance of transmission cowl support frames and attaching hardware to preclude possible F.O. from these items plus provide adequate handling and securing of cowl assemblies.

h. Short shaft opening in baffle assembly. Possibility of closing or reducing size of this opening must be based upon results of proper engineering evaluation. A material improvement project [illegible] was established at [illegible] 14 SOW [illegible] dated [illegible] Sep 68, that identified this opening as a possible FOD entry point. Additional information gathered during this trip relative to operating [illegible], environmental conditions and operational requirements should provide additional justification for exerted effort in arriving at a workable solution. Information on WRAMA engineering evaluation will be provided as soon as obtainable.

General Maintenance Comments: Based upon age of these aircraft, flying hours and operating environment, general overall maintenance appears to be adequate. [illegible] records reviewed on the aircraft were adequate.

At the request of Colonel [illegible], 31 Chief of Maintenance, Lt. Colonel [illegible], [illegible] Quality Control [illegible] and Major Stevenson, Lt. Colonel Burks [illegible], the following information is provided relative to known past problem areas and recommended increased inspections for the 20 SOS, UH-1P [illegible] over and above those outlined in the -6 inspection requirements for [illegible] UH-1 fleet.

a. Tail Rotor Hub: Failure of end of yoke where grip retaining nut attaches and is safetied w/cotter pin. Present inspection requirement adequate for UH-1F. Insure [illegible] and special inspection requirements are rigidly inforced and hub condemned at 1200 hours IAW replacement schedule Part IV.

b. Tail Rotor Drive Shaft Hanger Coupling and 42° and 90° Gear Box Couplings: Failure of splined coupling from lack of lubrication. Present lub and inspection requirements adequate. Insure accomplishment of inspection and lub plus TPO requirements. Note - Also recommend inspection of 42° and 90° gear box splined coupling upon receipt from supply and prior to installation on aircraft.

c. Tail Boom Attachment Points: Attachment fittings on aft fuselage bulkhead, station [illegible]: Recommend inspection at same frequency as inspection of attachment bolts, for elongation of attachment rivet holes, chafing or other indication of looseness.

d. Airframe Fuel Filter: No inspection requirement deemed necessary for total fleet due to incorporation of impending by-pass warning which cautions aircrew prior to actual filter by-pass condition. The total fuel filtering capability, which also includes the static filter, fuel pump filter and centrifugal purifier, does not justify the present 2[illegible] hour filter replacement schedule being accomplished by the 20 SOS. Recommend going to 50 hours replacement unless this frequency is found to be too great to prevent activation of impending by-pass system.

e. Pillow Block Assy: Major problem is oil leakage and casting failure at point of engine front frame attachment. Repair restrictions do not prohibit field replacement of any pillow block components with exception of fireshield and uni-ball bearing. Recommend seal replacement as necessary to prevent leakage. Care in engine removal/replacement can reduce casting failures.

f. Lubrication Requirements: Due to 20 SOS environmental operating conditions, recommend close inspection of all flight controls, main and tail rotor, mast mounted and anti-torque, for adequacy of present lub requirements. Most are presently lubricated at the 100 hour interval. Proper inspection at time of disassembly should verify adequacy of this lub frequency.

g. PPO Inspection Requirements: Recommend instruction outlined in introduction to both 1H-1(U)F-6WC-1PRPO and 1H-1(U)F-6WC-1PH relative to accomplishing all PPO inspection requirements in conjunction with or after each phase inspection be followed.

h. Hell hole cover: Recommend an added local inspection requirement to Part [illegible] of the BPO requiring inspection for any foreign material which may be lodged on top of cover or other ledges within area.

Summary: A strictly enforced and closely monitored maintenance/inspection program cannot be overemphasized on the UH-1P Helicopter, especially under the present operational condition and environment. The Commander and Maintenance Officer are encouraged to increase any inspection interval or scope found, through operating experience, to be essential for the safe and thorough maintenance/inspection of their aircraft. Quality Control should insure all required inspections are adequately accomplished IAW T.O. requirements plus any local requirements. Only through such a maintenance/inspection program will the UH-1P adequately perform. WRAMA/WRNDT will assist any way possible on any maintenance/inspection problem which may arise, plus any tech data deficiencies found in WRAMA managed UH-1P handbooks. AFTO Form 22's should be forwarded to WRAMA/WRNSTA. Technical problems should be forwarded to WRAMA/WRNDT.

ASTOR F. SCOTT
Equip. Specialist (Acft)
WRAMA/WRNDT/2540

Cy to: 7AF/DMM
20 SOS/MO
31 TFW/DCMMQ

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Ground Electronic Engineering Installation Agency

TITLE *(Use one)* *(DO NOT USE IF TITLE IS MAIN ENTRY)* (150AN)

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ANNUAL HISTORY

OF

PACIFIC GEEIA REGION

1 JULY 1968 - 30 JUNE 1969

Prepared By
Captain Thomas R. Howes
Plans and Management Office
Pacific GEEIA Region

Approved By:

ORVILLE K. REILLEY, Colonel, USAF
Commander
15 August 1969

GROUND ELECTRONICS ENGINEERING-INSTALLATION AGENCY
AIR FORCE LOGISTICS COMMAND

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FOREWORD

This document is the history of the Pacific GEEIA Region for fiscal year 1969. While this completes GEEIA's eleventh full year of operation, the end of this reporting period marks completion of ten years activity for this Region.

The Region activity takes in all of the Pacific, including the Headquarters in Hawaii, the 2875th GEEIA Squadron in Japan, the 2876th GEEIA Squadron in the Philippines, the 483rd GEEIA Squadron in Thailand, and the 485th GEEIA Squadron in South Vietnam.

Two Detachments were also assigned in the Region, they being Detachment 4, Pacific GEEIA Region, in Hawaii and Detachment 2, 2875th GEEIA Squadron, in Okinawa.

Though the period covered by this history extends from 1 July 1968 to 30 June 1969, this history will, rather than be confined to an exact period, expand coverage in some areas. This will provide readers with as much background of a particular situation as possible. In preparing this history, free use has been made of previous histories and other documents related to the situation.

As much as possible, the Historian has also made use of the cross-reference technique. This technique

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was adopted so that readers might gain an insight into the varying viewpoints of the various agencies about the same program, project, or problem.

Any controversy arising from interpretation is this Historian's responsibility.

Should any reader have information which will reflect a truer picture of unit activities, corrections are welcomed, provided they are substantiated.

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CHAPTER I

THE CHANGING SCENE

THE MISSION

Pacific Ground Electronics Engineering-Installation Agency (GEEIA) Region's mission remained unchanged in fiscal year 1969 (FY 69) as did its area of responsibility. From Hawaii to the 90° east meridian, from the Aleutian chain to Antarctica, covering more than a million square miles was still our beat.*

We were still required to conduct all activities which would make Air Force plans for Communications-Electronics (CE) networks and stations a reality instead of plans. We continued to do some of the planning, most of the engineering, and all of the installation work on jobs we undertook. Basically, we were to deliver to customers complete installations of various types of Communications-Electronics-Meteorological (CEM) equipment. Planning, programming, engineering, supply, coordination, installation, testing, inspection were all a part of it.

Our maintenance function which came about as a result of the merger of Pacific GEEIA with other units in 1964 saw most of its effort concentrated at the

*Map, App. A, shows location of Pacific GEEIA Region units.

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2875th GEEIA Squadron, not excluding our other units which had the capability to do some emergency maintenance within their own area of responsibility.

The Annual General Inspection of Pacific GEEIA Region was conducted during the period 14 January - 15 February 1969, with the Region receiving an overall satisfactory rating. (See Chapter IV.)

COMMAND

Colonel Orville K. Reilley, who had served as Vice Commander of Pacific GEEIA Region from 5 July 1967 - 30 June 1968, assumed command of the Region on 1 July 1968, replacing Colonel Raymond E. Gandy who retired.

At squadron level, the following command changes took place during FY 69: At the 2875th Lt Colonel John S. Smith assumed command on 5 March 1969, replacing Colonel Joseph A. Savuto. At the 483rd, Lt Colonel Coen A. King assumed command effective 1 October 1968, vice Colonel Phil H. Meyer. Lt Colonel George S. Osborne replaced Lt Colonel James D. Galloway as Commander of the 485th on 2 December 1968. Major Francis J. Capell continued as Commander of the 2876th GEEIA Squadron. Captain Marvin E. Dougharty and Captain Valentin W. Tirman, Jr., continued as Detachment Commanders of Detachments 4 and 2, respectively.

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STAFF CHANGES

Several significant staff changes occurred during FY 69. Captain Thomas R. Howes replaced Major Elmer J. Hickman as Chief of Plans and Management in July 1968. Major Sanford B. Kaiser replaced Lt Colonel Evard L. Mossman as Chief, Materiel Division, in May 1969; and Major Luther C. Bush, Jr., replaced Major Frank L. Shogren as Chief, Quality Assurance Office, in June 1969.

ORGANIZATION MODIFICATIONS

No significant changes occurred in Pacific GEEIA Region's organization this year. However, a major goal of uniting the Engineering Division, now located in Building 31, Hickam Air Force Base, with the rest of the Region Headquarters, now located at Wheeler Air Force Base, is still being pursued.

LOCATION OF UNITS...

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CHAPTER II

STAFF ACTIVITIES

ADMINISTRATIVE ACTIVITIES

The Region's Office of Administration focused all efforts on increased efficiency in all areas of administration in Region Headquarters and subordinate units during this fiscal year.

The project of updating Region publications continued, with emphasis placed on proper preparation. Twenty-one new or updated publications were published and 25 obsolete ones rescinded. A thorough review of publications maintenance was accomplished throughout the Headquarters. This was a weak area during the GEEIA Inspector General inspection in February 1969. Operational files were surveyed and discrepancies reported to division/staff office chiefs concerned. The results of these surveys were extremely rewarding. The Operations Division reduced its operational files from 16 to 2 and marked improvement of publications maintenance was noted in other offices. The office was able to perform long overdue reviews of subordinate unit publications during this period. Units were notified, in writing, of discrepancies. However, the overall effectiveness of these reviews cannot be determined until a later review is conducted.

The workload in the Travel Section was heavy as usual. The section made 1,415 temporary duty travel reservations, prepared applications for and obtained

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110 passports, 320 visas, and published 1,121 special orders. The loss of our very outstanding Travel Coordinating Clerk during this period posed a potential problem. However, he was replaced from in-house resources and the section continued to function with a high level of efficiency.

Workload in the Correspondence Distribution Center continued to increase. Unclassified correspondence processed numbered 444,000 pieces as compared to 423,744 pieces during FY 68. This increase was due to a notable increase in incoming messages. Of the total pieces of unclassified correspondence processed, 60,000 were incoming messages. Classified material decreased during this period; a total of 4,000 pieces were processed. The establishment of a registered pouch between the Region and Headquarters GEEIA improved the average experienced mail time between the two headquarters from 5 to 3 days.

The Records Management Project continued. Project was 95% complete at the end of the fiscal year. Contributing factors that hampered completion of this project were reorganizing of offices of record within the headquarters and loss of experienced records clerks. Offices surveyed corrected discrepancies and assistance given to offices reorganized was fruitful. Project should be completed by mid-FY 70.

The Region Security Program continued to progress. Subordinate units were furnished GEEIA 35mm security slides. Quarterly security inspection reports from headquarters staff offices and subordinate units indicated progressive improvement in administrative security. Through coordination with Headquarters GEEIA, duplicate 35mm security slide presentations were eliminated. With a workable program, participation percentages increased.

FY 69 was fruitful. Many of the administrative goals were accomplished. However, loss of experienced, highly qualified personnel by mid-FY 70 and incoming three-level (OJT trainees) could pose problems.

In the Civilian Personnel area, the ceiling authorizations for assigned 01 direct hire civilian personnel under the Manyear Program continued downward from 306 to a planned 300 by 30 June 1969. However, this program changed to a revised FY 69 and FY 70 Manpower Program effective 1 April 1969. This new procedure deleted the Region's ceiling as such, and Headquarters GEEIA became the approval authority for hiring authorizations on all subsequent vacancies. At the same time, 25 authorized positions were scheduled for deletion with 21 of these being deleted effective FY 4/69. As one position had already been transferred to GEEIA effective FY 2/69 to be utilized in centralized contract functions, the Region lost a total of 22 01 civilian authorizations during the year.

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	Authorized	Assigned	Ceiling
1 July 1968	336	296	306
30 June 1969	314	288	Controlled by GEEIA Headquarters

PERSONNEL ACTIVITIES

Many changes have occurred during this year affecting several programs pertaining to military personnel. Following are the major ones affecting this section:

a. The changeover of identifying personnel through the use of the Social Security Account Number rather than the Air Force Serial Number which has been in effect since beginning of the Air Force.

b. Career Motivation Programs for officers and enlisted personnel have been revised. Added emphasis given the First Term Airmen Retention Program through the Top Three Program.

c. The Air Force policy was changed to allow personnel the opportunity to extend their overseas tour to coincide with the school year and also to volunteer to remain in this area for a maximum of 48 months. As a result of these changes, applications have increased from nearly none to five a month.

d. The change to the NCO and Airman Performance Reports Manual (AFM 39-62) to render a report on Sergeants and A1C every six months has considerably increased the section's work in this area.

e. The Air Force has developed a new promotion system for enlisted personnel titled "Weighted Airman Promotion System (WAPS)." In this system, personnel considered for promotion to grades E-4 through E-7 will be administered the Speciality Knowledge Test (SKT) and Promotion Fitness Test (PFT) annually. Procedures are being developed to control this system. Study material is being received to make available to all personnel.

f. A procedure has been established to record the assignment preference of all enlisted personnel in the personnel data system. This was accomplished through the preparation of an Airman Assignment Preference Statement (AF Form 392). This provides information to the Military Personnel Center of the individual's assignment preferences at all times.

Officer Effectiveness Reports continue to demand extensive monitoring. An increase of 35 reports were submitted this year versus that of last year (FY 1968 - 132; FY 1969 - 167). Although workload increased, the quality of reports forwarded Headquarters GEEIA and AFLC was of the highest. All reports were submitted within the prescribed time and were without error.

The command interest to cite individuals deserving recognition has increased the number of recommendations and nominations processed. Ninety-six recommendations were processed for decorations, special trophies and

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awards and competitive award programs. The Airman Recognition Program (Quarterly and Annually) resulted in the processing of over 50 recommendations and folders. The 483rd GEEIA Squadron was awarded the Air Force Outstanding Unit Award. The Region, including all Squadrons, was recommended for award of the Air Force Outstanding Unit Award; results to be recorded in the next historical report.

Monitoring and conducting the Airmen Promotion Program for the Region Headquarters and subordinate units continued to be a time-consuming but very important activity. The new Weighted Airman Promotion System (WAPS) should eliminate a majority of the manual work in the future.

Detachment 6, Pacific GEEIA Region, was deactivated effective 1 July 1968, and personnel authorizations were consumed by the Region Headquarters. The military population for the entire Pacific GEEIA Region was steady the entire year with 1,394 authorized and 1,340 assigned even though the turnover was great, particularly during the summer months.

The Region Training NCO is responsible for monitoring the On-the-Job Training (OJT) and General Military Training Programs for the Headquarters Squadron Section and subordinate units. During the period covered in this report, a staff assistance visit was conducted in all but one unit (485th GEEIA Squadron) with satisfactory results. Through extensive guidance and support from the units and staff agencies, procedures and quality of training have greatly increased in the overall OJT program. As of 1 April 1969, Headquarters USAF deleted the SKT as a criteria for upgrading airmen to the 5- and 7-level skill level AFSC. Since April, the Commanders have established a pre-upgrade review board within the units, consisting of commissioned officers and senior NCOs E-7 and above, to interview each trainee prior to his being recommended to the Commander for upgrading to the 5- and 7-skill level. A total of 59 trainees were upgraded in the Headquarters Squadron during the period covered in this report. All units have completed more than 50% of their General Military Training to date.

The Training NCO monitors off- and on-duty education and management programs for personnel (military and civilian) within the Headquarters Squadron and Detachment 4, Pacific GEEIA Region. A total of 154 personnel (military and civilian) completed the following courses and training: Air Force Management for Supervisors I and II, OJT Trainer and Supervisors Courses, Effective Writing, ECI and CDC Courses.

OPERATIONS

During FY 1969, the Operations Division has realized two great achievements--reducing "Old Dogs" and FSD

(Forecast Support Date) delinquencies. On 25 September 1968, the Projects and Procedures Working Group was established. One of the principal activities of this Group was the elimination of "Old Dogs." Working in conjunction with the Installations Control Branch, this Group reduced the number of schemes from 1965 and earlier from 358 to 69.

Another of the tasks for this section was to evaluate and rewrite, when necessary, regulations, letters, supplements, Headquarters Operating Instructions (HOIs), Division Operating Instructions (DOIs), and position descriptions. During this period, many advances were made in the more efficient operation of the GEEIA Management System (GEMS). Much attention was paid to the Forecast Support Date (now GEEIA Completion Date (GCD)) and procedures for recognizing requirements for change of GCD far enough in advance to accomplish the change. This has resulted the second achievement: the decrease from 26.7 percent FSD delinquencies in July 1968 to 2.6 percent FSD delinquencies in May 1969.

A review was conducted of all base codes used in the GEEIA Workload System (GWS). All erroneous base codes were eliminated. A follow-on to this project was the correction of command codes in the GWS.

The success of the Pacific GEEIA Region "Old Dog" program is confirmed by the fact that the other regions have been directed to establish similar programs. Also, Headquarters USAF has directed all Major Commands to validate their old schemes.

All installations and on-site maintenance jobs in progress or signed with AFTO Form 88/217 exceptions continue to receive top management attention in the Command Control Room. Daily standup briefings are held, giving attention to a different squadron/detachment each day.

The GEEIA TELEX operation installed 22 May 1968 has proven to be of tremendous value in the daily management of the GEEIA mission. From July 1968 through May 1969, Pacific GEEIA Region had a monthly average of 117 TELEX messages sent and 139 received.

Within the Operations Installations Control Branch, there was some reorganization during FY 1969. The Wire Section handled "C" and "K" commodities in conjunction with "A" and "B" commodities from 1 July 1968 through 14 January 1969. Effective 15 January 1969, a new section, Comm Center/Crypto, was formed which was to handle only "C" and "K" commodities. This was necessitated by a constant growth in "C" and "K" commodity jobs. The present total is 688 "C" and "K" commodity schemes active in GEMS. Upon its formulation, the Comm Center/Crypto Section had 123 "C" and "K" schemes with delinquent FSDs. The fiscal year was closed out with no delinquent FSDs.

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Region workload showed a decrease from approximately 3,200 to 2,200 jobs on the books.

All the sections in the Installations Control Branch underwent major procedural changes with the implementation of GEEIA Letter 25-3, "GEEIA Workload System." The largest workload was the conversion of GEEIA Form 721's to the new GEEIA Form 104-6.

On 15-16 April 1969, personnel from Headquarters GEEIA, Griffiss AFB, New York, held briefings and question/answer periods on the implementation of the GEEIA Management System. They also reviewed reports to determine their justification and use.

In the Operations Support Branch, the Field Support Section provided direct support on 340 schemes involving problem areas. In addition to the in-station support, 30 man-months of on-site assistance in the form of temporary duty (TDY) was provided.

The Contract Services Section located in Building 104, Wheeler AFB, and GEPOSCE, located in Room 202B, Building 31, Nimitz Highway, were consolidated and relocated in Rooms 202A and B in Building 31 in July 1968. Due to loss of personnel spaces and the hiring freeze, the staff of this section has dwindled from 10 to 6. On the other hand, the workload has steadily increased. This year, we have negotiated and administered 596 engineering schemes as compared to 107 last year, with a

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total dollar obligation of $737,650 compared to $590,773.61 last year on the previous Indefinite Quantity (IQ) Contract. In addition, we have or are in the process of inspecting, testing, and accepting 78 sites for 9 Engineer, Furnish and Install (EF&I) Contracts involving $8,950,656. Twelve (12) Statements of Work (SOW) have been reviewed and processed to Headquarters. We have 8 current E&F Contracts.

Several changes have taken place which have increased or will ultimately increase the efficiency of this Region's contract capabilities. An Engineering Contracts Review Branch was organized in April 1969 to effect timely submission of requirements to be placed on the IQ Contract and to insure timely review of Contractors' Site Concurrence Letters (SCLs), Tabs A and B, and drawings. GEEIA Field Installation Representatives (GFIRs) were placed under the direct control of Contract Services Section (GEPOSC). We provide sample copies of acceptance documents, transfer documents, etc., to the GFIR(s) to insure all documents are prepared in the correct format and signed by the appropriate responsible agency representatives.

The Resources and Training Groups were consolidated into the Resources/Training Section since it was realized that not only was augmentation needed, but also a corresponding training program was needed to provide the most

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efficient utilization of augmenters. To better achieve this, a cross-reference file was implemented in the section. One set of cards has the names of personnel followed by the equipment he is proficient in, and the other set has the equipment followed by the names of personnel who are proficient in it.

Also during the period, two Republic of China Air Force (ROCAF) officers were given 16 weeks of familiarization training at the Region. All the Region offices and divisions participated. This was the third such group to have been trained since the program's inception.

An average of 150 Continental United States (CONUS) augmenters were used per month with an additional average of 57 used monthly by internal augmentation.

The Air National Guard program,called Oriental Fast Race, accounted for a large percentage of the augmentation and was pronounced a great success by all concerned.

During June 1969, the daily Manpower Utilization Report was changed from straight message format to AUTODIN.

The beginning of the enroute training program in FY 1969 has not yet provided a noticeable effect, but this is due to the long lead time of eight months which is required.

The Maintenance Control Branch began the year with AN/FPN-16 panel fabrication in August 1968 at the 2875th GEEIA Squadron covered by OCAMA project directive.

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The FY 69 scheduled Mobile Depot Maintenance requirements of approximately 300,000 manhours constituted a full workload in the maintenance area.

Then on 22-23 September 1968, Typhoon Della struck Miyako Jima and Kume Shima, Ryukyu Islands, starting a monumental restoration of facilities adding to our already heavy maintenance workload. (See Project Pacer Town in Chapter III.)

The Korean navaids upgrade project was initiated in October 1968, followed by Project Peace Bird and by Project Commando Hasp.

During the year, the Operations Division completed 1,367 schemes and 521 work orders for a total of 1,888 completed projects in FY 69. See Chapter III for resume' of other specific projects.

Indefinite Quantity Contract. The Indefinite Quantity Contract F04606-68-D-0662 awarded to Kentron Hawaii, Ltd., in July 1968 has provided a positive tool in the accomplishment of the assigned mission. A total of 116 Delivery Orders were negotiated and administered. This has resulted in action being taken on a total of 596 schemes for preparation of SCLs, Tab A's and B's, drawings, and traffic studies. In addition, a total of 36,295 drafting units have been completed. Approximately 85% of the effort procured through this contract was in direct support of the SEA mission. Monetarily, delivery orders written against this contract represented total obligations of $737,650.

This contract was awarded to cover a period of 12 months commencing 15 July 1968 with an option to extend for a period not to exceed 18 months. The contractor was advised on 1 May 1969 of the Government's intent to extend the contract for an additional period of six months. Final option notification to the contractor must be provided not later than 5 July 1969. This will result in a contract expiration date of 15 January 1970. This option will be exercised in view of the contractor's satisfactory performance over the initial 11 months of the contract.

Action is being taken in preparation for a new contract to cover a period of 12 months with two one-year options to extend. This contract will also require the contractor to reproduce, fold, and collate all products completed as a result of his performance. It is our intent to have the new contract awarded not later than 1 December 1969. This will provide for continuous contract coverage during the mobilization effort by the successful contractor.

MATERIEL

The previous designation of Logistics Support Division was changed June 1968 to Logistics Support Branch. The branch function remained the same, to include surveillance over the equipping of Pacific GEEIA Region

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squadrons and detachments with vehicles and EAID-type equipment. Management of all phases of Region depot-level maintenance material support is still carried out by this office. Obtaining all expendable supplies and special support for the Region Headquarters remains a responsibility of the branch.

The past year found the squadrons/detachments with an ever-increasing need for improved equipment and vehicles necessary to meet the demanding workload throughout the PACAF area. Several studies and recommended changes were submitted to Headquarters GEEIA to effect

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positive procurement action on vehicles. These studies took into consideration the various needs of each unit based on the terrains in which they must work, as well as the climatic conditions affecting the vehicle body and chassis. Several M-Series vehicles were proposed as replacements for the often inoperative and less-than-adequate commercial type vehicles now in use by the Southeast Asia (SEA) and Philippines Squadrons.

During this period, procedures were developed for streamlining the method used to monitor material requirements in support of maintenance work orders both for in-shop and on-site jobs. Timely reporting through the use of the Squadron Priority Monitor Report identifies those items which require command assistance in order that receipt of the item is within the prescribed time necessary to begin scheduled work. Included were requirements for periodic update of GEMS milestones relative to material Bill of Material (BOM) receipt and subsequent availability date.

Other significant aspects of the branch operations are as follows:

a. Tilt Deck Trailer to Transport the Task Force 1000 Trencher. A thorough service test of a commercial four ton tilt deck trailer provided by AFLC from available stock was made to determine whether the Davis Task Force 1000 Trencher could be transported on it. The test was

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conducted at Detachment 4, with personnel in attendance from Region Materiel and Operations Divisions and Quality Control Office, as well as the Operations Officers from each squadron. The trailer was found to be too light in structure to safely haul the trencher. The only vehicle capable of towing the trailer is the PM-20 Polemaster Line Truck, due to its electrical braking system. Motion pictures, slides, and still photographs were made of the loading, hauling, and unloading of the trencher to further demonstrate the limited capabilities of the trailer in our evaluation. This was subsequently forwarded to Headquarters GEEIA.

b. GPC-28AF Utility Trailer Hitch Modification. The need for an adjustable hitch was recognized early in the fiscal year. The hitch would permit vehicles of various sizes to tow the trailer without any chance of the rear end of the trailer dragging if tilted too far back while being towed. A detailed recommendation to Headquarters GEEIA pointed out the advantage of the modification. After close study and review, Headquarters GEEIA awarded a contract to the manufacturer, T.A. Pelsue Company, for just such a hitch for all GEEIA units possessing utility trailers.

c. Rough Terrain Forklift. Two rough terrain forklifts so urgently needed at the 483rd GEEIA Squadron and the 485th GEEIA Squadron were finally airlifted in

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April 1969. While the authorization for this rugged piece of materials handling equipment remained unchanged at the 485th GEEIA Squadron, with four each, the authorization of one each at the 2876th GEEIA Squadron was transferred to the 483rd GEEIA Squadron to increase their authorized quantity to two each.

d. Low Profile Construction Trucks. A highly versatile construction truck is scheduled to soon join the GEEIA vehicle fleet, completely replacing the V-17, V-18, and PM-20 Polemaster line trucks. The first increment of 10 trucks is destined for the SEA Squadrons. A total of 43 Low Profile Construction Trucks with V-8 engines and 6x4 wheel drive will be distributed throughout the Pacific Region. Its capabilities are far beyond the construction trucks now being used. Each vehicle is equipped with a hydraulic personnel carrier (cherry picker) capable of handling 2,000 pounds and extending to 68 feet. The auger will dig a hole 16 feet deep in a position directly behind the truck and a hole 11 feet deep extended to the side. A 90-foot utility pole can be set without any difficulty. As the name implies, the trucks are low in overall construction, allowing for easy airlift, even by C-130 aircraft.

e. TF-1000 Trencher Track Breakage. Frequent track breakage began to plague the 1967 model trenchers after they were placed into heavy use. After several months

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of continued breakdowns and after submission of an unsatisfactory report, the manufacturer was confronted with the problem. As a result, a complete modification of the chassis and track assembly was considered necessary to rectify the difficulty. Headquarters GEEIA awarded a contract to the Davis Manufacturing Company for the improved track modification. Delivery was made during May 1969 and by year end, almost all modifications had been completed.

f. Pow-R-Safe Model B-2500 Tool Tester. As another step toward assuring that our personnel in the field work with safe equipment, arrangements have been made, without obligation to the Government, to obtain from the manufacturer an electrical tool testing device, on a temporary loan basis, in order to evaluate it. The Pow-R-Safe tool tester will test almost any electrically operated machine or household appliance as well as electric tools. The 2875th GEEIA Squadron will perform all tests on the unit and after the 30-day loan period, will provide their evaluation of it. If the test is positive, each squadron will pursue its acquisition through host Equipment Management Office (EMO) channels.

g. GEEIA Emblems for Vehicles. A GEEIA-wide effort is under way to affix GEEIA emblems to their vehicles. To insure Region-wide uniformity on this project, the 2875th GEEIA Squadron was asked once again to assist us by making recommendations on the proper location to affix the decal on each specific type vehicle. With their suggestions, a proposed supplement to GEEIA Regulation 77-1, "Marking of GEEIA Organizational Equipment," was forwarded to GEEIA for their review and consideration for adoption GEEIA-wide. Final action is pending review by GEEIA (GEOAS).

h. Equipment. For the first time in Region history, equipment funds (EEC 639) were requested and received for the purpose of procuring equipment items to fill urgent requirements for the squadrons and detachments and/or to obtain improved equipment for testing and evaluating purposes. These are:

(1) Portable Steam Cleaner. The 483rd GEEIA Squadron had an urgent requirement for a steam cleaner to permit better vehicle corrosion control and maintenance. The model purchased was given a preliminary test at Region Headquarters. It is expected to meet all requirements necessary to provide long and continued service for corrosion control use on vehicles and equipment. It has a kerosene-operated burner with a one-half hp electric pump and has a 110 gallon an hour capacity.

(2) Metrotech Model P-440 Pipe and Cable Locator. This highly sensitive locator was locally procured with the intention of improving the quality of the equipment now in use in the field. Preliminary

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tests were conducted at this Region with very good results. However, it was determined that an actual on-site test was necessary in order to put it through a complete series of tests under all types of working conditions. The 485th GEEIA Squadron was chosen because of the unusual and demanding environmental conditions in SEA. This test set is a successor to the very highly rated Fisher M-Scope, being about half the price but equally sensitive. If evaluations of the test prove to be successful, action will be taken through host base supply (EMO) of each respective unit to obtain replacements for the inaccurate test sets now in use.

(3) Winch Line Tensioner. Upon a recommendation from the 2875th GEEIA Squadron, one winch line tensioner was procured for test purposes and possible adoption GEEIA-wide. The unit features a safety improvement in reeling cable on a PM-20 Polemaster truck. Its function is to hold the cable tightly to the reel when reeling, thereby keeping the cable wound evenly. In the past it has been necessary to guide the cable by hand, a very unsafe practice.

(4) Wire Wrap Tool Bits and Sleeves. Continued difficulty has been experienced trying to maintain sufficient quantities of wire wrap bits and sleeves. A large order was placed, received, and distributed to each unit requiring them. Acquisition of these bits and

sleeves should prevent work stoppages which have been imminent several times during the year in SEA. Other procurement action was also made, for such items as splice crimping tools, cable grip tools, and large size drill bits, in order to assist each squadron and GEEIA team chiefs on-site as requirements were made known.

i. The staff assistance program is an integral part of our efforts to assist the squadrons and detachments in better supporting the GEEIA mission. One of these included a Region Conference held at the 2875th GEEIA Squadron to review and make proposed changes to TA 713. Operations personnel from several units who were familiar with the equipment needs of their respective squadrons/sections were present and assisted in the review. In another instance, guidance was provided to the 2876th GEEIA Squadron in formulating tool crib procedures. Other visits were equally important through the year. It is felt that each visit has resulted in an improvement of the overall support posture of the GEEIA unit involved.

The Scheme Management Branch provides for the preparation of Bills of Materiel (BOMs), call-out of materiel, control over the shipments and receipts of all material associated with major Communications-Electronics-Meteorological (C-E-M) scheme installation. In addition, the Branch provides support for emergency requirements

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during the installation phase, oversees the final sign-off of the installation and the disposition of excess supplies and equipment.

a. Scheme Monitoring Section:

(1) During this reporting period, approximately 1,156 schemes were monitored and processed. From this total, 129 of these schemes were emergency implementations. The total shipments 100% supplied and partials for this same period were 740 schemes.

(2) This section through Headquarters GEEIA has enjoyed a sharp improvement over delinquent schemes for the first six months of this calendar year. The average delinquency rate for the last six months of 1968 was 23.6% compared to the first six months of 1969 which currently stands at 18.5%. The two best months were March 1969 and June 1969 in which only 94 schemes (14%) and 101 schemes (16%), respectively, were delinquent. These percentages are the most outstanding achievements contributed by this group within the past three years. Another major accomplishment is the amount of schemes delinquent three months and beyond. During the last six months of 1968, the average monthly delinquency rate was 38 schemes compared to the first six months of 1969 which is 17 schemes. A steady improvement in this area started in the month of November 1968 and has steadily improved during the first six months of 1969. The lowest

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delinquency rate for the months of March and May 1969 were 10 schemes and our highest was 27 schemes in the month of February 1969.

(3) A sharp decrease in scheme cancellations was noted for the first six months of 1969. For the last six months of 1968, a total of 285 schemes were cancelled compared to 157 schemes for the first six months of 1969.

(4) Excess material after installation. The monthly reporting and close monitoring and review of AFTO Form 88's and Transfer of Accountability Documents (TADs) reveals that a noted decrease in excess material is being reported after installation. The last six months of calendar year 1968 this Headquarters requested and/or disposed of excess materiel for 112 schemes compared to only 35 schemes for the period January - June 1969. The only contributing factor to support this area is that the Region's Engineering Division is producing quality BOMs and only calling out the exact quantity needed for successful scheme installation.

(5) Command Control Board Reporting. This Headquarters is still experiencing a high average of work stoppage and/or anticipated work stoppage schemes per month which is 40 to 45 schemes. There appears to be no relief in this area due to the number of schemes being installed and the distance that the squadrons are located to the prime air materiel areas.

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(6) Suspended Shipments. Great emphasis was placed on suspending scheme package shipments as of September 1968. The prime purpose of this new program was to stop all shipments for which the allied support is unknown as well as other milestone data that would prevent the scheme from being installed as scheduled. Since the above date and for the remainder of calendar year 1968, a total of 56 schemes were not called out or shipped. For the first six months of 1969, a total of 105 schemes shipments were also stopped. This program is a major accomplishment in our materiel area compared to the old concept of operation prior to September 1968 where, once a scheme was 100% supportable, shipment was made directly to the various supply points. This new program also realizes a great savings in manhours and money to GEEIA and the Air Force when we consider the withdrawal of scheme material from the warehouse, packing, crating, and transporting the scheme package to site and find out that other program changes are being made by the command/customer and, therefore, a firm installation schedule cannot be determined. This program is GEEIA's assurance that, if the command/customer fails in their efforts to meet their milestones and commitments, we hold all shipping actions in abeyance and devote our materiel efforts and support to those schemes with actual and confirmed milestone dates.

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b. Scheme Services Section:

(1) During the period of January through June 1969, the workload of this section was increased by 21.5% compared to the last six months of calendar year 1968. The prime reason for this increase is attributed to the number of emergency and routine schemes processed during this period. This workload also increased the total items researched and processed by 10,020 line items. The following is a breakdown of the schemes and line items processed compared to the last six months of calendar year 1968:

Schemes	Volume	Line Items	Volume
Jul - Dec 68	424	Jul - Dec 68	18,544
Jan - Jun 69	515	Jan - Jun 69	28,564
Difference:	91		10,020

(2) A slight 5.5% improvement has been made in the timely receipt of draft BOMs from the Region's Engineering Division during the first six months of this year. This area continues to be a troublesome spot in the Scheme Services Section. Late submission of the BOMs to this section jeopardizes the materiel milestones and in most cases to insure that immediate action is taken to research and process these BOMs, overtime is always required.

(3) Statistics during this reporting period revealed that the month of May 1969 was the most difficult

month for BOM receipts and processing. From a total of 62 BOMs received, only 19%, or 6 BOMs, were received and processed with the normal lead time. The month of February 1969 was the most productive and best month for BOM processing. From a total of 134 BOMs received, 84%, or 113 BOMs, provided the normal lead time for processing.

c. Major Projects. (See also Chapter III.) The Scheme Monitoring Section is involved in providing material support for all hi-interest schemes assigned to this Region with particular attention stressed on the following programs:

(1) Pacer Dog. Fiscal year 1969 saw the implementation of Pacer Dog. This project consisted of four schemes which provided the material for the installation of four AN/FPS-90 Height Finder Radar Sets throughout Southeast Asia. Material responsibility for this project started on the first scheme in April 1968 and ended in January 1969 on the last scheme. Minimum supply difficulties were encountered and resolved in short order. Presently, two of the four schemes, 2942A7K0-KZJW-X1102 and 2943A7K0-AVFL-X1102, are being delayed because of allied support problems.

(2) Commando Escort. The Thailand portion of Commando Escort began in FY 1969. The first step consisted of the consolidation of the six original schemes

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into two all-inclusive schemes. Resupply was necessary in some cases with both schemes becoming 100% supplied in late April 1969. Both schemes are in the installation phase and presently on work stoppage for defective Collins parts.

(3) Tandem Switch. This project provided long distance direct-dial capability for numerous bases throughout Southeast Asia. The project consisted of approximately 25 schemes, many of which were on-site engineered. Supply actions started in mid-1968, and various supply problems were encountered due to long lead time for contractor-supplied material. However, through the use of on-hand excesses and 9800 stock assets, these problems were quickly resolved. All schemes were fully supplied and installed by early March 1969.

(4) New Requirements Ching Chuan Kang (CCK) Air Base. This project was designed to provide SAC with a secure voice radio system at Taiwan. Phase I of this project was completed in May 1968. No material difficulties were encountered until SAC-furnished material could not be located. Nevertheless, this problem was resolved by diverting the required material from in-country excesses. Phase II of this project was implemented in October 1968. However, due to the non-availability of AFLC funds, schemes subsequently were

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forced into held-in-abeyance (HIA) status. Nevertheless, schemes are currently scheduled to be completed in December 1970.

(5) Poles and Crossarms Assets. The pole and crossarms inventory in Region activities were less than desirable. This brought to our attention a need for increased management and control. Recognizing this need, a monitor was assigned to establish procedures and maintain adequate controls over these assets. The monitor immediately devised procedures for stock level control and has provided instructions for the realignment of all assets within the Pacific Area. Results of this management action are still pending.

(6) VHF Modernization. The basic purpose of this program was to update and modify 49 schemes located in 15 separate locations in Southeast Asia. The major material difficulty encountered was the non-availability of the RT-723 Radio Transmitter. As a result of the non-availability of this item and the slippage of scheme programs, the RT-723's were assigned under separate schemes to alleviate future installation delays. To date, schemes are being installed without the RT-723. A firm date and availability of the RT-723 are still unknown.

(7) Kamphaeng Saen, Thailand. This project was assigned to provide the C-E-M requirements for the

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installation of a Royal Thailand Flying School (Bare Base). Thirteen schemes were assigned to accomplish this major installation consisting of 34 major items and 941 minor items. This project was slow getting started, mainly because of allied support problems. Accelerated emphasis was generated at all command levels to insure that material and installation delays were not encountered. To date, 12 schemes have been installed, 5 are suffering minor material problems and are on work stoppage. Also, one scheme remains to be installed pending receipt of an RT-723; estimated delivery date is unknown.

(8) Seek Silence. This program provided a secure voice communications (ground-to-air) in support of operations in Southeast Asia. Installation began in March 1968; however, it was found that the radios involved needed modification. The modification delayed installation until July 1968. To date, 37 schemes have been supplied and completed, 18 cancelled, 2 are now in progress, and 12 more to be installed to complete this program. The remaining schemes are being delayed due to allied support and resupply of damaged and deteriorated material caused by improper storage.

(9) Commando Indian - Thailand. On or about 7 February 1969, this Region was tasked to assume the installation and equipment/supplies acquisition for subject project. This section was tasked to coordinate

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with the 5th Tactical Control Group and the Pacific Communications Area supply coordinators and obtain all materiel availability data. Our efforts in this matter was fruitless; but, through our efforts and exchange of numerous letters and messages, we were able to secure materiel status from Headquarters GEEIA and OCAMA. The three basic schemes assigned were 9000A9K0 - Udorn, 9001A9K0 - Ubon, and 9002A9K0 - Green Hill. Through close coordination with the Project Engineer, this division was able to secure all the Tab A's and also provide appropriate materiel availability input to insure that we had accurate materiel status for all materiel involved with this project. Due to the various commodities involved, the Project Engineer assigned and prepared new Tab A according to the type of installation to be effected. In view of this, there were one "A", two "R", and one "X" commodities assigned to each site location. All Tab A's were air mailed to all activities concerned and associated with this project on/or about 30 June 1969. The scheduled call-out date is August 1969 with a Date Material Required (DMR) of October 1969. We do not anticipate any materiel delays in support of this program; however, this division did advise Headquarters GEEIA that the inside plant non-stocklisted items procurable through Stromberg Carlson and Cook Electric must be procured at the earliest possible date to insure that subject items

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will be made available by the DMR.

(10) Straw Hat Schemes. The schemes in support of this project were assigned by Headquarters GEEIA. The entire project itself was coordinated by Headquarters GEEIA with the Director of National Security Agency (DIRNSA), and instructions regarding this Region's responsibilities and support efforts were received on 14 May 1969. Schemes involved in this project were 9025A8K0 - Misawa, 9026A8K0 - Clark, 9027A8K0 - Osan, 9028A8K0 - Da Nang, 9029A8K0 - Onna Point, and 9030A8K0 - Shu Lin Kou. During the initial planning stage, the shipment of subject schemes were earmarked for the respective Security Services activities and all Tab A's prepared indicated this as the "Ship To" agencies. However, these shipping instructions were later changed to the respective GEEIA Supply Points. During the initial shipping cycle of all materiel in support of this project which were shipped directly from the contractor, numerous problems were encountered; i.e., advance copies of the shipping documents were not provided this division, the packing list prepared by the contractor did not provide the same line item number as appeared on the BOM, outshipping information was not provided to the GEEIA Supply Points, etc. The foregoing situation made it difficult for this division, as well as our GEEIA squadrons, to verify receipt and item-by-item inventory for items received. However,

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after a cross-check was made of the contractor's packing list and the BOM matching the nomenclature and type/model number identification, we were able to verify accurate receipt information. The foregoing situation was brought to the attention of Headquarters GEEIA who in turn advised DIRNSA of this problem. Due to the procurement slippage of the Tech Control Voice Net and three other minor items which are part of this net, same were deleted from all Tab A's and will be provided from follow-on schemes 1161A8K0, 1162A8K0, 1163A8K0, and 1164A8K0 with DMRs in January 1970. All excess materiel from the initial installation of the above schemes are being inventoried by each respective Team Chief and boxed and shipped back to the applicable supply point for future use with the foregoing follow-on schemes. Currently, two schemes, 9026A8K0 and 9030A8K0, are installed and AFTO Form 88's signed; two schemes, 9025A8K0 and 9029A8K0, are in the installation phase; 9028A8K0 is in HIA status; and 9027A8K0 is in the materiel call-out phase.

(11) Cost Reduction. In November 1968, a special project was initiated to utilize the large volume of excess cable in Southeast Asia. As a result of careful planning and extra work efforts, numerous diversions from cancelled schemes and realignment of excesses in prepositioned stocks and outstanding cable excess assets were shipped to all Pacific GEEIA Supply Points having

requirements for this material. It was envisioned that, as a result of this action, thousands or even millions of dollars would be saved as a result of this project. Therefore, a Cost Reduction Program Individual Savings Action Number F694-0874 was prepared and submitted through command channels showing a savings of over two million dollars. This action was approved as a validated cost reduction item of $2.5 million.

ENGINEERING

The beginning of a new fiscal year is perhaps a good time to reflect upon the accomplishments and failures of the past twelve months. This history report has been compiled to present a reasonable overview of engineering activities during FY 69. Highlights of particular programs and projects have been included which are representative of the broad scope of engineering activities undertaken by this division during the past fiscal year.

ENGINEERING CONTROL BRANCH

The mission and responsibilities of the Engineering Control Branch were greatly enhanced during FY 69. GEPEC, under the leadership of Lt Colonel Charles L. Bryant, underwent several reorganizations in order to implement their expanded management function.

a. The Production and Workload Control Section was expanded in scope and capacity. Manning was increased from one officer and five civilians to five officers and

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seven civilians.

b. A Contracts Section was formed in GEPEC with three officers and six civilians to monitor and control Division contract actions.

c. A Production Center was formed to consolidate all scheme reproduction and distribution activities. Manning consists of four enlisted personnel and a typing pool of five typists.

d. An Engineering Control Room was established to provide real-time management data.

The Engineering Division production for FY 69 totaled 891 schemes and 372 job orders. Included were 36 pre-CEIP engineering completions. Production showed a steady increase throughout the year from a total production of 67 for July 1968 to 209 completed in June 1969. The average in-house workload per month averaged around 1,100 active tasks.

Since emergency/priority work is the rule rather than the exception, the abbreviated scheme was devised. The abbreviated scheme combines the Site Concurrence Letter/Installation Specifications/Bill of Materials on a drawing. It was designed to facilitate processing of simple schemes through the engineering and implementation phases using available materials in-country. Headquarters GEEIA is currently evaluating this method of scheme processing for eventual inclusion in USAF Technical Orders

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and Manuals for accelerated scheme implementation.

ENGINEERING SERVICES BRANCH

During FY 69, scheme engineering received vital and timely support from the various sections within the Engineering Services Branch.

a. The following tasks performed under various job orders are typical of the work accomplished by the Electromagnetic Compatibility/Measurements Section:

(1) The Mito survey was an exhaustive study of the radio frequency environment of several locations in the Kanto Plains area of Japan. Eight men, including three borrowed personnel, performed this survey. The results are contained in a 350-page report.

(2) Two engineers, working individually, have been working full time using borrowed teams for Circuit Conditioning tasks involving the Automatic Digital Network (AUTODIN), Automatic Voice Switching Network (AUTOVON), and Automatic Secure Voice Communications (AUTOSEVOCOM) projects. Work is progressing satisfactorily and will continue into the foreseeable future.

(3) The Pacific Interim Automatic Command Controls System (PIACCS) tests and evaluation job in Southeast Asia was completed by two augmentees working 50 hours per week over a several-month period.

(4) A team of six men, including two augmentees, successfully resolved several radio frequency

interference problems of the Air Force Systems Command (AFSC) Satellite Tracking Facility at Northwest Field, Guam. The system acceptance tests had been unacceptable due to interference prior to their assistance.

(5) One team has been working several weeks on a serious interference problem to the Instrument Landing System at Ching Chuan Kang Air Base, Taiwan. Hundreds of plastic welding factories are emanating radio frequency interference from their welding machines and many of the factories are located under the approach pattern to the runway. This job is still in progress.

b. A goal for drafting to eliminate 300 delinquent schemes in the plant-in-place phase was met with success by 1 December 1968. During FY 69, a record number (1103) of as-installed schemes were completed in the plant-in-place phase, and 1,482 active scheme work orders were processed and completed. A consolidated drawing index arranged by base designator code and listing drawings by number and associated information was compiled and published. Permanent two-shift operation was implemented for Files and Reproduction due to an increased workload. Record reproduction was made in May 1969 with 37,811 prints processed.

It is appropriate that we give due acknowledgment to the excellent support rendered by the many augmentee personnel who contributed to the engineering effort

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during FY 69. A total of 48 military and civilian personnel from three Zone of Interior (ZI) Regions were TDY to the Engineering Division for various extended periods, performing in engineering positions commensurate with their knowledge and experience.

Specific projects are covered in Chapter III.

QUALITY ASSURANCE

Quality Assurance became a command interest item during FY 69. Under guidance of AFLC, the Quality Assurance Manual, GEEIAM 74-2, and Quality Control Manual GEEIAM 74-3, were rewritten and combined into one manual, GEEIAM 74-1. This office furnished manpower and material in rewriting the manual. Major Frank L. Shogren, Chief of Quality Assurance, made two TDY trips to Headquarters GEEIA for the purpose of rewriting and consolidating the manual. MSgt C. B. McClain attended a conference at Headquarters GEEIA for training on the new manual. The new manual was published 1 April 1969 and preliminary implementation has taken place within the four squadrons and two detachments. During FY 69, 84 on-site inspections and 74 reviews of engineering products were accomplished. There were 9 on-site inspections that were rated unsatisfactory for either workmanship or safety violations. Forty-six reviews were returned to the Engineering Division for further action on the noted deficiencies. The total on-site inspections for FY 69 were down from FY 68

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but scheme reviews showed a marked increase.

During FY 69, only two inspectors were assigned to this office until April 1969. On 28 March 1969, SMSgt Evart E. Rywant departed for the ZI and TSgt Lloyd S. Waters arrived from Vietnam on 17 April 1969. On 10 April 1969, MSgt William S. Coleman, Telephone Central Office Inspector, arrived followed by MSgt Richard G. Miller, Navigational Aids Inspector on 12 June 1969. Major Luther C. Bush, Jr., was assigned as Chief of Quality Assurance on 23 June 1969, replacing Major Frank L. Shogren, who rotated to the ZI.

Trends and Analysis. This functional part of quality assurance is designed to pinpoint trends or problem areas which could detract from mission performance. This office has performed analysis on AF Form 1146, Engineering Change Request/Authorization; GEEIA Form 57, Scheme Review Checklist; and GEEIA Form 76 and the new GEEIA Form 261. Data from these reviews had been furnished to appropriate divisions within Region for necessary action. The Region has implemented the new QA program and at the end of FY 70 will be able to pinpoint more accurately areas that could hamper the overall mission of GEEIA.

Safety. A dynamic and aggressive Ground Safety Program was continued throughout the Region area of responsibility. The success attained and the interest stimulated was directly attributable to the Command support given the program. Although our record for calendar year (CY) 69 was far from the anticipated goal of no accidents, reportable accidents were reduced by 50%. The FY 69 summary is as follows:

Military Disabling Injuries..........9

Civilian Disabling Injuries..........0

Government Motor Vehicle Accidents....5

Private Motor Vehicle Accidents.......3

Fatalities...........................0

Due to the above statistics, 201 productive mandays were lost with an increased expense of $62,982. A most definite and gratifying accomplishment was the positive efforts taken to curb the fatality trend, and the year ended with no deaths. In order to achieve the desired results, the Region Accident Prevention Plan was reviewed and rewritten. A new approach was taken in that the plan was written in manual format complete with the how-to-do type of information rather than just the why-we-need-to guidance. To make it more meaningful, all squadron and detachment safety technicians attended a week-long seminar to discuss and finalize this manual. Although several deterrent actions have delayed the publishing of this manual, it is now scheduled to be implemented by 1 September 1969.

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To provide more emphasis to safety problems to our units and to escalate the level of interest of accident prevention at the Region level, the Region Safety Council was reorganized. On 1 January 1969, the former council was designated the Headquarters Squadron Council. A new council was appointed consisting of the Chief of each staff office, the Region Safety Officer and NCO, the Region Sergeant Major, and is chaired by the Region Vice Commander. This council meets quarterly with the express purpose of providing guidance and policy in support of the accident prevention program.

Command support for the safety program was direct, aggressive, positive, and unrelenting which accounts for the unilateral interest among all echelons. All methods of communications were used (verbal, visual, written) to spread the safety message with the pressure applied continuously rather than special periods or categories.

The Incentive Awards Program was evaluated and additional awards were established. A large trophy will be presented to the unit which achieves the best overall performance for a six-month period. The unit winning the award for three consecutive six-month periods will keep it. Four additional plaque awards will be given to the units who have the best single performance in the Military Disabling Injury, Civilian Disabling Injury, Air Force Motor Vehicle, and Private Motor Vehicle areas.

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respectively. The "Royal Order of the White Elephant" award for poorest performance will continue. The overall best performance award went to the 485th GEEIA Squadron and the "White Elephant" returned to the 483rd GEEIA Squadron.

In the fall of CY 68, a requirement to set twelve 90-foot telephone poles at Monkey Mountain, Vietnam, was established. The task was further complicated in that poles would be set in a semi-cleared mine field using inexperienced personnel. To complicate the job further, terrain conditions prohibited setting the poles in the conventional manner. Instead, the poles were set by helicopter which added to the extremely hazardous conditions. Due to the safety-consciousness of the team, the job was accomplished smoothly and without injuries or problems.

Safety Training. The traffic safety training required by AFR 50-24, "Traffic Safety Training," was emphasized in all units. At Region level, the energetic efforts of the Safety NCO and excellent support by the Hickam Air Force Base Safety Office insure that all eligible personnel are trained. Weekly safety briefings were established at Region level to inform all incoming personnel of the Region program and peculiar safety hazards prevalent in Hawaii. All units continued their exacting briefing procedures as well.

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During the entire year, the Region Safety Officer and NCO conducted many briefings locally as well as in the field. A continuing effort was made to get all supervisors to shoulder more of their responsibilities for a positive safety program and to take necessary corrective actions.

Safety Inspections. The semi-annual safety surveys were conducted at all units with follow-up inspections completed six months later. Several safety inspections or evaluations were also made of items tentatively scheduled for use within the Region. An in-service test of a proposed tilt deck trailer for TF-1000 trencher use was made with negative results. Examination of the "Hilti" fastening device was made as a replacement item for projectile type fastening devices with favorable results. Because of the efforts of all Region personnel, the safety function rated outstanding during the FY 69 Headquarters GEEIA Inspector General inspection. In addition, the 2875th GEEIA Squadron, Detachment 2, 2875th GEEIA Squadron, and the 2876th GEEIA Squadron were all rated satisfactory with Detachment 4, Pacific GEEIA Region, receiving an outstanding rating.

MANAGEMENT SERVICES

During FY 69, the Region Performance System was modified slightly to place emphasis on various objectives, such as improvement in the manhour accounting system and differentiation between contract and non-contract installation jobs. In this regard, the Region Headquarters Operations Division has been made responsible for installation starts and contractor installation completions, and the Region Headquarters is now a competitor with the squadrons and detachments in the monthly Management Performance System. Competition throughout the Region has remained at a high level throughout the year as evidenced by the constantly changing relative positions of the squadrons/detachments.

Region Management Data Summary. This management tool has also undergone considerable changes during the year. These changes were primarily refinements in the presentation of data to make the information compatible with some of the new GEMS products available after 1 July 1968. The emphasis in this document has been on meaningful information which will portray for management important trends affecting mission accomplishment. During the GEEIA Commander's visit to the Region in March 1969, he requested that copies of the Region Management Data Summary be provided to his office on a monthly basis. This is now being done.

In addition to the continuing data extracts from GEMS, special requirements were generated throughout the year for such things as briefings for Brigadier General Franklin A. Nichols (Commander, GEEIA) and General Jack G. Merrell (Commander, AFLC); a command presentation to the Pacific Communications Area Commander, Brigadier General Harold R. Johnson; and numerous special summaries for the

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Region Commander and the Vice Commander for use during their field trips. The availability of more accurate manhour information in GEMS has made the system a much more useful management tool, especially in discussions concerning future workload.

As a time-saving device to more easily and accurately prepare trip books for the Region Commander and the Vice Commander, a special system was set up by Management Services, in cooperation with the Command Control Room, permitting a rapid assembly of a work-in-progress status book within 48 hours. This is accomplished by double punching each 32 and 33 card so that at any given time a complete deck is available of the Command Control Room remarks for each scheme in progress. If a trip book is required, GEEIA Form 104-6's, "GEEIA Workload Status", are generated through the system and then overprinted with the Control Room remarks to achieve a one-page up-to-date summary for each scheme in progress. This method has proved entirely successful and has been under review by Headquarters GEEIA for possible use throughout GEEIA.

FINANCIAL MANAGEMENT

The financial status for FY 69 is shown in Appendix 1.

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PLANS

The Plans Group, Plans and Management Office, prepared Pacific GEEIA Region Operations Plan 1-68 (PGR OPlan 1-68) in support of the new GEEIA Wartime Guidance (WG). During the FY 69 Headquarters GEEIA General Inspection, several suggestions were made for improvement of the plan and a PGR WG was prepared, published, and distributed to all interested agencies during the last part of FY 69. This Region WG consolidates into one document the policy, guidance, instructions, procedures, and task assignments required to accomplish the Region's mission under the following conditions:

a. Cold War/Contingency Operations/Strategic War.

b. Disasters.

c. Continuity of Operations.

d. Survival, recovery, and Reconstitution.

The Region organizations Host-Tenant Agreements are being placed in the new format required by AFR 11-4. To date, four of the six have been republished in the new format and the other two are either in preparation or in PACAF approving channels.

Further attempts were made throughout the fiscal year to obtain Military Construction Program (MCP) approval for the new building at Wheeler AFB required to move the Engineering Division from its present extremely sub-standard accommodations and to consolidate the Region

Headquarters on Wheeler AFB. Our efforts in this regard have proven completely unsuccessful even with the intervention of Headquarters GEEIA and Headquarters AFLC. Quite frankly, it is doubtful that we will ever see this building in view of the stringent budget limitations on the military services. If, however, the new building has been resubmitted by PACAF for FY 72 MCP, we do not anticipate that it will survive the Department of Defense (DOD) or Congressional budgetary review of the program. The interim measures anticipated to move the Engineering Division to Wheeler into Building 102 also met a stumbling block due to the fact that the Navy's new barracks on Wheeler have failed to materialize, thus releasing a floor presently used by the Navy as billets for their personnel for use of our Engineering Division.

Actions have been initiated insofar as possible to effect an orderly and timely removal of CEM facilities from Southeast Asia. To date, PACAF has not provided a list of these facilities which are to be removed/relocated within this area. Until such a list is received, further action is not possible by this Region.

USAF SUGGESTION PROGRAM

For the second consecutive fiscal year, the Region increased its participation rate in the civilian portion of the program. The participation rate in FY 68 was 27% and 38% in FY 69, an increase of 11%. This exceeded the

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desired participation goal of 30% by 8%. The same improvement was true in the military portion of the program with an increase in the participation rate from FY 68 to FY 69 of 4.2%. However, the FY 69 participation rate missed the desired 30% participation goal by 4.4%.

COST REDUCTION PROGRAM

This Region had a most successful program during FY 69. Our goal was $15,000 and we had validated items totaling $1,118,000, which exceeded our goal by 7,453.3%.

Our total FY 69 - 71 goal was $31,000 and we had validated items totaling $2,734,300, which exceeded our goal by 8,820.5%. For the first time in its history, the Pacific GEEIA Region lead the other four Regions in this program.

ZERO DEFECTS PROGRAM

The participation by personnel of this Region has continually increased during the last four fiscal years as shown by the following figures. The exceptions indicated by the asterisks were the result of changes in criteria which have temporarily resulted in a decrease in these types of awards.

CARE FORMS	FY 66 & 67	FY 68	FY 69
Received	239	226	544
Approved	175	137	224
Disapproved	56	52	215
Pending	---	---	94

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AWARDS	FY 66 & 67	FY 68	FY 69
Gold	39	32	23*
Silver	147	111	236
Bronze	355	312	492
Group	---	37	28*

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CHAPTER III

SPECIAL PROJECTS

During FY 69, the Region continued implementation of many long-term projects and started many new ones. These projects involved the entire Region at one time or another; primarily, however, Engineering, Operations, Materiel, and the Maintenance/Installation (M/I) Squadrons and Detachments were the most deeply involved. Additional comments on some of these projects are contained in Chapter II under the Materiel Division.

Projects are arranged as follows:

a. Southeast Asia, including Thailand and Vietnam.

b. Taiwan.

c. Korea.

d. Others, including theater-wide projects, and others not in one of the above categories.

Note: Supporting documentation for the following project resumes' consists of written statements by the Project Monitor or Project Engineer. These written statements were edited by this author for readability and continuity. Where scheme numbers are used, no further reference is necessary since the scheme number provides a recognized reference for any further study.

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The majority of schemes developed for Vietnam and Thailand have been high-priority or emergency in nature but numerous delays were encountered in implementing those schemes due to delays or lack of approval for supporting structures. Cam Rann Bay is a prime example of lack of supporting structures being the cause of delay in implementing the cable scheme to cutover the new Central Office.[1] These extensive delays have resulted in the need for extensive scheme re-engineering due to the numerous continuous changing of base configurations in Vietnam.

A brief outline of some of the more important projects in SEA follows.

DIAL CENTRAL OFFICES (DCOS)

During FY 69, four projects for the expansion and/or initial installation of telephone Dial Central Offices (DCOs) were completed in SEA. These installations were a part of the complete Southeast Asia buildup of Air Force communications facilities at each base.

In the Republic of Vietnam, two projects were completed; at Nha Trang[2] a 1000-line expansion was installed; and at Phu Cat,[3] an initial 1500-line central office was completed.

In Thailand, Pacific GEEIA Region (PGR) completed two initial installations: a 600-line central office at Chiang Mai[4] and a 400-line system at Koke Kathiem.[5]

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SEA WEATHER NETWORK (FACSIMILE)

The original network consisted of 29 locations in Vietnam and Thailand. Since its original conception, many changes and problems have been encountered. Only two schemes remain uninstalled--0579A7K0 at Binh Thuy and 0960A9K0 at Tan Son Nhut. No 60 Hz power was available at Binh Thuy and 0960A9K0 was generated to replace an incompatible RD-217 recorder on scheme 0597A7K0 (Tan Son Nhut). Power for 0579A7K0 will be available in August 1969, and Headquarters GEEIA is determining type of recorder to be programmed under 0960A9K0. Nine schemes were cancelled by AFCS and eight schemes were leased and installed by the customer.

The main problem with this network was the fact that Defense Communications Agency (DCA) did not develop and release the circuit layout records (CLRs) until 1 February 1969. All the engineering was done without the CLRs.

The other main problem was that firm Site Concurrence Letters (SCLs) were not written and some were not coordindated on by the host base. After the CLRs were released, it was noted that impedance matching coils were required but not furnished in the scheme Tab A. Also, the US Army would not accept the type of delay equalizers furnished by GEEIA for installation in their Integrated Wideband Communications System (IWCS) sites. The US Army furnished and installed 15 delay equalizers that suited them and was reimbursed $21,000 by OCAMA. Sixty-four impedance matching coils were furnished for the whole network, including US Army IWCS and the naval facility at Saigon under 0597A7K2 (Tan Son Nhut). GEEIA installed the coils as required at locations where schemes were open and PAC Comm Area tasked their communications squadrons to install the coils at locations where AFTO Form 88's had been initiated. The US Army agreed to install GEEIA-furnished coils in their IWCS and in the naval facility. All coils have not been installed to date, but the network is operational except for Binh Thuy.

SEA WEATHER CEIPS 3QR000Y 7I28E AND 3QR000Y 6H29E

This program provides for engineering and installation of equipment necessary for updating the SEA Weather System from 60 words per minute (WPM) to 100 WPM and the installation of polling adapters and hubbing equipment. The system will consist of a dissemination network and polling network. The dissemination network consists of stations that are connected to the Weather Relay Centers with receive only capabilities. The stations on the polling network will have send and receive capabilities. The installation is being accomplished in two phases. Phase I installs teletype equipment at stations that were equipped with inadequate or insufficient equipment and changes the system to 100 WPM. Phase II consists of the polling adapters and hubbing equipment plus teletype

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equipment at stations not in receipt under Phase I.

PROJECT 972 FOC

During FY 68, there were 28 schemes assigned to install new teletype and secure voice circuits in SEA on a crash basis to satisfy "972" requirements. On some schemes, certain items of equipment could not be provided by the short target dates, and interim installations were made with substitute equipment. Subsequently, a contract was awarded to convert interim installations to permanent facilities and to make certain rearrangements which would permit a more efficient use of longhaul circuit paths.[6] Pacific GEEIA was also tasked to satisfy those engineering-installation requirements for the final operating configuration (FOC) not covered by contract.[7] These schemes were completed on schedule, thereby avoiding any delay to the contractor in the cases where concurrent installations were required.

PACIFIC AIR FORCE INTERIM AUTOMATED COMMAND AND CONTROL (PIACCS)

The program provided for implementation of the PIACCS Interim Operational Capability (IOC) between Hickam AFB and Tan Son Nhut AB with further implementation of Korat Concentrator Multiplexer Facility and 24 associated PIACCS terminals in Thailand, Vietnam, and Hawaii. The interim program was accomplished by a contractor who was responsible to engineer, furnish material, and install equipment

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at all locations. Some Government Furnished Equipment (GFE) was also utilized. Air Force responsibilities are: (1) Participate in site surveys. (2) Monitor contractor installations. (3) Participate in test and acceptance.

The Phase I communication group consists of 21 IBM 1050 low speed terminals, 3 IBM 1130 high speed terminals, 2 IBM 7740 communication control units, and a concentrator multiplexer at Korat. AFCS is the System Implementation Manager for this program. The system is presently being installed by the contractor and is being monitored by this Region. A total of 22 schemes[8] were to be installed under the IOC portion; of these, 21 have been completed and signed for with no exceptions. The contractor is now installing the final scheme. Four schemes[9] have been installed under the FOC portion and all are signed with exceptions to be cleared by the contractor. Present indications are that Phase II will not be implemented.

The PIACCS System Test and Acceptance evaluation was conducted during the period 12-21 May 1969. Upon conclusion of the test, it was determined that PIACCS was capable of passing a limited volume of operational traffic in support of Seventh Air Force and Headquarters PACAF by 1 July 1969.

<u>TRI-ATCO COMPLEX - DA NANG</u>

This communications facility will provide MAC ACP and ALCE HF/VHF/UHF communication capability plus weather

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teletype.

Schemes 0478A9K0, 0535T9K0, and 0881A6K0 have been cancelled since scheme 1055A7K0 for DSTE AUTODIN has been rescheduled for installation within the same time frame and will provide the required Comm Center functions.

Schemes 1074A6K0, 2210A7K0, and 2858A7K0 have also been cancelled due to resiting of equipment and necessary reengineering. Schemes 1110A9K0, 1111A9K0, and 1112A9K0 have been assigned to cover engineering efforts for a new SCL, Tab A and Tab B, as well as materiel and installation phases of this requirement.

The basic radio equipment has been relocated from the old MAC building to the TRI-ATCO complex on schemes 0024T9K0, 0371T9K0, and 0372T9K0. An interim teletype capability is being provided by an AN/TGC-20 van.

The remaining schemes are scheduled for completion during FY 370.

COMMANDO GLOW

AN/MPN-15A, Landing Control Central, was installed at Phan Rang on 18 December 1968 under scheme 0377A9K0. The unit was installed to provide area search radar scanning 360 degrees, covering a radius of 60 miles. Search employs frequency diversity dual transmitters and receivers to reduce the effects of lobing, paramp STC to reduce angle clutter, staggered PRF to reduce blind speed strength. In order to reduce radar ground clutter over the approach radials, a radar screening fence was constructed on a 167 foot arch from the 155 degree to the 239 degree radial. Installation started on 7 July 1968 and was completed on 18 December 1968.

Scheme 2874A7K0, AN/MPN-13 (SN 587) will replace the AN/MPN-15A installed under scheme 0377A9K0. Gilfillan has performed the Commando Glow modification on SN 587, which is presently in custody of the 2875th GEEIA Squadron for shipment to Phan Rang.

The AN/MPN-15A was removed from the hardstand on 6 June 1969 and the hardstand occupied by the AN/MPN-15A is presently being prepared to accommodate the AN/MPN-13 (SN 587) for installation. The installation of SN 587 is scheduled to start 30 June 1969 by the 485th GEEIA Squadron.

PHAN RANG RADIOS

GCA support radios and a pilot-to-dispatcher radio at Phan Rang, Vietnam, were engineered by CEM schemes 0172A8K0, 0191A8K0, 0984A7K0, and 1128A6K0. Although originally sited in a transceiver site, these schemes were re-sited into separate transmitter and receiver buildings to be provided under amended SCL requirements for scheme 1128A6K0. Concurrence to the re-siting and support requirements for the two new buildings was received in January 1969.

Further changes were necessary in schemes 0172A8K0, 0191A8K0, and 0984A7K0. Due to the substitution of an MPN-13 GCA for the MPN-15A MRAPCON at Phan Rang, these schemes would be providing an excess of radio equipment, and a cutback was recommended by Job Order Completion Report 3276E9K0. As a result, scheme 0172A8K0 was cancelled and schemes 0191A8K0 and 0984A7K0 were re-engineered with an amended SCL issued on 12 May 1969.

After completion of engineering for scheme 1128A6K0, it was learned from the 35th Combat Support Group that: (1) the two buildings originally concurred to had been cancelled; (2) Pacific GEEIA Region Operating Location (GEPE-1) had performed a site survey for a proposed communications building near the GCA; (3) three schemes involved should be re-sited into the proposed new building.

Over the past 12 months, more than 580 engineering manhours have been expended on this project, and it is expected that further engineering will be required.

TACTICAL SECURITY SUPPORT EQUIPMENT (TSSE)

Scheme 0344A9K0 was cancelled per GEEIA message GEO 191532Z Feb 69. Four schemes were assigned to replace scheme 0344A9K0. In addition, two extra schemes were assigned to install the PPS-5's. Trenching has resumed. The first sector (classified) is being completed under 0763A9K0 with an estimated completion of

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20 September 1969. Our engineer has just returned from the field after a site survey of two of the four follow-on sites.

PEACE GRAY

This program is to provide 400-line dial central office at Headquarters VNAF and 50-line switchboards at Bien Hoa, Binh Thuy, Nha Trang, Da Nang, and Pleiku. Also, a 20-line switchboard will be provided at Dalat. We have been tasked with added requirement to fabricate and install 7 radio consoles at all the 7 sites below. No schemes have been assigned to date. The following schemes are assigned for the 50- and 20-line switchboards:

Scheme	Base
0434A9K0	Tan Son Nhut
0818A8K0	Bien Hoa
0819A8K0	Binh Thuy
0820A8K0	Nha Trang
0821A8K0	Da Nang
0822A8K0	Pleiku
0824A8K0	Dalat

PACER DOG

This program will provide 505 Tactical Control Group with 4 each AN/FPS-90 Fixed Height Finders. The schemes and locations are as follows:

a. 2940A7K0 - Nakhon Phanom, Thailand - Completed without exceptions 16 September 1968.

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b. 2941A7K0 - Pleiku, Vietnam - Completed 10 January 1969 without exception.

c. 2942A7K0 - Hon Tre, Vietnam - FSD 270, ERD Dec 68A, MRD Feb 69A, IRD Dec 69, CCD 15 Jul 69.

d. 2943A7K0 - Ban Me Thout, Vietnam - FSD 270 requested, ERD Jul 68A, MRD Jun 69A, IRD Sep 69, CCD Jun 69.

Scheme 2942A7K0 - All the allied support for this scheme is completed. Outside plant augmentees are presently at Hon Tre for scheme 0315A8K0, installation of a rigid radome. Upon completion of this scheme (ICD 30 June 1969), they will start 2942A7K0. Scheme 2943A7K0 is presently in HIA until a decision is made on the restriction that MACV has placed on the operation of AN/FPS-90 and the possible RFI problem.

TAC CONTROL SYSTEM 834 AIR DIVISION ALCE

This program is to provide both UHF and VHF ground-to-air radios for the 834 Air Division ALCE network throughout the RVN.

CEIP 2NFA11R5/7F30E was subdivided into 12 schemes and placed into the system on 22 January 1967. The schemes assigned were 2945A7K0 through 2956A7K0. Under the original requirement, 5 schemes were to provide only 2 channels of VHF, and 7 schemes were to provide 2 channels of VHF and 1 channel of UHF. Since that time, the requirement for UHF on scheme 2947A7K0 has been cancelled

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leaving 6 schemes providing VHF only. Site surveys for this program were accomplished in October and November of 1967, and original engineering products were dispatched between February and July of 1968. This program was progressing satisfactorily until December 1968 when the 485th GEEIA Squadron performed an in-house review on 3 of the 12 schemes assigned. This review revealed problems common to all 12 schemes, and it was determined that schemes would have to be re-engineered to be compatible for installation. The major problem confronting the program was that the C-2767 control unit had been called out but the C-2767A had been shipped under the same BOM number making it impossible for anyone to know that a problem existed until the in-house review was performed. As a result of the discrepancies found, K1 schemes were assigned to accomplish re-engineering and call-out of additional minor items. Under the K1 scheme, the engineer called out the C-7070/G to correct the interface problem that existed due to the C-2767A being shipped rather than the C-2767. Schemes were again progressing satisfactorily, and it appeared that we would meet the FY 370 FSD; however, in May, Headquarters GEEIA advised that the lead time for the C-7070/G was approximately 12 months and suggested that we consider using the SB-270's as a substitute. This substitution was discussed with the engineers at that time, and they informed us that the

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SB-270's would work, but it would necessitate re-engineering. At this time, we went back to Headquarters GEEIA and requested we be provided the C-7070's. As a result of this action, Headquarters GEEIA placed a 271 FSD on this program. On 30 June 1969, a Phasing Group Meeting was held at this headquarters with representatives from GEPOIR, GEPEERC, and CINCPACAF (DEPPB). In this meeting, the situation confronting the program was explained to the customer and all alternative routes of action were explored. It was decided that we would provide the customer with both a realistic lead time for the C-7070/G's and an estimate for re-engineering for the SB-270. A message has been sent to Headquarters GEEIA asking them to provide us with the EDD of both the C-7070/G's and the SB-270's and Engineering will provide an estimate of lead time for engineering. Based on this information, the customer command will decide which alternative they desire.

<u>SEEK SILENCE</u>

The purpose of the Seek Silence Program is to provide secure voice capabilities for UHF facilities in support of operations in SEA. This program was initiated in 1966 and the first installations began in March 1968 at Cam Ranh Bay. There are 48 schemes assigned to this project which are either completed or nearing completion. It was determined at that time that modifications were required for the radios associated with the crypto equipment to be installed by this program. The modification kits were procured by the customer through OCAMA, and the long lead time for the manufacture of these kits delayed any further installations under the Seek Silence Program until 1 July 1968 when scheme 0719A7K0 at Bien Hoa began its installation phase. The installation of scheme 2702A7K0 at Da Nang and 0734A7K0 at Nha Trang followed shortly after the completion of scheme 0719A7K0 and began an upward trend in the installation phase of the Seek Silence Program. As of this date 33 schemes under this program have been completed. Although the majority of the schemes have been completed, many manhours have been expended by Pacific GEEIA Region and its customer resolving the problems which arose while awaiting the modification kits for the associated radios. Problems such as re-engineering due to changes in command requirements, unauthorized relocations, newer buildings replacing the older structures where these schemes were to be originally installed, losing reserved space and deterioration of material in the field have caused the loss of many valuable manhours and a large amount of damaged material at the expense of the Air Force. There are presently 14 schemes remaining to complete this program. Of these schemes, 3 will start installation in the FY 469 and the other remaining schemes will be delayed due to problems involving allied support, re-engineering, re-supply of material, reprogramming of associated radios and suitable locations for the equipment. Although we have narrowed down the number of remaining schemes considerably, and still have numerous problems to be resolved, we expect all but two schemes to be completed within FY '70. Very few personnel were sent TDY to assist the squadrons on this project. This can be attributed to the early foresight of the Region and Headquarters Program Managers to specially train squadron personnel at an early date in the installation of the Seek Silence equipment.

Under Job Order 3208E9K0, a desk study was undertaken in November 1968 to engineer a system based on a new concept for the Seek Silence Program. This system will incorporate new technological advances and will provide the operating agencies with more flexibility and operational capability. The bulk of this work will be completed in early FY 70.

THAILAND BUILDUP

The continuing buildup of bases in Thailand has resulted in extensive Base Wire Communications Plan (BWCP) programs being developed on the eight bases on which BWCP packages are prepared. Most schemes developed have been assigned as emergency due to the rapid base buildup and necessity for supporting such systems as AUTOVON, AUTOSEVOCOM, and other high speed data circuits requiring special cable considerations.

KAMPHAENG SAEN RTAFB

A complete base telephone plan was engineered for the new RTAF base at Kamphaeng Saen. Since that base was to be an entirely RTAF facility, built especially for the RTAF, additional engineering effort was necessary in coordinating our plant engineering with the RTAF officials for their concurrence and approval. Contract engineering services were utilized to accomplish the outside cable plant engineering for Kamphaeng Saen. A total of 12 CEM facilities were engineered and installed at Kamphaeng Saen by Pacific GEEIA Region.[11]

PACAF COMMAND AND CONTROL SEARCH AND RESCUE SSB SYSTEM

Pacific GEEIA Region was tasked with the engineering and installation of this system with Seventh Air Force providing allied construction.

The system will provide HF/SSB radio point-to-point ground/air communications which are necessary to control search and rescue operations in Southeast Asia.

Four schemes have been assigned to engineer and install the Sub-Rescue Coordination Centers at Nakhon Phanom RTAFB[12] and Tuy Hoa AB[13] and the Rescue Coordination Center at Tan Son Nhut AB.[14]

To date, the following has been accomplished:

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a. Engineering has been completed for the Nakhon Phanom RTAFB Sub-Rescue Coordination Center.

b. CEIP assistance and site survey have been completed for the Rescue Coordination Center at Tan Son Nhut AB.

c. Site survey has been conducted for the Sub-Rescue Coordination Center at Tuy Hoa AB, RVN.

The engineering completion dates for these facilities are 30 September 1969.

TACAN SCREENING

The dual TACAN facility at Ubton RTAFB, Thailand, was installed under scheme 0778A5K0 and repeatedly failed commissioning flight checks. Many months of efforts to improve the equipment operation proved fruitless. In February 1969, an engineer arrived on site and after extensive analysis determined that the out-of-tolerance conditions could be eliminated by building screens to block unwanted TACAN ground signal reflections into the runway approach area. This technique had previously never been tried in this Region. After building three screens to cover a ten degree sector, the facility was able to pass a flight check on 8 March 1969.

This screening technique was subsequently used at Takhli RTAFB by an engineer from GEPE-1 (O/L) and was so successful that 7th/13th Air Force has abandoned a plan to change out all antennas of a certain type known to

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cause these unwanted ground reflections. Engineering effort is continuing to design standard screens which will permit on-site testing for optimum placement on a site-by-site basis.

INTEGRATED COMMUNICATIONS SYSTEM - THAILAND

Pacific GEEIA's participation in the Integrated Commdnications System (ICS) was, for the most part, completed during FY 69. As a bit of background, ICS provides backbone communications throughout Thailand using all modes in the troposphere, including forward scatter, diffraction, and line-of-sight. Early in the program, the decision was made to give the US Army the responsibility for administering the contract for all of ICS, but it was also decided that after implementation the Air Force would assume responsibility for several of the sites. In order to provide Air Force representation on the acceptance testing for the Air Force sites, Pacific GEEIA sent a project monitor to work with Army STRATCOM during the test period, and the 2875th GEEIA Squadron assigned a team of airmen to the project monitor. The testing, which was performed by the contractor, Philco-Ford, was supervised by STRATCOM using a contract with RCA to provide test personnel. Pacific GEEIA personnel worked with the RCA test team members at the Air Force-responsible sites. As data was collected by the contractor, it was passed to STRATCOM for joint evaluation with the

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Environmental Science Services Administration (ESSA), RCA, and Pacific GEEIA.

During FY 69, the testing program continued with Link Conditional Acceptance Tests (LCATs) being completed on all constructed sites. All three routes of the system were then completed and evaluated.

The system testing was sufficiently successful to allow the Air Force to assume responsibility for its sites, and Pacific GEEIA Region's participation on this portion of the program was completed.

SEAITACS - CEIP 2NF000R(2) 6J01E

This program provides secure communications for an Integrated Tactical Air Control System (ITAC) for (SEA) Thailand. It will also be compatible with SEA Integrated Wideband Communications System (IWCS). Change in original programs to relocate the TACC function from Korat to Udorn has caused considerable delay. Numerous manhours were expended and wasted due to changes for this requirement; however, AF Form 524, CSO 69-3014, was assigned for new program actions to configure Udorn TACC from terminal to relay type equipment. (Scheme 0811A9K0-XMTG-K-6000 applies.) Site survey was completed 13 June 1969; FSD 470.

Twelve schemes were originally programmed as tributaries off the Korat TACC. Three schemes assigned to the original remained active with FSD 170. One scheme was completed 19 June 1969. CSO 69-3008 and 69-3004 have

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been effected to support adoption of JANAP modification for Bendix AMASS/MAPU. Requirements were reviewed jointly by CINCPACAF and Headquarters GEEIA (GEOCC/GEETS). Milestones are now pending, awaiting final determination on modes of operation.

KORAT PAFCO RELAY CENTER

The PAFCO Relay Center at Korat RTAFB, Thailand was installed with on-site engineering assistance under scheme 1057A6K0. Due to the urgency of the customer's requirements, installation-engineering was undertaken in spite of the non-availability of adequate technical data. As a result, numerous engineering problems were encountered during installation, such as:

a. Preliminary tech data differed from final production models.

b. Relay equipment such as the AN/GGR-1AX and AN/GGR-2AX required low-level modification kits which were still in the design stage.

c. In the case of the AN/GGT-3AX, no modification kit existed at all. Pacific GEEIA fabricated an external conversion kit.

d. The Bendix Automatic Multiple Address and Segregating System (AMASS) 101B is a high-speed digital segregator designed to automatically route messages to 30 high-speed punches (2000 WPM). The particular unit that was received was an early production model and required many on-site engineering modifications.

These and many moro problems were resolved during the engineering-installation.

It is anticipated that the Korat facility will be fully operational by October 1969.

COMMANDO HUNT

Emergency on-site engineering with a 1-4 priority was requested on 31 October 1968 by Seventh Air Force to relocate and expand the Combat Operations Center at Nakhon Phanom RTAFB, Thailand. This work was performed under Job Order 3200B9K0 and scheme 0683T9K0. The task included not only relocation of four operating positions, but also extensive reconfiguration and expansion to 10 operating positions. The target date was ASAP. An entineer in Southeast Asia was diverted to Nakhon Phanom and completed preliminary engineering within two weeks. Additional time was spent on-site engineering which included coordinating the flow of materials from multiple sources, fabricating material that could not be obtained on a timely basis, supervising 12 installers who were hurriedly dispatched from the 483rd and the 2875th GEEIA Squadrons, and constantly changing the engineering design as requirements were redefined and materiel became available. The persistent and successful efforts of all those concerned resulted in the check out and hot cutover of the facility by 23 December 1968, well within the

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conservative estimates of actual completion.

COMMANDO FORGE

Emergency GEEIA assistance was requested by 7th Air Force to provide secure air-to-ground voice communications at Nakhon Phanom RTAFB, Thailand. An operational facility would be required within 72 hours pending a deployment order by USAF.

An engineer arrived on site and under Job Order 3394B9K0 determined the operational requirements, advised Headquarters Pacific GEEIA Region of the materiel required, and worked with installers from the 483rd GEEIA Squadron to complete as much of the installation as possible. The detailed site engineering accomplished by 22 March 1969 permitted Pacific GEEIA Region to complete the installation within the 72-hour limit imposed by the actual deployment order. The successful completion of this project earned Letters of Appreciation for all those involved in the high priority task.

SECONDARY TRUNKING AND TANDEM SWITCH

Since the secondary trunking concept was proposed in June 1967, engineering work has been performed to make the concept a reality. The basic plan is to provide additional trunking to Air Force Dial Central Offices in Tandem Switch areas. During FY 69, the Dial Central Offices were surveyed, lists of materiels were written, and installation instructions provided.

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Outside plant cable support to the Tandem Switch facilities installed in Vietnam and Thailand consisted primarily of providing high quality cables from the Dial Central Offices to the Tandem Switch facility. This program was a USASTRATCOM project and Pacific GEEIA provided cable support at Tan Son Nhut AB,[16] Pleiku AB,[17] Da Nang AB,[18] and Nha Trang AB,[19] Vietnam. Bases requiring Tandem Switch cabling in Thailand were Korat RTAFB[20] and Ubon RTAFB.[21] All cable to serve this system has been installed and signed off during this fiscal year.

PROJECT PEACE BIRD

Seven schemes and one job order for the upgrading of the Air Traffic Control System at Tainan AB and Ching Chuan Kang AB, Taiwan, were assigned to Engineering on 1 February 1969.

a. Scheme 0814A9K MLTX provided for the installation of automatic transfer equipment for a previously installed AN/URN-5 radio beacon.

b. Scheme 0815A9K0-MLTX provided for the installation of UHF/VHF air/ground communications for the control tower.

c. Scheme 0816A9K0-MLTX provided for the installation of two each ten-channel recorders (TR-1510) for the control tower.

d. Scheme 0817A9K0-MLTX installed AM-864 audio amplifiers for the control tower circuits.

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e. Scheme 0818A9K0-WQPC provided for the installation of one audio amplifier (AM-864) for the control tower of Tainan AB. The SCL was dispatched 3 March 1969; however, the scheme was cancelled 15 May 1969.

f. Scheme 0819A9K0-WQPC provided for the installation of UHF/VHF air/ground equipment in the control tower.

g. Scheme 0820A9K0-WQPC provided for the installation of two each ten-channel recorders (TR-1510) in the control tower.

h. Job Order 3304B9K0-MLTX. A feasibility study was performed to determined the requirements for a VORTAC facility. Engineering was completed 27 March 1969 indicating such a facility could be established.

Due to the extremely high interest in this project by CINCPACAF, a 25 June 1969 implementation date for Ching Chuan Kang AB and 20 September 1969 date for Tainan were established. Engineering actions were expedited to the extent that engineering for the entire program, including site surveys, on-site dispatch and indorsement of SCLs, on-site preparation of Tab A's, and Tab B's, were completed within a period of 77 days.

Selected Mobile Depot Maintenance (MDM) is also part of Peace Bird and is documented by Work Order Numbers 5228L9K0 and 5245L9K0.

SAC SEA REQUIREMENTS - CHING CHUAN KANG (CCK)

This emergency two-phase program provides SAC with a secure voice facility at CCK, Taiwan.

Pacific GEEIA Region's initial tasking for Phase I of this program was provided on 31 January 1968. At this time, a job order was assigned for engineering review.[22] Funding estimates along with scheme assignments were forwarded to Commands on 16 February 1968; however, due to the limited preliminary information, confusion existed at Headquarters GEEIA and this Region as to the division of responsibilities for CEIP implementation. The necessary information required for appropriate engineering and implementation in February was not provided by SAC until 30 March 1968. As a result, four additional major items had to be programmed, new schemes assigned and re-engineering was required. The time, money, and programming efforts expended for travel to locations were lost as a result of poor coordination between using command and operating squadron. For example, two schemes assigned to provide a duplex teletype configuration was discovered to be in full operation by Pacific GEEIA Region engineer upon his arrival for site survey. The Phase I requirements for this program were completed in May 1968. Phase II was implemented in October 1968 with one scheme assigned[23] for this requirement. The progress of this phase has been retarded due to lack of definition (primarily in the area of configuration, type and quantities) of equipments to be procured. Presently, AFLC has this scheme placed in HIA status due to anticipated fund overrun.

ILS

This program will provide an Instrument Landing System (ILS) to insure safe and expeditious landing of combat and logistical support aircraft at Ching Chuan Kang AB, Taiwan. The facility consists of an AN/MRN-7 Localizer (azimuth) and an AN/MRN-8 Glideslope (elevation) equipment, plus a Middle Marker (75 MHZ Marker Beacon) and Outer Marker (75 MHZ Marker Beacon). The Outer Marker is to be colocated with the existing Low Frequency Radio Beacon. The Chinese Air Force (CAF) presently owns the facility housing the LF Radio Beacon. The Middle Marker is to be located in an existing CAF building located on a Chinese Army camp. Two schemes have been assigned, one for interim installation (0509A9K0) and the second for the permanent (0917A9K0). Cable scheme 0719A9K0 was assigned and has been completed.

This program has extremely high level interest from CSAF on down. Maximum GEEIA effort is being made to expedite this job. The facility will be completed in two phases: Phase I - Interim installation (CEM scheme 0509A9K0) and Phase II - Permanent installation (CEM scheme 0917A9K0). FAA flight check revealed that RFI problems existed to the extent that it produced a definite hazard to flying

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safety. Pacific GEEIA RFI engineering team and equipment were dispatched to locate the source of interference. It was determined that interference was originating from civilian sources nearby where plastic welding machines were being operated. Interference was strong enough to prevent commissioning of facility. Meetings with plastic factories to conduct seminars on RFI prevention techniques are presently in progress. Get well date at this time is unknown and is dependent on resolution of RFI problem. (See also comments in Chapter II under Engineering Services Branch.)

A/G COMMUNICATIONS IN SUPPORT OF SEA

This program will provide permanent extended range UHF/VHF radio communications. This radio equipment will be installed at Feng Liao, Taiwan. The phasing was as follows:

a. Phase I (C) 3QLROOR(5), 8D02E, CEM scheme 0828A8K0-GPSA-N-2210 (original FSD 269, present FSD 270). FSD 370 was requested based on CCD slippage to October 1970). Pacific GEEIA Region engineer completed a site survey in September 1968 and by November 1968 all Pacific GEEIA Region engineering efforts had been completed. Material is 100% available.

b. Phase II Emergency CEIP 3QLROOR(6) Amend 8J26E CEM scheme 0688A9K0-FQAW-N-2210 (original FSD 469, present FSD 270). FSD FY 370 requested based on CCD slippage of

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basic scheme 0828A8K0. Originally a March 1969 delivery of the second 242C-1 transmitter was estimated. This has slipped to August 1969.

c. Phase III Emergency CEIP 3QLR00R(6) Amend 8J26E CEM scheme 0689A9K0-FQAW-N-2210 (original FSD 469, present FSD 270). Request for FSD FY 370 will be submitted on CCD slippage of basic scheme 0828A8K0. July 1969 delivery of additional equipment programmed to provide required backup capability has slipped to September 1969.

This program has been continually plagued with allied support problems in Phase I, and manufacturer's delay in supplying the 242C-1 transmitter for Phase II and 242C transmitters and GRR-23 receivers for Phase III. These two major problems have caused slippage in the entire program.

KOREA BUILDUP

Following the Pueblo Incident, great emphasis was placed upon the telephone plant systems throughout Korea. Base Wire Communications Plan surveys were expedited for bases at Osan, Kunsan, Kimpo, Taegu, Kwang Ju, and Suwon, and extensive replacement if not complete rebuilding of the telephone cable and telephone plants was initiated. The schemes resulting from the Korea Base Wire Communications Plan packages were all placed in the high priority category and engineering was accomplished by contractor services. Base delays in providing supporting structures

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have delayed installation of the priority schemes, although engineering is complete and materiels are reportedly on hand.

BLUE FORTUNE

Philco-Ford (contractor) engineered, furnished, and installed multi-channel radio links terminating at 12 geographical locations within the Republic of Korea.

The communication facilities provided by this project interconnected with existing communications facilities to insure that there was an integrated ROKAF AC&W communications system.

The project was accomplished in to phases:

a. Phase I (southern sites) consist of terminal locations of radio links at the following sites: Kunsan, Uisong Bong, Pal Gong San, Taegu AB, Taegu ARTCC, Taegu Relay (MatCon), and Kwanju AB.

b. Phase II (northern sites) consist of terminal locations of radio links at Kangnung AB, Pyongtach AS, Mangil San, Irwol San, and Yong Mun San.

PEACE FORTUNE PHASE I

This program is for upgrade and addition of 56 microwave channels for Project Blue Fortune. The contract has been let and copies have been received by this headquarters. We have been tasked to provide GEEIA Field Inspection Representatives (GFIRs) for test and acceptance of this project. Philco-Ford has indicated that they plan

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to start 1 September 1969 and complete 30 November 1969. We have asked for a firm schedule so we can assign schemes.

PEACE FORTUNE PHASE II

This program is for the over-all expansion of the existing Blue Fortune microwave system. We have been tasked to provide an Engineered Requirements Plan (ERP) in accordance with AFM 400-19. Job Order 3396B9K0 applies. Estimated Completion Date is September 1969.

ROCK TOP/TOP LEVEL/PERIMETER SITES

This three-fold project was finally completed during FY 69 after a life cycle of over four years. (See Appendix 2.) It provided an improved air defense radar capability for the Republic of Korea. This massive project, accomplished entirely by GEEIA organic forces, involved eight separate locations in some of the most inaccessible parts of South Korea. The Rock Top project covered two entirely new sites at Pal Gong San and Uisong Bong which were completed in March and February 1968, respectively. The Top Level project included facilities and modernization of existing facilities at Mangil San (completed November 1967), Yong Mun San (completed February 1968), and Irwol San (completed October 1968). The Perimeter Sites modernization involved three sites: Cheju-do (completed November 1968), Kangmung (completed November 1967) and P-Y-Do (completed May 1968).

PROJECT PACER TOWN

Project Pacer Town was assigned to restore facilities damaged when Typhoon Della struck Miyako Jima and Kume Shima on 22 and 23 September 1968.

Radar search antennas, rigid radomes and air/ground antennas and poles at both Miyako Jima and Kume Shima were destroyed. Detachment 2, 2875th GEEIA Squadron, was tasked by PACAF (DEMR) to provide restoration to damaged equipment and responded on 24 September 1968 by starting antenna farm rehabilitations and surveys of AC&W equipment damage. An interim restoration of antenna farms was completed on 31 October 1968.

A meeting was held on 17 October 1968 with SMAMA, PACAF, 51st Fighter Intercepter Wing, and Pacific GEEIA Region personnel at Okinawa to determine the order of priority for restoration of facilities.

Two CW-396A radomes arrived at Naha on 21 November. Both sets were inventoried and found to be short items. One radome was made up for Kume Shima with three items short.

On 4 December 1968, one FPS-93A search radar sail shipped unprotected arrived Naha broken. Repair was made on-site.

During the last week of November, some of the requisitions for height radar requirements were inadvertently cancelled by the SMAMA computer. Items were re-requisitioned

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on 4 December 1968.

Installation of Kume Shima search radome started on 20 December 1968. Winds were forecast for 30 knot maximum. On 22 December, 75 knot winds damaged 122 radome panels. The panels were reordered. This installation was completed on 30 December 1968. Pacific GEEIA personnel and Century Company (painting and caulking contractor) reported the radome to be in bad shape.

Height radome arrived for Kume Shima, was inspected on 6 January 1969. Found 150 bad panels. Radome was reordered 13 January 1969.

Kume Shima search radar was commissioned on 13 January 1969. Miyako Jima search radome installation completed on 28 January 1969. Miyako Jima search radar was commissioned on 2 February 1969. On 21 February 1969, Kume Shima height radar azimuth drive assembly was found to be unserviceable upon arrival from SMAMA. Improper packing permitted rain water to enter and rust gears. A replacement was obtained by PACAF from 1st Mobile Communications Group assets.

Miyako Jima height radome installation was completed 26 March 1969.

An inventory of Kume Shima height radome accomplished on 6 March 1969 revealed 156 unserviceable panels. Century Company was tasked by SMAMA to determine if panels can be repaired locally. The height finder at Miyako Jima was commissioned on 20 March 1969. Kume Shima height finder was commissioned on 22 March 1969.

The entire project was completed on 25 April when Century Company completed caulking and painting of the last radome.

On 27 May an inspection was made of the Miyako Jima radomes. The radomes were deemed to be in bad shape as rain had left several inches of water on the floor and numerous cracks appeared in the radomes.

A team representing PACAF, Pacific GEEIA Region, and Detachment 2, 2875th GEEIA Squadron, made a survey of the radomes. The survey of the radomes was completed on 30 June 1969. It was recommended that the four radomes at Miyako Jima and Kume Shima be changed out for new radomes developed to withstand 200 knot winds or use of new CW-396A radomes.

KOREAN NAVAIDS UPGRADE

The Korean Navaids Upgrade project provides for the upgrade of the Korean Air Force Navaids facilities to USAF specifications.

The project commenced in October 1968 when the 2875th GEEIA Squadron went out under emergency Workload Identification Numbers (WINs)[24] to survey the TACANs, GCAs, and radio facilities at Taegu, Kwang Ju, and Suwon. The surveys were completed in November and BOM was ordered. Routine WINs were assigned at this time for the completion of IRANs. The radio facilities caused no problems and were completed promptly by April. The BOMs for the TACANs still have not been completed and therefore these jobs have not started as yet. A GCA team from the 2875th GEEIA Squadron went to Taegu on 7 April to IRAN the GCA at that site. Due to the delay ROKAF had in procuring parts and additional deterioration of the unit, this job was not completed until 20 May, 15 days behind schedule. The team then went to Kwang Ju and started IRAN on the MPN-11 on 2 June. This IRAN is scheduled to be completed 15 July 1969. The team will then proceed to Suwon to IRAN their MPN-11. The prime problem is supply support from the ROKAF.

CCTV WEATHER BRIEFING FACILITY

CEM scheme 0553A6K0-DVLK-5062-V provided a CCTV Weather Briefing Facility for 21 subscribers on Clark AB. Engineering for this scheme was completed in November 1967. All major and minor items for the scheme were available on base in June 1968. However, the scheme was not installed due to non-availability of base support. In November 1968, an emergency CEIP amendment was submitted in an attempt to reduce base support requirements. The subscriber net was reconfigured in an attempt to reduce the number of video-audio cable runs required. The CEIP amendment was approved for implementation on 12 February 1969. A site survey was completed in May 1969, and the amended SCL is scheduled for distribution in July 1969. Engineering for this project should be complete by September 1969.

LUZON INTERCONNECT

Pacific GEEIA was tasked by PAC Comm Area to provide technical assistance for the expansion and upgrade of the Luzon Interconnect System.

This system is the US Forces microwave communications network at Luzon, P.I., and is composed of facilities procured under the Ridge Rope (Navy), Speed Queen (USAF), and Wet Wash (USAF) programs. The expansion and upgrade will provide additional channels to support Naval requirements at Subic Bay and USAF circuit backup requirements for Dau - Camp O'Donnell, as well as to improve all marginal microwave links.

Under Job Orders 3340B8K0 and 3228E9K0, Pacific GEEIA has provided the following assistance: A breakout of multiplex equipment requirements, a patch study of the problem links, recommendations for upgrade of the problem links, budgetary estimates for the cost of the program.

GCA PANEL FABRICATION - WIN 6034J9K0

A world-wide requirement existed for 228 replacement panels for 26 AN/FPN-16's. GEEIA was tasked by Headquarters AFLC with meeting this requirement. In-house fabrication of panels at the 2875th GEEIA Squadron, Tachikawa AB, Japan, started in August 1968. Nineteen of these requirements have been met. During this tasking, numerous support problems arose. These were primarily requirements for extrusions and rivets. Our present estimated completion date is 31 July 1969.

RWOS - WIND SYSTEM SURVEY

Pacific GEEIA Region was tasked by Headquarters GEEIA to perform RWOS Wind System Surveys of AWS wind systems to determine the total quantities and locations where four and 8 position relay panels are installed.

It was predetermined what locations required these surveys before the squadrons were tasked. A report format containing the survey criteria was developed and a complete package was forwarded to each squadron. The 2875th, 2876th, 483rd, and 485th GEEIA Squadrons were tasked to perform these surveys in conjunction with other scheduled visits, where possible. There were 36 locations, 10 for the 2875th GEEIA Squadron, 4 for the 2876th GEEIA Squadron, 6 for the 483rd GEEIA Squadron, and 16 for the 485th GEEIA Squadron. The 485th completed all their surveys by June 1969; the 2876th has one remaining; 2875th has two remaining; and the 483rd has four remaining.

The survey included but not limited to the following: Complete plant-in-place records, general construction, local building practices including cost per square foot, cost per square foot of non-glare thermopane, list of all nomenclatured, un-nomenclatured and commercial

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equipment, primary and emergency power, whether or not the control tower was FAA or AFCS operated. Also required was latitude, longitude, elevation (barometer), average snow depth, mean frost level, and soil conditions, etc.

EMERGENCY ACTION CONSOLES (EAC)

The Emergency Action Consoles (EAC) required expansion at Fuchu AS, Japan, Kadena AB, Okinawa, and Clark AB, Philippines, during FY 69.

In order to provide adequate fulfillment of these requirements for the three expansions and additional terminals that developed, a total of 17 schemes were assigned,[25] engineered, and installed. The successful completion of these schemes has provided Fifth Air Force and Thirteenth Air Force with a better, more flexible Emergency Action Console System for the accomplishment of their mission in the Pacific Theater.

JOSS QUICK FIX PROGRAM

The JOSS Quick Fix Program was initiated to provide signalling equipment for all military switchboards connected with Joint Overseas Switches in Korea, Japan, Okinawa, Taiwan, Guam, and the Philippines. This highly important signal equipment provided for operator circuit supervision and was necessary for AUTOVON cutover.

Pacific GEEIA Region assumed the responsibility for 16 bases and as a result 16 schemes[26] were assigned and engineered to fulfill the requirement. During FY 69, 15 of the schemes were completed on schedule. Although not of an extremely complicated nature, these schemes required continuous supervision and monitoring due to the equipments being furnished by the Army. Extreme caution was exercised in assuring the compatibility of the Army-supplied material with the existing Air Force systems.

CENTRAL OFFICE EXPANSION

Because of the increased activity in Korea, Central Office expansion was necessary for various Korean bases. The following schemes were completed in engineering to meet these expansion requirements:

Scheme	Location	Description	Remarks
0588A9K0	Kwang Ju AB	400 Line Add	Completed May 1969
0589A9K0	Suwan AB	400 Line Add	Completed May 1969
0590A9K0	Taegu AB	400 Line Add	Completed June 1969
0596A9K0	Kunsan	1500 Line DCO	Completed June 1969
0598A9K0	Osan	500 Line Add	Awaiting SCL Indorsement Only

In addition to Korea, bases in Southeast Asia and Okinawa required Central Office expansion.

Scheme	Location	Description	Remarks
0801A9K0	Udorn	500 Line Add	Completed June 1969
0794A9K0	Kadena	800 Line Add	Completed April 1969
0510A7K0	Pleiku	1000 Line Add	Completed Feb 1969
0516A9K0	Bien Hoa	1000 Line Add	Completed Feb 1969

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AUTOVON

The Pacific portion of the Overseas AUTOVON Program (490L) is to provide access to the world-wide AUTOVON network through the installation of six automatic switching centers in the Pacific Theater, two of which are the responsibility of Pacific GEEIA Region: Dau (Clark AB), Philippines, and Fuchu AS, Japan. In addition, Pacific GEEIA Region has the responsibility for installing the telephone central office modifications that will allow access to the system by all validated subscribers on each air base.

AUTOVON has commanded much attention during FY 69 with engineering being performed for Cuts I, II, and III.

a. Cut I. The Wahiawa, Hawaii, switch became operational on 1 March 1969. To support this, the Inside Plant Section completed engineering and provided installation assistance for the following locations:

(1) Hale Makai, Hawaii - Four-wire subscriber equipment was installed. This equipment provides the subscriber with direct, dedicated access to the AUTOVON switch.

(2) Hickam DCO, Hawaii - PBX trunking was installed to provide two-wire subscribers with AUTOVON access. Thus, designated two-wire subscribers can gain access by dialing a certain prefix number.

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(3) Johnston Island - Both four-wire subscriber equipment and PBX trunking equipment were installed. The configuration for PBX trunking for Johnston Island is slightly different than Hickam as the two-wire subscriber must go through the switchboard to gain AUTOVON access.

(4) Clark AB, P.I., and Fuchu AS, Japan - Linkings of the JOSS switchboards to AUTOVON were completed with nine JOSS trunks for Clark and six JOSS trunks for Fuchu.

All equipment installed for Cut I is in operational use.

b. Cut II:

(1) Subscriber equipment associated with the Dau AUTOVON switch in the Philippines and with the Finegayan Bay AUTOVON switch on Guam is scheduled for operational cutover on 1 November 1969.

(2) The Inside Plant Section is responsible for engineering equipment for four-wire subscribers. To fulfill this responsibility, on-site engineering was performed at Clark AB, scheme 0620A6K0; John Hay AB, scheme 0621A6K0; Andersen AB, scheme 0627A6K0; Quezon City, scheme 1572A7K0; Mactan, scheme 1573A7K0; and Tan Son Nhut, scheme 0317A9K0.

(3) In addition to four-wire subscriber engineering, the Inside Plant Section was tasked to provide engineering for Blue Eagle, EAC, Priscilla Ellen, and Echo suppression equipment at Fuchu and Clark AB.

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c. Cut III: The cutover of the Grass Mountain, Taiwan; Fuchu, Japan; and Futenma, Okinawa; switches is scheduled for March 1970. Engineering is presently nearing completion for the following schemes associated with Cut III:

Scheme Nr	Location	Description
0906A5K0	Kadena	PBX Modification
0907A5K0	Naha	PBX Modification
2229A7K0	Tainan	PBX Modification
2230A7K0	Osan	PBX Modification
2231A7K0	Kunsan	PBX Modification
2233A7K0	CCK	PBX Modification
0546A6K0	Taipei	PBX Modification
0611A6K0	Yokota	Four-Wire Subscriber
0612A6K0	Tachikawa	Four-Wire Subscriber
0613A6K0	Fuchu	Four-Wire Subscriber
0615A6K0	Misawa	Four-Wire Subscriber
0617A6K0	Itazuke	Four-Wire Subscriber
0618A6K0	Kunsan	Four-Wire Subscriber
0619A6K0	Osan	Four-Wire Subscriber
0622A6K0	Taipei	Four-Wire Subscriber
0624A6K0	Kadena	Four-Wire Subscriber
0625A6K0	Naha	Four-Wire Subscriber
0626A6K0	Okinawa	Four-Wire Subscriber

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AUTOVON - FUCHU AIR STATION, JAPAN

The combined efforts of Automatic Electric Company, Page Communications, Philco-Ford, Collins Radio, Stromberg Carlson, Hawaiian Telephone Company, Nippon Electric, and Pacific GEEIA have resulted in a joint undertaking to unify major AUTOVON Technical Control facilities, thereby implementing a world-wide common user network. In preparation for Cut III of AUTOVON siwtch activation scheduled for 1 March 1970, GEEIA has been tasked to consolidate the outlying subscribers in the Kanto Plains Communications Area to a standard DCA central location.

The Station Technical Control Facility at Fuchu AS, Japan, has been selected as the site for this central location. The GEEIA effort is directed towards integrating circuit conditioning equipment into the existing systems. A secondary effort will relocate and install some of this equipment to satisfy the needs of accessibility for operation and maintenance. Scheme 0546A9K0 which is concerned with this primary effort is presently 50% complete in engineering.

INTEGRATED JOINT COMMUNICATIONS SYSTEM - PACIFIC (IJCS-PAC)

IJCS-Pac provides multiple long line DCS circuits between Japan and the Philippines via Okinawa and Taiwan. The system is divided into three sections for management and installation. The Okinawa-Japan Tropo Sub-System and the Submarine Cable Sub-System are the responsibility of

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the USAF with GEEIA as the single manager. The Army Microwave System on Taiwan and Okinawa are being expanded by the USA.

a. Okinawa-Japan Tropo Sub-System - CEIP 3KB022Y1, 8D25P. This sub-system provides a 12-channel expansion and upgrades the system to DCA quality. The system involves 12 sites between Fuchu, Japan, and Yaetake, Okinawa. A contract was awarded to Nippon Electric Company for 4.7 million dollars to engineer, furnish, and install the new equipment for this project with an initial operational capability (IOC) of April 1970. The Nippon Electric Company engineering plan has been approved and construction is in progress at Chiran, Japan. Construction at two other sites, Fuchu and Yaetake, is scheduled to begin in July 1969. Installation is scheduled to begin in October 1969.

b. Submarine Cable Sub-System - CEIP 3KB022Y, 8E14P. This sub-system will provide a 60-channel submarine cable from Okinawa to Taiwan and from Taiwan to the Philippines. Link 1, Hambly Field, Okinawa to Camp McCauley, Taiwan, has been approved and the request for proposal has been issued to industry with an anticipated contract award of August 1969. Link 2, Taiwan to San Miguel, Philippines, is experiencing a delay at the present time. The State Department is negotiating with the Philippine Government for cable landing rights. This link has been placed in

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HIA status pending the outcome of the negotiations.

PROJECT STRAW HAT

During FY 69, Project Straw Hat progressed through the engineering and materiel phases and into the installation phase. Six major schemes[27] were written using 17 new major items and utilizing the associated Headquarters GEEIA Standard Drawings and Standard Facility Equipment List (SFEL) packages. Thirteen hundred hours of direct engineering were expended, and 800 hours of drafting support were required. Two of these schemes, 9026A8K0-DVLK and 9030A8K0-VQKB, were installed with on-site engineering assistance.

Major problems encountered have been the lack of properly cleared personnel, the inability of GEEIA Squadrons to correlate NSA-furnished material shipments to the GEEIA Bill of Materials, and lengthy shipping time required from NSA to site. On-site engineering assistance has also been required on the first installations.

Schemes 1161A9K through 1164A9K were recently assigned by Headquarters GEEIA direction as follow-on action to install Voice Coordination Sets which are not expected to be available until FY 370.

No major problems have been encountered with these newly assigned schemes.

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CHAPTER III

FOOTNOTES

1. Outside Plant - Schemes 0439A8K0, 2439A8K0, 2851A7K0
   Inside Plant - Scheme 0987A7K0
2. Scheme 1874A7K0
3. Scheme 0797A6K0
4. Scheme 1104A5K0
5. Scheme 0111A6K0
6. Schemes 0856A8K0 - 0874A8K0, 0928A9K0
7. Schemes 0861R9K0 - 0863A9K0; 0865R9K0 - 0823A9K0
8. Schemes 2637A7K0 - 2658A7K0
9. Schemes 0633A9K0, 0634A9K0, 0686A9K0, 0754A9K0
10. Schemes 270A8K0 - 271A8K0, 273A8K0, 275A8K0 - 276A8K0, 303A8K0, 715A7K0, 719A7K0 - 722A7K0, 724A7K0, 727A7K0 - 728A7K0, 730A7K0, 733A7K0 - 735A7K0, 737A7K0, 739A7K0 - 740A7K0, 745A7K0, 748A7K0, 750A7K0 - 751A7K0, 753A7K0, 759A7K0, 764A7K0, 766A7K0, 769A7K0 - 770A7K0, 774A7K0, 778A7K0 - 779A7K0, 781A7K0, 784A7K0, 787A7K0, 789A7K0, 1023A6K0, 2590A7K0 - 2594A7K0, 2702A7K0 - 2703A7K0, 2705A7K0 - 2706A7K0
11. Schemes 2303A7K0 - 2311A7K0, 2316A7K0, 2394A7K0, 0919A9K0
12. Scheme 2343A7K0
13. Scheme 0495A8K0
14. Schemes 2344A7K0, 0318A9K0
15. S hemes 0283A8K0 - 0301A8K0
16. Scheme 0374A8K0
17. Scheme 0377A8K0

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18. Scheme 0376A8K0

19. Scheme 0375A8K0

20. Scheme 0378A8K0

21. Scheme 0379A8K0

22. Schemes 0650A8K0 - 0655A8K0, 789A8K0

23. Scheme 0543A9K0

24. Taegu - Schemes 8350X9K0 (GCA), 8351X9K0 (TACAN), 8356X9K0 (Radio)
Kwang Ju - Schemes 8352X9K0 (GCA), 8353X9K0 (TACAN), 8358X9K0 (Radio)
Suwon - Schemes 8354X9K0 (GCA), 8355X9K0 (TACAN), 8357X9K0 (Radio)

25. Schemes 0095A6K0 - 0099A6K0, 0101A6K0 - 0104A6K0, 0106A6K0 - 0109A6K0, 0734A8K0 - 0737A8K0

26. Schemes 0246A8K0 - 0249A8K0, 0259A8K0 - 0268A8K0, 0978A8K0, 1035A9K0

27. Schemes 9025A8K0 - 9030A8K0

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CHAPTER IV

INSPECTIONS

ANNUAL GEEIA INSPECTION

The Annual General Inspection of Pacific GEEIA Region was conducted during the period 14 January - 15 February 1969. Units inspected were the 2876th GEEIA Squadron, Clark AB, P.I.; Detachment 2, 2875th GEEIA Squadron, Kadena AB, Okinawa; 2875th GEEIA Squadron, Tachikawa AB, Japan; Detachment 4, Pacific GEEIA Region, Hickam AFB, Hawaii; Headquarters Pacific GEEIA Region, Wheeler AFB, Hawaii. The inspection was conducted under the provisions of AFR 123-1 by the Office of the Inspector General, Headquarters GEEIA, Griffiss AFB, New York.

Pacific GEEIA Region Headquarters was rated satisfactory overall. Four areas were outstanding, ten areas were satisfactory, and one area (a repeat finding) was unsatisfactory since the assignment of proper message precedence had decreased. Outstanding customer satisfaction was expressed by commanders or other key personnel from Headquarters PACAF, Pacific Communications Area (AFCS), and Pacific Security Region (USAFSS). Job accomplishment was also outstanding as was the quality of completed work. Housekeeping was satisfactory and the

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barracks were outstanding. Morale was satisfactory. Although an active reenlistment program was in effect, the first term airmen reenlistment rate for July 1968 through January 1969 was only 9%.

USAF INSPECTION

No USAF inspection was held during FY 69.

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APPENDIX I

FY 1969 FINANCIAL SUMMARY

Major Force Program 7 - Central Supply and Maintenance
Cost Center F 31010 - Hq Pacific GEEIA Region
Total FY 1969 obligations: $3,417,842

1. EEC 30X, CIVILIAN PAY - $2,874,870.

This is the largest area of expense in the Region, amounting to 84% of the total headquarters obligations. Headquarters assigned civilians worked a total of 482,560 compensable regular manhours in FY 1969 at an average cost of $5.92 per hour. This equates to a total of 232 man years, for an average man year cost of $12,323. These figures include all civilian pay costs with the exception of overtime.

Compensable overtime amounted to a total of 2,401 manhours at an average cost of $6.64 per hour.

Total authorized civilian strength ranged from a high of 267 during the period July through December 1968 to a low of 256 in June 1969. This drop of 11 authorized spaces during FY 1969 was a direct result of the DOD directed reductions in civilian personnel authorizations.

Total assigned civilian strength remained relatively constant during the year, beginning with 239 on 1 July 1968 and ending with 238 on 30 June 1969. Fluctuations during the year resulted in an assigned high of 244 and an assigned low of 233.

The authorized and assigned grade spread as of 30 June 1969 was as follows:

Grade	Authorized	Assigned
GS-15	1	1
GS-14	4	3
GS-13	11	11
GS-12	31	31
GS-11	101	89
GS-9	23	23
GS-7	11	9
GS-6	7	6
GS-5	20	25
GS-4	27	24
GS-3	20	16
Total	256	238

Following is the cost breakout of our FY 1969 civilian pay expenses by detailed element of expense code:

EEC	Description	FY 1969 Expense
301	G.S. Base Pay	$2,322,551
302	G.S. Lump Sum Leave Payments	7,090
303	G.S. Overtime	15,948
306	Cost of Living Allowance	349,511
370	G.S. Personnel Benefits	
	Government Contributions	175,626
	Cash Awards	1,950
378	Moving Allowance	2,194
Total		$2,874,870

2. EEC 40X. TDY - $351,457.

Of the total FY 1969 TDY expense, $114,905 was for ASIF transportation (MAC aircraft fares), $49,559 was for commercial transportation, and $186,992 was for per diem.

TDY expenses can be further broken out into the following categories:

EEC	Description	FY 1969 Expense
40X80/40X94	Engineering	$248,203
40X81/40X93	Installation	48,313
40X82/40X97	Maintenance	2,036
40X86/40X96	Administrative	32,971
40X87/40X88	Training, Schooling	6,540
40X89	Vicinity Travel	8,513
40X92	Other	3,632
40X95	Air National Guard	1,189
Total		$351,456

Of the total FY 1969 TDY expenses, $214,586 or 61% was classified as being in direct support of SEA.

3. EEC 42X. PCS of Civilian Employees and Dependents - $15,888.

These obligations were incurred for PCS travel costs of mainland hires and terminations and the travel costs of civilian reemployment leave. During FY 1969, one mainland hire, six mainland terminations, and 16 reemployment leaves were funded by region headquarters.

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4. FEC 48X, Transportation of Household Goods - $12,878.

These funds were used to transport the household goods of mainland civilians hired or terminated.

5. FEC 49X, Communications - $8,286.

Of the total obligations, $8,274 was for TELEX charges and $12 was for official toll charges. This is an excellent record in the toll call area, which showed a reduction from $114 in FY 1968.

In the TELEX area, 1,390 messages were sent out and 1,586 messages were received in FY 1969. The average cost per message sent, including TELEX rental, line charges, and TELEX tolls amounted to $5.95. Current TELEX rates are as follows:

Monthly rental	$10.00
Monthly line charges	$39.35
Rates:	
New York	$ 2.00 per minute
Japan	$ 3.00 per minute - 3 minute minimum
Philippines	$ 3.00 per minute

6. FEC 55X, Professional Education and Contract Training - $2,890.

These funds were used to pay for 50 classes for Pac GEEIA personnel as follows:

Institution	Nr. of Personnel	Cost
Evelyn Wood Reading Dynamics	3	$ 450
University of Hawaii	26	1,[illegible]
Hawaii Employers Council Management Conference	7	380
University of California, Los Angeles	1	450
Hawaii Employers Council Motivation and Discipline Seminar	13	[illegible]
Total	50	$2,890

7. FEC 592, Miscellaneous Contractual Services - $[illegible].

In January, 1969, Hq GEEIA assumed funding responsibility for the Pacific GEEIA Region Indefinite Quantity (IQ) Contract with Kentron Corp., with the exception of contractor travel costs. Total FY 1969 Kentron IQ

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contract costs amounted to $595, 227, all of which were for engineering and drafting services. These obligations are recorded on the accounting records of Hq GEEIA, and are reported here for information only.

Total miscellaneous contractual services expenses recorded on the accounting records of Pacific GEEIA Region were in support of the following:

Kentron IQ Contractor Travel	$25, 743
Non IQ Contracts (Trenching, Backfill, Crane Rental)	16, 855
Modifications to FY 1968 Bendix IQ Contracts	25, 031
Total	$67, 629

8. <u>EEC 598, Military Cash Awards - $350.</u>

These funds were utilized to reward military personnel for their submission of a suggestion which was approved for adoption in accordance with AFM 900-4. Two cash awards were made to headquarters Pacific GEEIA personnel in FY 1969. This was considerably below expectations, which were based on an estimated 30% participation rate and a 20% adoption rate, for a total of 13 estimated cash awards.

9. <u>EEC 600 - 619, Supplies - $81, 586.</u>

Supplies were purchased from the following areas in FY 1969:

EEC 605, Purchases from the Systems Support Division (SSD) of the AF Stock Fund - $545.

EEC 609, Purchases from the General Support Division (GSD) of the AF Stock Fund - $48, 815.

EEC 619, Other purchases (Local purchase through base procurement) - $39, 226.

These funds were used for the following:

materials for reproduction of drawings of on-site installations and detailed schematics (Sepia paper and blue line paper), office and janitorial supplies, various fabrication requirements, epoxy resin, ammonia, various trophies and awards, and miscellaneous supplies.

10. <u>SEC 639. Equipment - $2,030.</u>

During FY 1969, as in the past, all of the Pacific GEEIA Region Headquarters equipment requirements were required to be furnished by the host, 6486th Air Base Wing. In actual practice, however, equipment funds are required by this headquarters for emergency mission support to our squadrons and detachments and for urgently needed items that cannot be procured by the host base in time to meet the requirement. These items were as follows:

Scotchlok Crimping Tool	$49
Splice Crimping Tool	17
Portable Hand Lamp	32
High Speed, Steel Cutting Drill Bit	[illegible]
Photographic Carrying Case (2)	34
Pipe and Cable Locator and carrying case	250
Kellem Grip, Support and Riser and Woodhead Tester	13
Steam cleaner with attachments	773
11,000 BTU Air Conditioner	199
Burster (for processing EDP products)	532
Total	$2030

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Major Force Program 7 - Central Supply and Maintenance
Cost Center F 33921 - Det 4, Pacific GEEIA Region
Total FY 1969 obligations: $140,055

1. EEC 30X, Civilian Pay - $108,014.

This is the largest area of expense in Det 4, amounting to 77% of Det 4's total obligations. Det 4's assigned civilians worked a total of 23,065 compensable regular manhours in FY 1969 at an average cost of $4.64 per hour. This equates to a total of 11 man years, for an average man year cost of $9,733. These figures do not include overtime.

Compensable overtime amounted to a total of 137 manhours at an average cost of $6.94 per hour.

Total authorized civilian strength ranged from a high of 19 during the period July 1968 through March 1969 to a low of 10 in April, May and June. This drop of 9 authorized spaces during FY 1969 is directly attributable to the DOD directed reductions in civilian personnel authorizations.

Total assigned civilian strength remained relatively constant during the year, beginning with 13 in July 1968 and ending with 10 in June 1969.

The authorized and assigned grade spread as of 30 June 1969 was as follows:

Grade	Authorized	Assigned
GS-9	1	1
GS-7	1	1
GS-4	2	2
WB-12	1	1
WB-11	5	5
Total	10	10

Following is the cost breakout of Det 4's FY 1969 civilian pay expenses by detailed element of expense code:

EEC	Description	FY 1969 Expense
301	G.S. Base Pay	$ 28,459
306	Cost-of-living Allowance	4,238
321	W.B. Base Pay	66,294
323	W.B. Overtime Payments	951
370	G.S. Personnel Benefits	2,174

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372	W.B. Personnel Benefits	5,338
378	Moving Allowances	500
Total		$108,014

2. EEC 40X, TDY - $12,556.

Of the total FY 1969 expense, $1,449 was for ASIF transportation (MAC Airlift Charges), $1,295 was for commercial transportation, and $9,812 was for per diem.

These expenses can be further broken out into the following categories:

EEC	Description	FY 1969 Expense
40X80/40X81	Installation	$ 4,686
40X82	Maintenance	5,623
40X86	Administrative	139
40X87/40X88	Training, Schooling	927
40X89	Vicinity Travel	495
40X92	Other	453
40X95	Air National Guard	233
Total		$12,556

3. EEC 42X, PCS of Civilian Employees and Dependents - $531.

These obligations were incurred for the travel costs of civilian reemployment leave for one man from Det 4 in FY 1969.

4. EEC 600-619, Supplies - $18,955.

In direct support of Det 4's installation and maintenance workload during FY 1969, supplies were purchased from the following areas:

EEC 605, Purchases from the Systems Support Division (SSD) of the AF Stock Fund	$3,966
EEC 609, Purchases from the General Support Division (GSD) of the AF Stock Fund	$13,624
EEC 619, Other Purchases (Local Purchase through base procurement)	$1,364

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These funds were used for the following:

Rope, cable, chain and fittings; hardware and abrasives; electrical wire; electrical components; non-metallic fabricated materials; lumber; office supplies and toiletries.

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Major Force Program 7 - Central Supply and Maintenance
Cost Center F 33930 - 2875th GEEIA Squadron
Total FY 1969 obligations: $1,943,776

1. EEC 30X, Civilian Pay - $239,801.

These obligations are for the DAF civilians assigned to the 2875th GEEIA Sq. They can be specifically identified as follows:

EEC	Description	FY 1969 Expense
301/311	G.S. Base Pay	$182,446
302	G.S. Lumb Sum Leave Payments	672
303	G.S. Overtime	2,699
304	G.S. Holiday Pay	72
305	G.S. Nightwork Differential	24
321	W.B. Base Pay	8,659
323	W.B. Overtime	5,650
341	F.N. Direct Hire	672
370	G.S. Personnel Benefits	37,455
372	W.B. Personnel Benefits	557
Total		$239,801

Total authorized DAF civilian strength ranged from a high of 23 during the period July 1968 through March 1969 to a low of 20 from April through June 1969.

Assigned DAF civilian strength remained relatively constant during the year, beginning with 20 on 1 July 1968 and ending with 18 on 30 June 1969.

The authorized and assigned grade spread as of 30 June 1969 was as follows:

Grade	Authorized	Assigned
GS-11	11	9
GS-10	1	1
GS-9	4	4
GS-5	2	2
WB	1	1
FN	1	1
Total	20	18

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2. EEC 40X, TDY - $471,475.

Of the total FY 1969 TDY expense, $66,564 was for ASIF transportation, $31,407 was for commercial transportation, and $373,504 was for per diem.

TDY expenses can be further broken out into the following categories:

EEC	Description	FY 1969 Expense
40X94	Operational Engineering	$ 824
40X81/40X93	Installation	305,639
40X82/40X97	Maintenance	148,919
40X86/40X96	Administrative	1,816
40X87/40X88	Training, Schooling	10,752
40X92	Other	3,475
Total		$471,475

Of the total FY 1969 TDY expenses, $401,072 or 85% was classified as being in direct support of SEA.

3. EEC 426, PCS of Civilian Employees and Dependents - $2,529.

This requirement was for the travel costs of U.S. Civilian hires, terminations, and reemployment leaves between the U.S. and Japan. During FY 1969, three terminations and one reemployment leave were financed from the 2875th.

4. EEC 46X, Transportation of Household Goods - $4,513.

These funds were required for transporting the household goods of U.S. civilians hired or terminated.

5. EEC 49X, Communications (TELEX) - $2,090.

These obligations were incurred for TELEX charges in FY 1969. The 2875th TELEX facility was installed in November, 1968, and this cost is for a seven month period of TELEX operation.

6. EEC 511, Foreign National Pay - $537,669.

These funds were expended for the master labor contract with the Japanese Government. As of 30 June 1969, 169 personnel were authorized and 168 were assigned under this contract.

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7. EEC 529, Minor Construction Projects - $13,000.

These funds were used for Project TAC-152-9, alteration of Primary Distribution Lines, consisting of extending a primary 60 cycle distribution line to the South GCA Site.

8. EEC 549, Purchased Maintenance from Other DOD Sources - $1,665.

These obligations were to support the ISSA between the 2875th and the U.S. Army Depot Command, Japan, for maintenance and repair of electronic and communications equipment.

9. EEC 569, Purchased Maintenance of Equipment - $3,441.

These funds were required to refund the 6100th Support Wing (PACAF) at Tachikawa for repair support provided by them for MAP C-E vans and GCA vans IAW the current Host-Tenant Support Agreement.

10. EEC 592, Storage of Household Goods - $126.

This requirement was to provide non-temporary storage of household goods for three PCS U.S. civilians assigned to the 2875th. As of 30 June 1969, one man was storing his household goods at government expense.

11. EEC 598, Military Cash Awards - $910.

These funds were used to reward military personnel for their approved suggestions under the provisions of AFM 900-4. A total of 25 suggestions were submitted by 2875th military personnel in FY 1969, for a 6% military participation rate in the suggestion program.

12. EEC 600-619, Supplies - $660,264.

Supplies in support of the 2875th's installation and maintenance workload were purchased from the following areas in FY 1969:

EEC	Description	FY 1969 Expense
604	Medical Supplies	$ 14
605	Purchases from the System Support Division of the AF Stock Fund	124,835
609	Purchases from the General Support Division of the AF Stock Fund	524,287

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612	Ground POL	2,519
619	Other Purchases	8,612

13. EEC ..0 - 644. Equipment - $1,055.

Although the host 6100 Support Group is responsible for furnishing equipment required by the 2875th, a minor amount of equipment funds are necessary for repair items drawn by the 2875th from the host and issued to our units in the field as a repair item but not listed on the hosts EMO records and not returned to the host.

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Major Force Program 10 - Support of Other Nations
Cost Center F 33935 - Military Assistance Program (MAP)
Total FY 1969 obligations: $25,343

1. EEC 40X, TDY -$22,343.

These funds were used to support installation and maintenance teams from the 2875th to SEA in support of MAP projects.

2. EEC 600-619, Supplies - $3,000.

These funds were used to refund MFP 7, 2875th GEEIA Sq for installation and maintenance supply support for MAP projects.

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TOTAL REGION FINANCIAL SUMMARY

FY 1969 OBLIGATIONS

1. By Cost Center:

F 31010	Hq Pac GEEIA	$3,417,842
F 33921	Det 4	140,055
F 33930	2875th GEEIA Sq	1,943,776
F 33935	MAP	25,343
Total		$5,527,016

2. By Element of Expense Code:

391	CIV Overtime	$ 25,448
392	CIV Pay	3,197,237
40X	TDY	857,831
42X	PCS - Civilians	16,925
46X	Transp of HHG	17,392
49X	Comm (TELEX)	10,376
51X	F.N. Pay	537,666
529	Minor Construction Projects	18,000
549	P.M. from DOD	1,885
553	Professional Education	2,850
569	P.M. of Equip	3,441
592	Misc Contract Services	67,754
593	Military Cash Awards	1,260
600 - 619	Supplies	763,805
620 - 644	Equipment	3,084
Total		$5,527,016

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APPENDIX 2

ROCK TOP

PAL GONG SAN

Radar

1 ea AN/FPS-100A Search Radar

2 ea AN/FPS-89 Height Finder Radars

3 ea CW/396A Radome

Operation Building

Indicators

Video Mappers

IFF-SIF Components

AN/FGC-20, AN/FGC-25

GRR Building

AN/GRR-7, AN/GRT-3, AN/GRC-27, AN/GRC-41, RC-256, RC-257

Operations Building Comm Facilities

AN/FTA-13

Schemes

0744A5-RB31-X-1102	0717A5-RB31-C-6000
0704A5-RB31-A-0011	0735A5-RB31-R-1103
0712A5-RB31-B-0011	0736A5-RB31-R-6000

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ROCK TOP

UISONG BONG

Radar

1 ea AN/FPS-100A Search Radar

2 ea AN/FPS-89 Height Finder Radars

3 ea CW/396A Radomes

Operations Building

Indicators

Video Mapper

IFF-SIF Components

AN/FGC-20, AN/FGC-25

GRT Building

AN/GRR-7, AN/GRT-3, AN/GRC-27, AN/GRC-41, RC-256

RC-257

Operation Building Comm Facilities

AN/FTA-13

Schemes

0742A5-WK70-X-1102	0715A5-WK70-C-6000
0702A5-WK70-A-0011	0731A5-WK70-R-1105
0710A5-WK70-B-0011	0732A5-WK70-R-6000

TOP LEVEL

MANGIL SAN

Radar

1 ea AN/FPS-100A Search Radar

2 ea AN/FPS-89 Height Finder Radar

3 ea CW/396A Radomes

Operation Building

Indicators

Video Mappers

IFF-SIF Components

AN/FGC-20, AN/FGC-25

GRT Building

AN/GRR-7, AN/GRT-3, AN/GRC-27, AN/GRC-41, RC-256, RC-257

Operation Building Comm Facilities

AN/FTA-13

Schemes

0740A5-MV79-X-1102	0714A5-MV79-C-6000
0700A5-MV79-A-0011	0727A5-MV79-R-1105
0708A5-MV79-B-0011	0728A5-MV79-R-6000

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TOP LEVEL

YONG MUN SAN

Radar

1 ea AN/FPS-100A Search Radar

2 ea AN/FPS-89 Height Finder Radars

3 ea CW/396A Radomes

Operation Building

Indicators

Video Mapper

IFF-SIR Components

AN/FGC-20, AN/FGC-25

GRT Building

AN/GRR-7, AN/GRT-3, AN/GRC-27, AN/GRC-41, RC-256

RC-257

Operation Building Comm Facilities

AN/FTA-13

Schemes

0743A5-YG35-X-1102	0716A5-YG35-C-6000
0703A5-YG35-A-0011	0733A5-YG35-R-1105
0711A5-YG35-B-0011	0734A5-YG35-R-6000

TOP LEVEL

IRWOL SAN

Radar

1 ea AN/FPS-100A Search Radar

1 ea AN/FPS-89 Height Finder Radar

3 ea CW/396A Radomes

Operation Building

Indicators

Video Mapper

IFF-SIF Components

AN/FGC-20, AN/FGC-25

GRT Building

AN/GRR-7, AN/GRT-3, AN/GRC-27, AN/GRC-41, RC-256

RC-257

Operations Building Comm Facilities

AN/FTA-13

Schemes

0738A5-KF09-X-1102	0713A5-KF09-C-6000
0699A5-KF09-A-0011	0723A5-KF09-R-1105
0706A5-KF09-B-0011	0724A5-KF09-R-6000

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PERIMETER SITES

CHEJU DO

Radar

1 ea AN/GPS-4 (Dualized) Search Radar

1 ea AN/FPS-89 Height Finder Radar

2 ea CW/396A Radomes

Operations Building

Indicators

Video Mapper

IFF-SIF Components

AN/FGC-20, AN/FGC-25

GRT Building

AN/GRR-7, AN/GRT-3, AN/GRC-27, AN/GRC-41, RC-256, RC-257

Operation Building Comm Facilities

AN/FTA-13

Schemes

0737A5-DV37-X-1102	0722A5-DV37-R-6000
1035A5-DV37-A-0011	0115T6-DV37-X-1102
1037A5-DV37-B-0011	0116A6-DV37
1040A5-DV37-C-6000	0117A6-DV37
0721A5-DV37-R-1105	

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PERIMETER SITES

KANGNUNG

Radar

1 ea AN/GPS-4 (Dualized) Search Radar

1 ea AN/FPS-89 Height Finder Radar

2 ea CW/396A Radomes

Operation Building

Indicators

Video Mapper

IFF-SIF Components

AN/FGC-20, AN/FGC-25

GRT Building

AN/GRR-7, AN/GRT-3, AN/GRC-27, AN/GRC-41, RC-256,

RC-257

Operation Building Comm Facilities

AN/FTA-13

Schemes

0739A5-KR32-X-1102

1038A5-KR32-B-0011

1041A5-KR32-C-6000

0725A5-KR32-R-1105

0726A5-KR32-R-6000

PERIMETER SITES

P-Y-DO

Radar

1 ea AN/FPS-100 Search Radar

1 ea AN/FPS-89 Height Finder Radar

2 ea CW/396A Radomes

Operation Building

Indicators

Video Mapper

IFF-SIF Components

AN/FGC-20, AN/FGC-25

GRT Building

AN/GRR-7, AN/GRT-3, AN/GRC-27, AN/GRC-41, RC-256, RC-257

Operation Building Comm Facilities

AN/FTA-13

Schemes

0741A5-RA07-X-1102	1042A5-RA07-C-6000
1034A5-RA07-A-0011	0729A5-RA07-R-1105
1039A5-RA07-B-0011	0730At-RA07-R-6000

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UNIT HISTORY
DETACHMENT 4, PACIFIC GEEIA REGION
FY 1969

DETACHMENT 4, PACIFIC GROUND ELECTRONICS
ENGINEERING-INSTALLATION AGENCY REGION
UNIT HISTORY

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MISSION

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MISSION

Det 4 again this year remained the sole Air Force agency responsible for installation, rehabilitation, and depot level maintenance of all fixed ground communication-electronics equipment at Air Force facilities in the Hawaiian Islands, Wake Eniwetok, Kwajalein, Midway, Johnston Atoll and other areas as directed. This year we were tasked with one-time projects in Thailand, Guam, and Christmas Island.

The importance of our mission is readily identified when considering the facilities in our geographical area. Predominant among these, of course, is Headquarters, Pacific Air Forces, and its command communications systems. Some of our requirements this year in support of PACAF's mission included installation or maintenance tasks for the Global Communication System encompassing Bellows AFS transmitter site, Wheeler AFB receiver site, and Hickam AFB DCS station. Other facilities or organizations serviced by Det 4 during the last year included Joint Task Force 8 and the Atomic Energy Commission on Johnston Atoll, the Tri-Services Communication Network at Kunia Annex, Hawaiian Air Defense facilities, SAC X-RAY SSB station, facilities of Air Force security Service, and the AFSC Satellite Tracking Station at Kaena Point.

It should be noted that Det 4's installation/maintenance posture in the overall communication network is necessarily that of providing the vital link between Southeast Asia, PACAF, and CONUS assuring the marriage of distant ends of newly installed systems with terminal ends at PACAF and relay links to the CONUS.

O R G A N I Z A T I O N

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PERSONNEL

Detachment 4 is organized into two direct work centers, Electronics and Wire, and two indirect work centers, Workload Control and Supply Support, all under the direct supervision of the Commander. This simple structure is necessitated by our VDL which, during this year, has provided only the bare essentials. This resulted in the Commander wearing the additional hats of Operations Officer, Administrative Officer, and Supply Officer. Further break out of the multitudinous duties required of any organization, regardless of size, required assignment of additional duties to various sections regardless of their primary responsibility. Examples are: Chief of Electronics--NCOIC for Military matters, section quality control inspector, and Security NCO. Wire Chief--Training NCO, Safety NCO, section quality control inspector. Supply Chief--Corrosion Control Program. Workload Control--T. O. Library, UR Control Officer, Zero Defects/Cost Reduction Program, incentive awards program, civilian personnel representative. Commander's secretary--Publications Distribution Officer, Travel Coordinator, and general administrative duties and functions. Additionally other NCOs absorbed the responsibilities for conducting periodic campaigns such as the Air Force Aid Society, Bond drives, and United Fund drive.

In spite of the diversified duties levied on our limited personnel, morale has remained high.

The number of personnel authorized has decreased this year as a result of a DOD directed reduction in civilian personnel authorizations. Personnel strength is now 10 civilian and 25 military authorized. A break out of personnel assigned at the close of the period is attached.[1]

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FACILITIES

During the past year Detachment 4 was still located at Hickam AFB. There were no physical building or real estate changes. Our facilities still consist of 3 each buildings, with a total covered area of 32,640 square feet. All offices remained in Building 3025 which also includes the Detachment 4 tool crib and bench stock areas. Building 3047 remains our scheme warehouse and is located about 1/4 mile from building 3025. There are still 42,000 square feet of open storage and vehicle parking areas. All buildings are quite old but still in satisfactory condition.

This past year Detachment 4 acquired several new items of equipment including three jeeps which enhanced the mission potential. (See attachments for complete listing of vehicles and equipment).[5]

ACCOMPLISHMENTS

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REPORT OF ANNUAL GENERAL INSPECTION

DETACHMENT 4

PACIFIC GEEIA REGION

The overall rating of Detachment 4, Pacific GEEIA Region, was outstanding in that nine areas were outstanding, four areas were satisfactory and no areas were unsatisfactory. Job accomplishment and customer satisfaction were outstanding as was indicated by the Commander of the 1957th Comm Group. The Quality Control function was being performed in a satisfactory manner. Commendable was the DOI on quality control procedures. Sampling inspections were being accomplished on approximately 10% of installation workload. Operations were excellent. Particularly commendable were the maintenance, filing and retention of active and completed scheme/MIM job folders as well as the issue and control of team chief handbooks. Management areas were outstanding and included manhour accounting, Zero Defects, War and Emergency Planning, designation of emergency essential civilian positions and possession of properly completed Emergency Action Data Cards (AF Form 1173). No repeat findings were detected. The Support Branch operation was excellent. Commendable was the turn-in of 78 line items of excess property worth $52,137.00. The Ground Safety Program was outstanding and indicated that the Commander had provided exemplary emphasis and support. The detachment had not reported a military disabling injury since February 1967 and had not reported a government motor vehicle accident since August 1966. Since the last government motor vehicle accident was reported, approximately 200,000 miles had been

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driven. Administration was outstanding. Only 4% of the messages transmitted electrically had an incorrect precedence assigned. Security was excellent. Security termination statement files, access authorization certificates and cryptographic access records were outstanding. Morale was outstanding. No first-term airmen were eligible for reenlistment. Housekeeping was outstanding in both housing and work areas. Training was satisfactory. The SKT passing rate was 33% and all GMT was completed for CY 68. There were no findings to include in the body of the report.

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OPERATIONS

Eighty-one individual jobs were completed by Detachment 4 this year. This included both schemes and maintenance actions and does not account for Pre-Installation Surveys (PIS) and Pre-IRAN Surveys. The number of jobs completed represents 75% of last year's number, but we are proud of this record in view of the following: Only one of the jobs listed was accomplished contractually as opposed to thirteen last year; less augmentee manhours were borrowed from other GEEIA organizations; finally, nine highly skilled direct laborers were lost through re-assignment, transfer or separation from service. It is true that we gained five new direct workers, however, their gain had little impact in aiding us with the FY 69 workload for several reasons. First, four men were assigned in the last two months of the fiscal year. One man, although not yet officially transferred, was reassigned to the RFI branch of Engineering. Two of the men are Outside Plant construction personnel and our workload has decreased considerably for this skill. In fact, at the close of the fiscal year they were committed for augmentation to SEA. We are still in need of skilled Crypto/Teletype personnel since these commodities make up more than half of our projected workload.

Safety

TSgt Mowell remained in charge of Safety this year. On 25 Sep 68, Detachment 4 formed it's own Safety Council and had it's first meeting. The Council meets the second Wednesday of each month. Since the formation of the Council, many problems have been brought up and solved. The following are examples of some of the problems that were overcome. Seatbelts in our vehicles were being damaged and subjected to the elements. Knowing that a person is not likely to put on a dirty seatbelt, the Council discussed and decided to install belt retractors in all vehicles. Some of our trucks turned into Motor Pool for maintenance were observed being driven on base by other than Detachment 4 personnel. The Council took immediate action which resulted in no further such incidents. It was proposed that a more "in depth" briefing be given to motorcyclists. A new briefing was drawn up and approved by the Council.

A program was set up to insure everyone arriving TDY or PCS would receive a Safety briefing. This briefing includes highway, beach, pedestrian, poison plants, animal and reptiles. There is also a briefing to cover two wheel vehicles. Seven Safe Driver awards were presented to Detachment 4 personnel. Private Motor Vehicle Safety awards were also presented. Captain Dougharty received an award for Five Years of Safe Driving and Wearing of the Seatbelt. SSgt Lemly received a three year award and SSgt Gomez a two year award. A safety reminder brief is given at each Commander's Call. These are in addition to the quarterly briefings. A field visit to the job site is taken each month by the Safety NCO. SSgt Lemly took over the Safety Program 10 Jun 69. TSgt Mowell received a desk set for his hard work as Ground Safety NCO and the outstanding program he put into operation. No reportable accidents occured this year. Our Safety Program remained very effective and was deemed outstanding by the 1969 IG of Hq GEEIA.

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COMMAND SECTION

Captain Marvin E. Dougharty, Jr., remains the Commander of Detachment 4, Pacific GEEIA Region. The Commander is the only commissioned officer assigned to Detachment 4 and in effect wears several hats, i.e., Operations Officer, Supply Officer, Safety Officer, Security Officer, and Administrative Officer, etc.

The entire administrative portion of the detachment has been handled by the Commander's Secretaries. The Commander's secretary, Miss Abrams, transferred to another organization at the end of the first quarter. She was replaced by Mrs. Lowrey who accepted another position at the end of the second quarter. Mrs. Dottie Harrington was hired at the beginning of the third quarter as Secretary and Chief of the Administrative function. She was joined by A1C Belbeck, AFSC 70450, during the fourth quarter. We now hope to have more stability in this very important section.

Even though there were several personnel changes, the CY 69 IG Report stated, "Administration was outstanding." This is the second outstanding IG Report in a row for this section.

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WORKLOAD CONTROL SECTION

Workload Control, still guided by Mr. Hervey A. Thomas, was besieged by change in personnel throughout the year. Mr. Cowper, GS-7 Scheduler, transferred to Hq Pacific GEEIA Region leaving his position vacant for about a month. Mrs. Hazel Kondy from Production Control of the Engineering Directorate was promoted into this slot. Shortly after her assumption of scheduling duties, Mr. Thomas was absent for one month on re-employment leave. After being back on the job for about one month, he was injured in an automobile accident and was absent for six weeks. Shortly after his return to duty we were notified that Mr. Kenneth L. Watts would be returning to Hawaii from Taiwan to claim his former position as Scheduler. Since this was an obligated position, Mrs. Kondy was transferred to the 6486th AB Wing by RIF action and Mr. Watts was assigned in mid-June.

In spite of the upheaval in personnel, this section has managed to stay on top of the program, keeping abreast of upcoming workload and advising the work centers in a timely manner. Command Control reporting has become more accurate and coordination with the work centers has improved.

Miss Lau, Production Control Clerk, has worked hard in screening T. O. requirements. We have eliminated the second copy file of T.O.s since her usage records showed they were not warranted.

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ELECTRONICS SECTION

TSgt Roger S. Kinney remained as the section supervisor, managing both radio and radar technicians.[1] During this year there were no losses in military personnel, however, two highly qualified civilian radio repairmen left this section. Their loss was felt immediately but a concentrated effort by all remaining personnel enabled the efficiency of this section to exceed that of the previous year.

During this period both radio and radar personnel were assigned GFIR duties at Johnston Atoll and Hickam. Schemes involved Blue Bar/ Green Bar and Scope Scoop equipment installations at both locations. These included 2084 amplifiers for SAC XRAY, air to ground radio at Wake, Midway, Johnston Atoll and Hickam AFB. Periodically they were called upon for emergency maintenance on radar systems for the Hawaiian Air National Guard at Mt. Kaala, Hawaii.

Throughout this year the radio repairmen were called upon for installation of radio systems at Hickam, Johnston Atoll, Kunia Tunnel, Mt. Mauna Kapu and Wake Island. Several installations of new equipment types, i.e. Tele-Signal, produced numerous problems, however, all were solved and schemes completed. Along with installations, several IRAN's were accomplished on equipment varying from out-moded GRC-26 to single channel air to ground and multi-channel radio systems.

Although the work force was smaller than the previous year, there was only one requirement for augmentation to meet the electronic work load.

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One radio installer was assigned to the Pac GEEIA Rgn Command Control Room and four radio installers/repairmen attended formal training courses during this year. Overall this section accomplised 23 jobs at many locations.[3]

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WIRE SECTION

TSgt Raymond E. Mowell still remained Chief of the Wire Section and once again his section provided us with a fruitful year as far as scheme completions, personal achievements and overall section dependability is concerned. The amount of work accomplished is out of proportion with the personnel assigned to the section. Many times we were forced to sacrifice and work during off-duty time to compensate for the lack of assigned skills for a particular task; realizing, of course, the importance in completing work on schedule. The names of most individuals in the wire work center are synonymous with dependable and quality workmanship.[1] This fact is substantially supported by letters of appreciation received from our most satisfied customers. One of the more significant jobs we were tasked to install was the Autovon Network for this area. This system provides for long line voice communication extending from one end of the globe to the other and included many up to date high speed varients such as push button dialing, interruption of low-precedence calls, switching of calls and world wide conference calls of up to 26 participants without operator assistance.

Three outstanding NCOs received the award of the Air Force Commendation Medal for meritorious service rendered.[2] In every case the aforementioned NCO contributed unselfishly to the sculpturing of an outstanding military unit. The devotion to their unit and the extra effort expended in keeping themselves technically qualified and up to date contributed considerably to the outstanding rating received in the past IG inspection. Overall, this section accomplished 58 jobs at many locations.[4]

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SUPPLY SECTION

SSgt Lemly is still in charge of Material Control. There have been no losses or gains in personnel in the past year. Sgt Mattingly is TDY to Det 2, 2875th GEEIA Sq in Okinawa. He is helping fill vacancies in Material Control caused by rotation.

There have been three promotions in Material Control. Airman Lepucki was promoted to the rank of Sgt, Sgt Cvar to SSgt, and SSgt Lemly was notified of promotion to TSgt during the May-Dec cycle. All excess cable has been turned into BASO and the cable yard has been moved into the enclosed area next to building 3025 for more security and better control. We have thirty vehicles assigned to us at this time.[5] Vehicle 62B2240 is still TDY to Johnston Atoll. We have received three M-151 jeeps and a tilt-bed trailer for our TF1000 Trencher. This trailer was field tested by Detachment 4 and the results forwarded to headquarters for evaluation. A modification kit was received for our TF1000 Trencher. This kit contains replacement track. When installed it will give the trencher much stronger tracks than it now carries. Our crewcab vehicles have traveled 61,335 miles in the last year. Our bench stock is 100% filled. Our EMO account is 97% filled and we have due-in for the missing items. The warehouse has received 114,111 lbs and 7,232 cubes this past year, and has shipped 49,974 lbs and 4,899 cubes. Sgt Lepucki has received a Bronze Zero Defects Award. SSgt Lemly has attended the Base Level Management II course and the Stock Funds Management course, receiving diplomas for both. SSgt Cvar also attended the Management II course.

ATTACHMENTS

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ASSIGNED PERSONNEL

COMMAND SECTION:

Captain Marvin E. Dougharty		Commander	3034
Mrs. Dottie Harrington	GS-4	Clerk-Stenographer	70454
Sgt Daniel L. Belbeck		NCOIC, Admin Sec	70250

WORKLOAD CONTROL:

Mr. Hervey A. Thomas	GS-9	Supv, Production Controller	69190
Mr. Kenneth L. Watts	GS-7	Production Controller	69170
Miss Elsie Lau	GS-4	Production Control Clerk	69130

SUPPLY SECTION:

SSgt Gary L. Lemly		NCOIC	64570
SSgt Durward M. McGhee		Warehouseman	64770
SSgt Fred Cvar		Scheme Monitor	64750
Sgt Terry D. Mattingly		Warehouseman	64750
Sgt Walter F. Lepucki		Warehouseman	64750

ELECTRONICS BRANCH:

TSgt Roger S. Kinney		NCOIC	30474
TSgt Nolan E. Howard		Radio Installer	30454
TSgt Robert G. Green		Radar Repairmen Supv	30372
SSgt Jesse D. McMurtry		Radar Repairman	30372
SSgt Gary L. Blomquist		Radio Installer	30454
A1C Lloyd C. Jones		Radio Installer	30454
Mr. Roy Tsuruda	W-12	Radar Repairer	30372
Mr. Roscoe Frink	W-11	Radar Repairer	30352
Mr. Samuel Chun	W-11	Radio Repairer	30454
Mr. Donald Inouye	W-11	Radio Repairer	30454

Mr. Peter Ng	W-11	Radio Repairer	30454

WIRE BRANCH:

TSgt Raymond E. Mowell		NCOIC	36271
SSgt W. J. Crain		Crypto Team Chief	30650
SSgt Anselmo Gomez		Telephone Team Chief	36251
SSgt Earl Flint		Splicing Team Chief	36154
Sgt Richard J. Yager		Construction Team Chief	36150
Sgt Milton Watkins		Teletype Team Chief	36350
Sgt Randall Kirkham		Crypto Installer	30650
Sgt Harold Thomas		Construction Installer	36150
A1C Albert C. Langlois		Teletype Installer	36330
A1C Michael J. Tew		Teletype Installer	36330
A1C Alfreddie Blue		Construction Installer	36150
A1C Robert G. Menzie		Teletype Installer	36350
Mr. Shoji Tamaoka	W-11	Telephone Central Office Repairer	36252

PERSONNEL
GAINS AND LOSSES

GAINS	LOSSES
TSgt Robert Green, 30372	Sgt Johnny Chestnut, 36350
SSgt Jesse McMurtry, 30372	Sgt Lloyd Parks, 36150
Sgt Daniel Belbeck, 70250	Sgt Dennis Gheen, 36154
Sgt Richard Yager, 36150	A1C Mark Ross, 36150
A1C Robert Menzie, 36350	Mr. William Wong, 30474
A1C Albert Langlois, 36330	Mr. Benjamin Quimino, 30454
A1C Michael Tew, 36330	Mrs. Joy Abrams, 70454

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A1C Alfreddie Blue, 36150	Mrs. Jean Lowrie, 70454
Mr. Shoji Tamaoka, 36252	Mr. James Cowper, 68370
Mr. Ken Watts, 69170	Sgt Alfred Sharpe, 36251
Mrs. Dottie Harrington, 70454	Miss Hazel Kondy, 68370

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AWARDS

AF COMMENDATION MEDAL:

SSgt Anselmo Gomez

Sgt Johnny Chestnut

Sgt Alfred Sharpe

ZERO DEFECTS AWARDS:

Mr. James Cowper	Silver
TSgt Roger Kinney	Bronze
TSgt Raymond Mowell	Bronze
SSgt Anselmo Gomez	Bronze
SSgt W. J. Crain	Bronze
SSgt Gary Bloomquist	Bronze
Sgt Alfred Sharpe	Bronze
Sgt Randall Kirkham	Bronze
Sgt Walter Lapucki	Bronze
Sgt Milton Watkins	Bronze
A1C Lloyd Jones	Bronze
Miss Joy Abrams	Bronze
Mr. James Cowper	Bronze
Mr. Roscoe Frink	Bronze

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ELECTRONICS SECTION

Location	Win	Commodity
Bellows AFS	0008L7KO	J
Bellows AFS	0027L7KO	R
Bellows AFS	0848A8KO	R
Bellows AFS	5096L9KO	R
Bellows AFS	5098L9KO	R
Bellows AFS	5099L9KO	R
Hickam AFB	0359A3KO	R
Hickam AFB	5111L9KO	R
Johnston Atoll	0155A8KO	R
Johnston Atoll	0602A4KO	N
Johnston Atoll	2527A7KO	N
Johnston Atoll	1009A5KO	R
Johnston Atoll	1382A6KO	R
Johnston Atoll	1383A6KO	R
Johnston Atoll	5068L8KO	R
Kokee, Kauai	5108L9KO	R
Kunia Annex	0429A5KO	R
Kunia Annex	0849A8KO	R
Kunia Annex	0907A6KO	R
Mt. Kaala	8001X9KO	X
Mt. Kaala	8009X9KO	X
Wake Island	2858A7KO	N
Wheeler AFB	0847A8KO	R

TOTAL NUMBER OF JOBS: 23

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WIRE SECTION TELETYPE/CRYPTO

Location	Win	Commodity
Clark AFB	1987A7KO	K
Hickam AFB	0055A9KO	C
Hickam AFB	0147A5KO	K
Hickam AFB	0391A9KO	K
Hickam AFB	0472A7KO	C
Hickam AFB	0513A7KO	K
Hickam AFB	0567A6KO	K
Hickam AFB	0673A8KO	K
Hickam AFB	0753T8KO	K
Hickam AFB	0791A6KO	K
Hickam AFB	0835A8KO	K
Hickam AFB	1780A7KO	K
Hickam AFB	1810R7KO	K
Hickam AFB	1867R7KO	K
Johnston Atoll	1004A5KO	C
Johnston Atoll	1005A5KO	C
Johnston Atoll	2257A7KO	K
Kaena Point	0773A8KO	K
Kunia Annex	0145A5KO	K
Kunia Annex	0332A1KO	K
Kunia Annex	0997A6KO	K
Kunia Annex	1255A4KO	K
Kunia Annex	1489A4KO	K
Kunia Annex	1528T4KO	K
Kunia Annex	1807A7KO	K
Kunia Annex	1811A7KO	K
Kunia Annex	1868A7KO	K
Kunia Annex	2640A7KO	K
Wheeler AFB	1118A5KO	C

TOTAL NUMBER OF JOBS: 29

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WIRE SECTION INSIDE PLANT

Location	Win	Commodity
Hickam AFB	0011A9KO	A
Hickam AFB	0342A6KO	A
Hickam AFB	0649A8KO	A
Hickam AFB	0872A7KO	A
Hickam AFB	0904A5KO	A
Hickam AFB	1820A7KO	A
Johnston Atoll	1166A7KO	A
Johnston Atoll	1167A7KO	A
Johnston Atoll	1819A7KO	A
Wheeler AFB	1087A9KO	A
Wheeler AFB	1088A9KO	A

TOTAL NUMBER OF JOBS: 11

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WIRE SECTION OUTSIDE PLANT

Location	Win	Commodity
Bellows AFS	0129A6KO	S
Christmas Is.	0439R9KO	S
Hickam AFB	0144A8KO	B
Hickam AFB	0145A8KO	B
Hickam AFB	0159A6KO	S
Hickam AFB	0203A6KO	B
Hickam AFB	0518A6KO	B
Hickam AFB	0794A8KO	B
Hickam AFB	1270A7KO	B
Hickam AFB	1843T7KO	S
Hickam AFB	8000X9KO	B
Hickam AFB	8002X9KO	B
Hickam AFB	8004X9KO	B
Hickam AFB	8005X9KO	B
Hickam AFB	8007X9KO	B
Kokee, Kauai	8008X9KO	S
Mauna Kapu	8003X9KO	S
Wheeler AFB	1227A8KO	S

TOTAL NUMBER OF JOBS: 18

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VEHICLES AND SPECIAL PURPOSE EQUIPMENT

Vehicle/Equipment	Quantity
Trk Maint 2½ Ton V-18 Auger	1
Trk Maint 2½ Ton V-17 Line	1
Trk Maint FM-70 Line	1
Trk Maint 3/4 Ton V-58	2
Trk Cargo 2½ Ton	1
Trk Pick-up 6-passenger Power Wagon	5
Trk Pick-up 6-passenger	5
Trk Pick-up 3-passenger	1
Fork-lift 6,000	1
Fork-lift 4,000	1
Trailer, Lowboy 25 Ton	1
Blower, Gas Engine Portable	2
Pump, Centrifugal, gas 166 GPM	1
Pump, 10 M5P52511K	3
Generator Set	2
Davis TF 1000 Trencher	1
Cable Trailer	2
Jeep/M-151 series	3

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History

of

4830 GROUND ELECTRONICS ENGINEERING

INSTALLATION AGENCY SQUADRON

1 July 1968 - 30 June 1969

Assigned to:

PACIFIC GROUND ELECTRONICS ENGINEERING
INSTALLATION AGENCY REGION, HEADQUARTERS
GROUND ELECTRONICS ENGINEERING INSTALLATION
AGENCY, AIR FORCE LOGISTICS COMMAND

Stationed at:

KORAT ROYAL THAI AIR FORCE BASE, THAILAND

WALTER A. JENNINGS, MSGT, USAF
Historian

CONN A. KING, LT COL, USAF
Commander

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FRONTISPIECE

THAILAND. Home of the 483d CEMIA Squadron.

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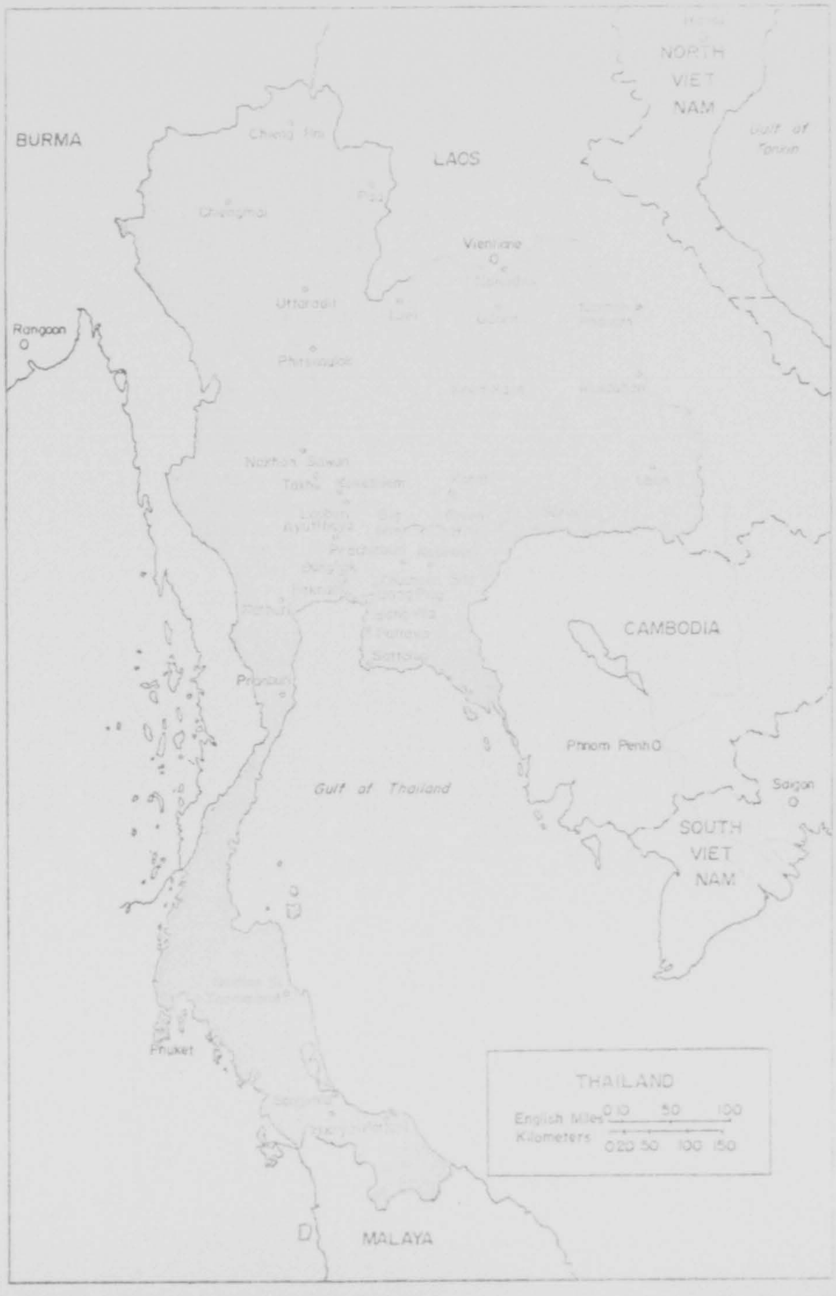

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FRONTISPIECE

Official portrait of Lt Col Coen A. King, who assumed command of the 483d GEMIA Squadron, effective 1 October 1968, Vice Colonel Phil H. Meyer, who returned to the United States for reassignment.

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FRONTISPIECE

Aerial photograph of the 483rd GEEIA Squadron showing the squadron area and three buildings at Korat Royal Thai Air Force Base, Thailand. Photo courtesy of the 601st Photographic Flight (MAC), and the 38th Aerospace Rescue & Recovery Squadron, Det 4, Korat RTAFB, Thailand.

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PREFACE

Fiscal Year 1969 has been the third year of the 483rd's successful operation in Thailand.

It has been a year of achievements beyond those expected of a GEEIA Squadron.

We have had our problems; however, we overcame these and went on to accomplish our mission. We improved our methods and set forth solutions for those who will follow.

This is a record of those achievements, problems, and solutions.

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CHAPTER I

MISSION AND RESOURCES

THE MISSION

The 483rd Ground Electronics Engineering Installation Agency Squadron (AFLC), is responsible for installation and mobile on-site IRAN maintenance of all GEEIA engineered, communication, electronic and meteorological equipment at bases and sites throughout Thailand and in other areas as required. It also provides advisory service and technical service to U.S. Government, USAF, Thai Government and other military agencies as directed.

COMMAND

Lt Col Coen A. King assumed command of the 483rd, vice Col Phil H. Meyer, on 1 October 1968. Col Meyer returned to the CONUS for reassignment.

Col King has remained the commander throughout this historical period.

Even though this organization, prior to Col King's arrival, had a reputation for its outstanding contribution to the SEA effort, Col King, through his endeavor, instilled higher and even more demanding goals. These goals are recorded as accomplishments in this history, and reflects the professional guidance and leadership set forth by him.

In order to maintain a close liaison between the customer and our GEEIA Team Chief's, Col King performed frequent trips for on-site coordination. These trips contributed immensely to establishing a good working relationship and understanding of our mission and how together the job could be accomplished.

ORGANIZATION

The 483rd is divided into seven separate operating parts; Command, Unit Administration, Support, Operations, Workload Control, Wire, Electronics. Even though Workload Control, Wire, and Electronics are directed by the Operations Officer, each has a responsible OIC, who, operates separately to perform his part of the mission. These forces joined together as they are, forms a working capability second to none.

In the early part of CY 1969, each part was brought into line with GEEIA Manual 23-1. Divisions were named Branches and Branches, Sections. This change did not in any way affect the performance or prestige of the personnel involved.

The Quality Control Section was physically relocated and as mission permits, gaining strength.

The Training NCO was moved into a separate office whereby, in the near future, as the workload increases under the [illegible]APS program, personal interviews and records thereof can be maintained in the desired manner.

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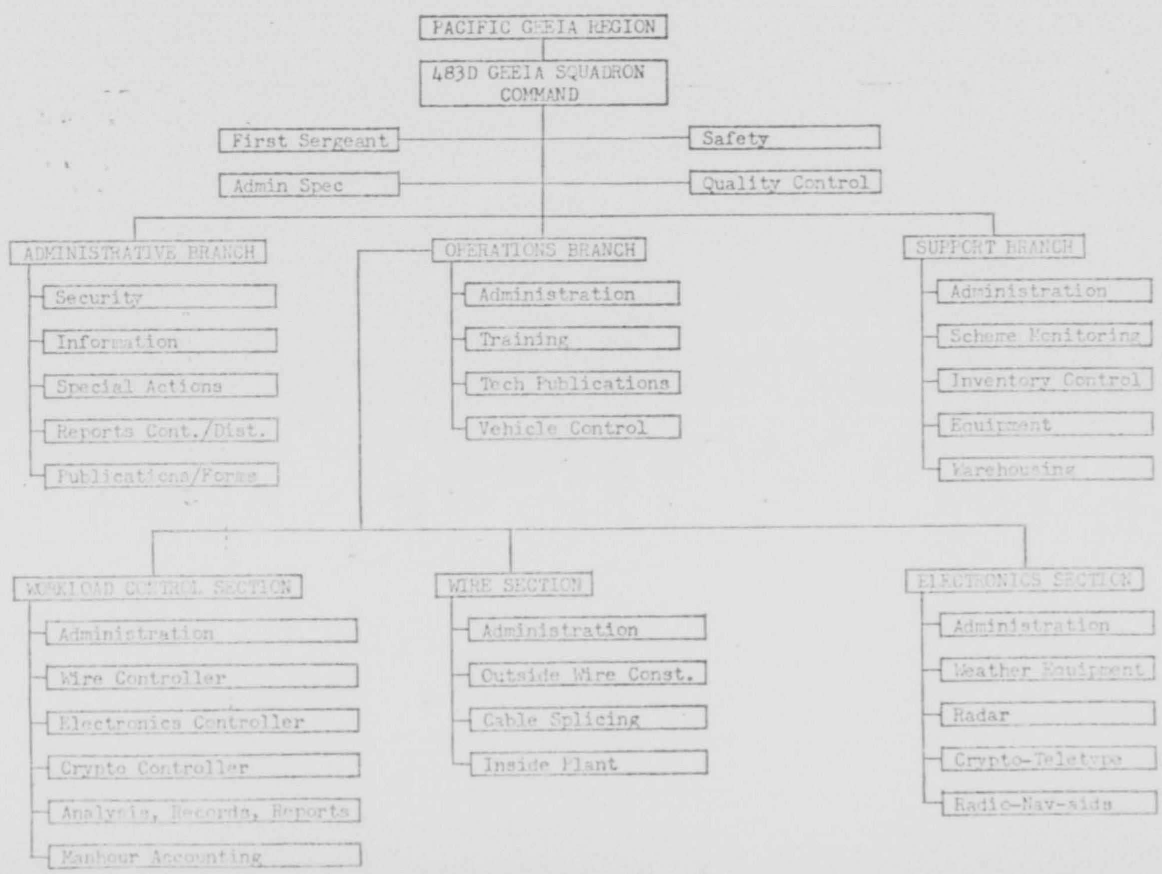

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MANNING

The 483rd has, throughout this historical period, experienced many manning shortages, most of which were resolved through normal gains. One which is recurring and has no apparent solution is no overlap of replacements for key NCO positions. These vacancies, 30 days duration in some career fields, have a lasting affect on job continuity. It can be said that the GEEIA slogan "Can Do" is seriously jeopardized together with the SEA commitment of this organization. Unprojected losses, for reasons of, emergencies at home and air-evac have also been a deterrent to our mission. Losses of this nature have an immediate effect on some jobs and without any hopes of replacements in the near future, causes a realignment of personnel; a definite disadvantage to the job in progress.

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ORGANIZATIONAL MANNING BY AFSC

COMMAND

AUTH: 1 3016
1 70250

OPERATIONS

AUTH: 1	3016
3	3034
1	3044
3	302X0
10	303X2
1	30490
22	304X1
11	304X4
19	306X0
20	361X0
9	361X4
29	362X1
2	363X0
4	472X0
5	551X1
2	702X0

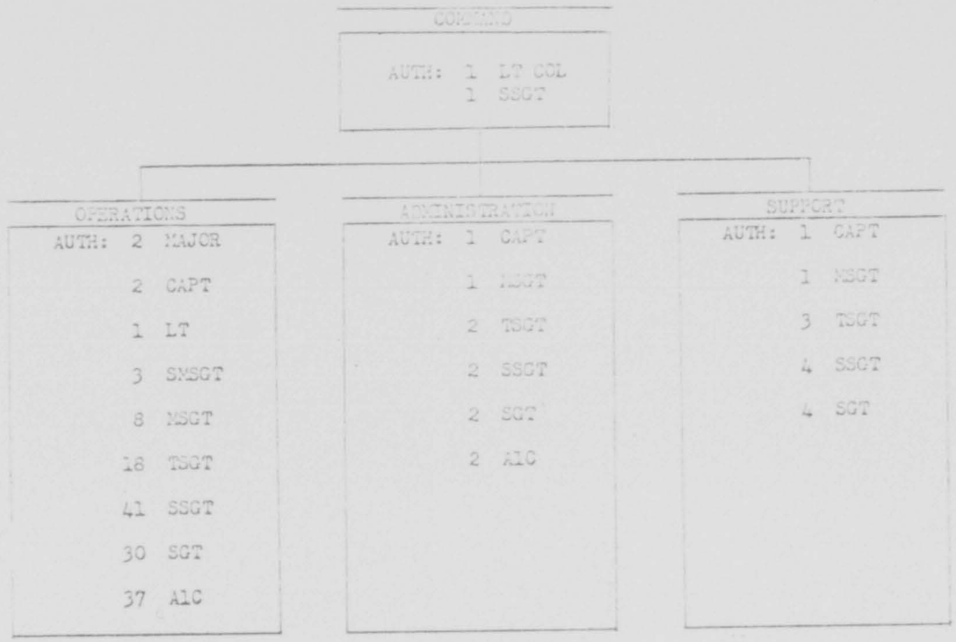
ADMINISTRATION

AUTH: 1	7024
1	01070
1	24130
7	702X0

SUPPORT

AUTH: 1	6424A
7	645X0
4	647X0
1	702X0

ORGANIZATIONAL MANNING BY GRADE



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PERCENTAGE OF ASSIGNED PERSONNEL AUTHORIZED BY SECTION

SQUADRON AUTHORIZED STRENGTH: OFFICERS - 8

AIRMEN - 159

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MORALE

The 483rd's Esprit de Corps was generally high; however, due to circumstances beyond the commander's control, morale dropped sharply for many individual upon the approach of their DEROS. Problems such as late assignments, some arriving two weeks before their scheduled departure, caused discontent and hardships for those persons who had families to relocate. Even after receipt of their assignment, obtaining Special Orders from our supporting CBPC was most difficult. Constant inquiries were necessary to initiate action for publication.

AWARDS

The commander recommended three individuals for the Bronze Star, and thirty-seven for the Air Force Commendation Medal.

There were also Annual and Quarterly awards for deserving individuals:

Senior NCO of the Year 1968:

Master Sergeant Bobby R. Marcum

NCO of the Year 1968:

Technical Sergeant William E. Harvey

Airman of the Year 1968:

Airman First Class James E. Thomson

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NCO's of the Quarter:

Jul - Sep 68	Technical Sergeant Donald E. Goldschmidt
Oct - Dec 68	Technical Sergeant William E. Harvey
Jan - Mar 69	Technical Sergeant Maxie C. Fenton
Apr - Jun 69	Sergeant Bryan D. Bingham

Airmen of the Quarter:

Jul - Sep 68	Airman First Class James E. Thompson
Oct - Dec 68	Airman First Class James H. McCarty
Jan - Mar 69	Airman First Class Dennis R. Hrouda
Apr - Jun 69	Airman First Class Clyde S. Schap

There were 4 Bronze and 6 Silver Zero Defects awards presented to personnel during this historical period.

SUGGESTION PROGRAM

For this reporting period, we received and forwarded 24 suggestions for consideration.

ZERO DEFECTS PROGRAM

Care Forms received was 43, 20 of these were processed favorably, 15 unfavorable and 8 are still being processed.

FUNDS

The FY 1969 Financial program was as follows:

TDY Travel	$161,000.00
Supplies	$ 12,500.00
Contract Transportation	$ 90,000.00
Total:	$263,500.00

CHAPTER II

OPERATIONS

OPERATIONS ACTIVITY

The 483rd Operations Branch experienced a very busy year. The year has been extremely productive with the completion of 185 schemes, including 103 in the electronics area and 82 in the outside/inside plant area. The workload has been highly diversified both in types of installations and location of those installations.

The types of installations covered the entire CEM inventory including: radar, various navigational aids, cable expansions, dial central offices, teletype, radio, and crypto.

The locations included every base and several MAP sites in Thailand from Chaing Mai, Udorn, Bang Sung, and Nakhon Phanom in the North; Prachuap and U-Tapao in the South; and from Kamphaeng Saen, Takhli and Phitsonulok in the West to Mukdahan and Ubon in the East.

Perhaps our most unique job was the installation of a rather antiquated AN/TPS-1 at Bang Sung on Thailand's northern border.

Although most of our workload has been programmed, we were called upon to perform numerous emergency maintenance assists, mostly in Nav Aids, and several emergency installations in direct support of USAF current operations. If we had had no difficulties we would be proud of our accomplishments; we did,

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however, have difficulties and are even more proud of our ability to overcome the problems and still achieve such an enviable record.

During this year, we were constantly plagued with inadequate maintenance and spare parts for our mission essential equipment and vehicles. In the case of vehicles, the problem was primarily the inability of our host base to accept responsibility for and to assure proper maintenance. Our vehicle fleet is quite large and is subjected to much more usage than that normally supported by the Base Motor Pool. Since we drove an average of 50,000 miles per month, most of it on the highway and much of it over rough terrain; we, of course, required more frequent maintenance than base vehicles, which were primarily restricted to on base driving. Neither the 483rd nor the base were manned with a sufficient number of motor vehicle mechanics to successfully cope with this problem. In the latter part of this year, we were able to obtain some relief through the use of civilian contract maintenance. This solution; however, is far from ideal simply because the civilian contractor does not always produce quality work and because the cost of locally procured parts is excessively high.

In the case of our mission essential equipment such as our TF-1000 and J-36 trenchers, our Auburn Tractors, and GPC-28's, the problem was even more critical because the equipment was subjected to constant usage and in many cases, particularly in the

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case of the TF-1000, parts were not available in the USAF supply system. In the spring and early summer of 1969, as much as 60% of our mission essential equipment was non-operational for need of parts or maintenance. We often experienced work stoppage breakdowns, sometimes two or three per day on the same job. We found it necessary to resort to having essential parts fabricated in local machine shops, to canabalize, and more or less make do with what we had. These problems, although not corrected, were somewhat alleviated through contract maintenance, fabrication of spare parts, and replacement of the TF-1000 tracks. At this writing, the outstanding problem is the Auburn Tractor. All such tractors assigned are completely worn out and cannot be maintained in an operational condition. We worked our way around this problem by borrowing graders or tractors from BCE's, or civilian contractors in order to provide a backfill capability. In many cases our Team Chiefs paid for the use of this equipment out of their own pockets - so they could get the job done.

Throughout the year, we have experienced shortages of required skills and excesses in others. This has forced dependence upon augmentation and the use of assigned airmen in jobs for which they are not qualified. In some areas, such as radar, we are authorized and assigned people whom we cannot employ in their AFSC, while in others we have a constant acute shortage such as cable splicing and teletype people. This situation has resulted in our having to use radar trained people as cable splicers and crypto and Nav-Aids people to install teletype.

In spite of these problems, we are proud of our record. Our people were able to install an entire air base, Kamphaeng Saen, faced with the problems described, late or inadequate support construction, late BOM, and constant High Level pressure while providing augmentees to Det 4, PGR, 2875th and 2876th GEEIA Squadrons and still complete an extremely demanding workload throughout the country.

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C-E-M INSTALLATION WORKLOAD

1 July 1968 - 30 June 1969

Scheme Installations Completed	Manhours Available	Manhours Expended
185	121,783	156,068

Breakout of installations by type of C-E-M Facility:

Type of Installation	Number Completed	Manhours Available	Manhours Expended
Outside Plant	55	55,211	70,210
Inside Plant	27	12,749	14,601
Teletype	13	706	776
Crypto	34	19,052	15,381
Nav-Aids	23	19,400	32,500
Weather	15	1,828	1,992
Radio	14	11,335	15,161
Radar	4	1,502	2,447

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SCHEME COMPLETIONS BY MONTH

MONTH & YEAR	NUMBER COMPLETED
Jul 68	16
Aug 68	9
Sep 68	22
Oct 68	9
Nov 68	16
Dec 68	18
Jan 69	11
Feb 69	11
Mar 69	14
Apr 69	12
May 69	7
Jun 69	40
FY 1969 Total:	185

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BRIEFS ON

EMERGENCY WORK PROJECTS

DATE	PLACE	CAUSE, WORK ACCOMPLISHED, MANHOURS
10 Jul	Korat	Bad splice. Repaired splice in cable 01. 593 manhours expended.
31 Jul	Korat	Emergency assist AN/GRN 9B. 104 manhours expended.
3 Aug	Udorn	Bad cable. Replaced 850', 200pr cable. 40 manhours expended.
8 Aug	Green Hill	Defective 200pr cable. Replaced 6,000'. 796 manhours expended.
14 Aug	Takhli	Emergency assist on AN/CRD 6. 80 manhours expended.
14 Aug	Udorn	Defective guys. Repaired guys. 63 manhours expended.
4 Sep	Prachaup	Rectifier problems in DCO. Technical assist. 124 manhours expended.
7 Sep	Nakhon Phanom	Emergency assist for MRD 14. 12 manhours expended.
13 Sep	Ubon	Defective 900pr cable. Replaced 50'. 202 manhours expended.
16 Sep	Takhli	Pre-Iran Survey, CMQ-13 cable. 72 manhours expended.
7 Nov	Green Hill	High winds. Replaced 8 poles and re-hung 200pr cable. 670 manhours expended.

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DATE	PLACE	CAUSE, WORK ACCOMPLISHED, MANHOURS
22 Nov	Takhli	Survey CA pressure system. 64 manhours expended.
6 Dec	Green Hill	Defective antenna. Technical assistance. 344 manhours expended.
16 Dec	Nakhon Phanom	Defective antenna. MDM assistance. 384 manhours expended.
23 Feb	Ubon	Defective TVCR. Technical assistance. 92 manhours expended.
4 Mar	Udorn	Defective cable. Replaced 1,200'. 1,142 manhours expended.
15 Mar	Udorn	Defective TACAN antenna. Technical assistance. 40 manhours expended.
25 Mar	Udorn	Defective TACAN antenna. Technical assistance. 428 manhours expended.
31 Apr	Classified	Commando HASP. 200 manhours expended.

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TAKHLI

MAJOR SCHEME INSTALLATION COMPLETIONS

NOMENCLATURE	SCHEME NUMBER	MONTH & YEAR COMPLETED
Install Autodin Facility	0012H9KO	Jul 68
Replace Cable for GMQ 13	8106X9KO	Sep 68
Install LL Fax Weather R/O	0599A7KO	Sep 68
Tandom Switch	0287A8KO	Sep 68
Outside Telephone Cable Installation	0448A8KO	Oct 68
Teletype Moderization	1604A7KO	Nov 68
Outside Telephone Cable Facility	0931A8KO	Nov 68
Security Switchboard SB55	0493A7KO	Dec 68
Install Crypto Speech	0770A7KO	Mar 69
Install TV Tower	0905A9KO	Mar 69
Install Recorder Reproducer	0309A9KO	Apr 69
Install Weather Recorder	0574A9KO	Jun 69

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DON MUANG RTAFB

MAJOR SCHEME INSTALLATION COMPLETIONS

NOMENCLATURE	SCHEME NUMBER	MONTH & YEAR COMPLETED
Secure autodin terminal	0822A7KO	Sep 68
Install 100 line combined fire and security alert system	0504A7KO	Sep 68
Secure teletype terminal	1058A6KO	Oct 68
CA pressurization of tele plant	2336A7KO	Nov 68
Install three position manual switchboard.	2610A7KO	Nov 68
Install tandem switch trunks	0239A8KO	Nov 68
Install Eng & Inst MAP antennas	0480A7KO	Dec 68
Remove VHF equipment	0729R8KO	Jan 69
Install VHF MAC ACP	2214A7KO	Jan 69
Install 25pr cable to Pre-load facilities.	0840A8KO	Apr 69
Install teletype equipment	1073A8KO	May 69
Autodin bridging	0334A9KO	Jun 69
Pre-IRAN Radio's.	5164LOKO	Jun 69
Cable installation	2319A7KO	Jun 69

5 GEEIA (Thai Females) Augmentees backfilling a cable expansion at Don Muang RTAFB.

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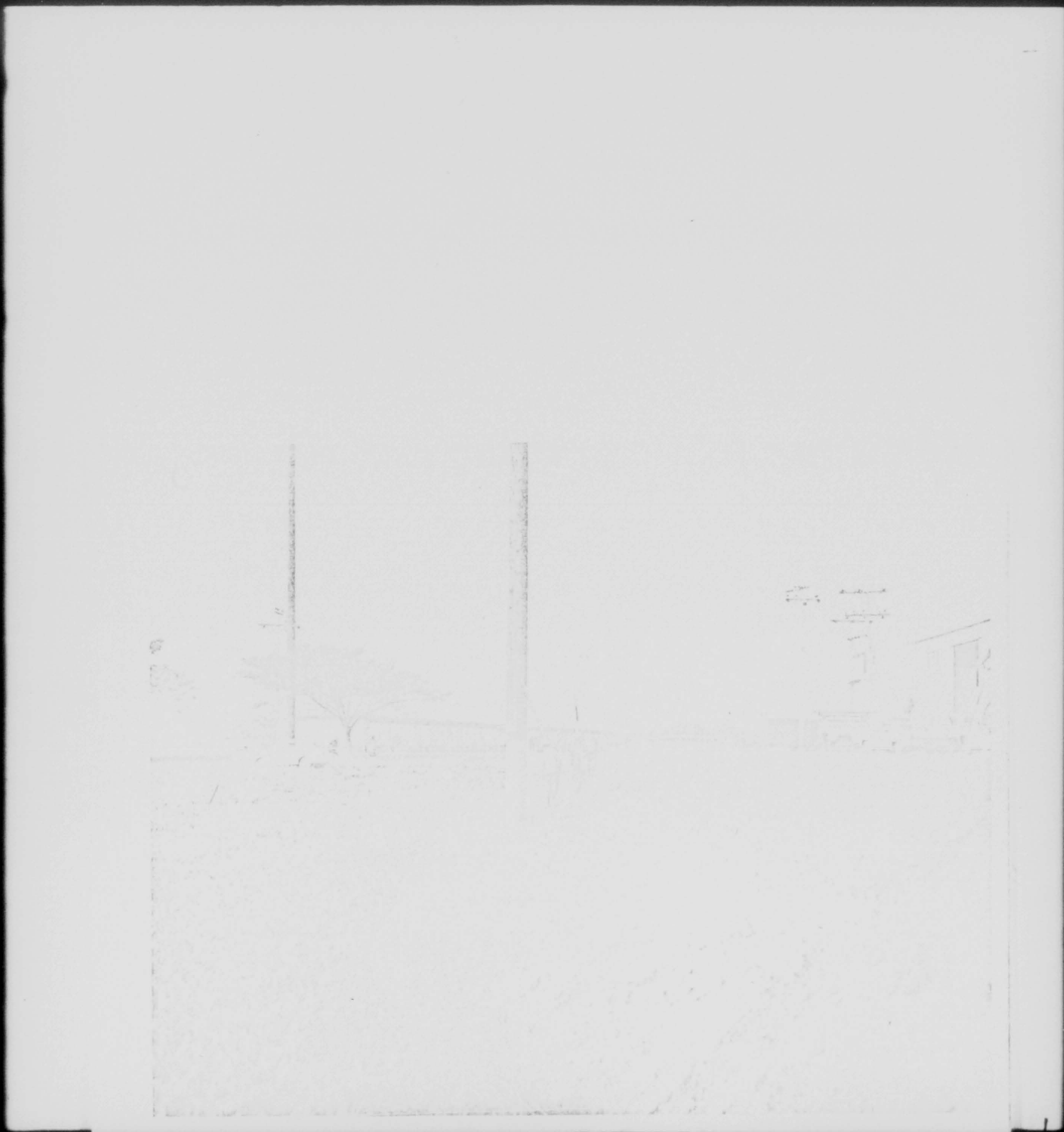

CHIANG MAI RTAFB

MAJOR SCHEME INSTALLATION COMPLETIONS

NOMENCLATURE	SCHEME NUMBER	MONTH & YEAR COMPLETED
Install Operations CA supt between DCO & IWCS bldg.	0925A7KO	Dec 68
Install Operations CA supt for 600 line switchboard	0075A6KO	Jan 69
Install A-0011 dial central office	1104A5KO	Apr 69
Install teletype equipment.	1072A6KO	Jun 69

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MUKDAHAN AFS

MAJOR SCHEME INSTALLATION COMPLETIONS

NOMENCLATURE	SCHEME NUMBER	MONTH & YEAR COMPLETED
Modernization of teletype equipment.	1599A7KO	Jan 69
Install crypto speech.	2590A7KO	May 69

GREEN HILL AC&W SITE

MAJOR SCHEME INSTALLATION COMPLETIONS

NOMENCLATURE	SCHEME NUMBER	MONTH & YEAR COMPLETED
Replace 6,000' 200pr aerial cable.	8102X9KO	Aug 68
Install GPA-64 and [illegible]A-12.	2370A7KO	Nov 68
Install MAP antennas.	0479A7KO	Dec 68
Seek Silence.	0764A7KO	Jun 69

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KOKE KOTHIEM RTAB

MAJOR SCHEME INSTALLATION COMPLETIONS

NOMENCLATURE	SCHEME NUMBER	MONTH & YEAR COMPLETED
Expansion of outside telephone cable.	0918A7KO	Oct 68
Install 400 line central office.	0111A6KO	Jan 69
Install VHF ACA	0962A5KO	Jan 69
Install Operations & QA supt for 400 line switchboard.	0112A6KO	Feb 69
Cable pressurization.	2335A7KO	Jun 69

DCO Building at Koke Kothiem RTAB

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Interior of DCC Building at Koke Kothiem RTAB

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Control Tower at Koke Kothiem RTAB

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MAJOR SCHEME INSTALLATION COMPLETIONS

NOMENCLATURE	SCHEME NUMBER	MONTH & YEAR COMPLETED
Install weather communications	0953A7KO	Dec 68
Install Crypto speech	0787A7KO	May 69

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NAKHON PHANOM RTAFB

MAJOR SCHEME INSTALLATION COMPLETIONS

NOMENCLATURE	SCHEME NUMBER	MONTH & YEAR COMPLETED
Reconfigure CIM Room	0930A8KO	Jul 68
Install telephone set	0791A8KO	Jul 68
Install test bench monitor	0785A8KO	Aug 68
Install Pilot to Dispatch set	1162A7KO	Aug 68
Install UHF - Pilot to Dispatch	1131A8KO	Sep 68
Install teletype facility	0965A8KO	Sep 68
Install weather facsimile	0589A7KO	Sep 68
Install UHF/VHF direction finder	8108X9KO	Sep 68
Install height finding radar	2940A7KO	Sep 68
Install telephone central office	0286A8KO	Sep 68
Expansion of outside telephone cable	2966A7KO	Sep 68
Cable expansion	2965A7KO	Nov 68
Cable pressurization	2337A7KO	Nov 68
Install FTA-16	0605A8KO	Dec 68
Install outside plant cable	0461A9KO	Dec 68
Change antenna - Wilcox 402A	8114X9KO	Dec 68
Install FTA-13	0683T9KO	Dec 68
Install crypto speech	0303A8KO	Jan 69
Install teletype	0637A0KO	Jan 69
Install crypto speech	2591A7KO	Jan 69
Install crypto speech	0275A8KO	Feb 69

NOMENCLATURE	SCHEME NUMBER	MONTH & YEAR COMPLETED
Install HF facility	0559A9KO	Mar 69
Install mobile rapcon	0771A8KO	Mar 69
Project 972	0857A8KO	Jun 69
Remove patching facility	0872A9KO	Jun 69
Install patching facility	0873A9KO	Jun 69
Install cable	1003A8KO	Jun 69

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TACAN Antenna at Nakhon Phanom RTAFB

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TV Antenna at Nakhon Phanom RTAFB

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Height Finder Radar at Nakhon Phanom RTAFB

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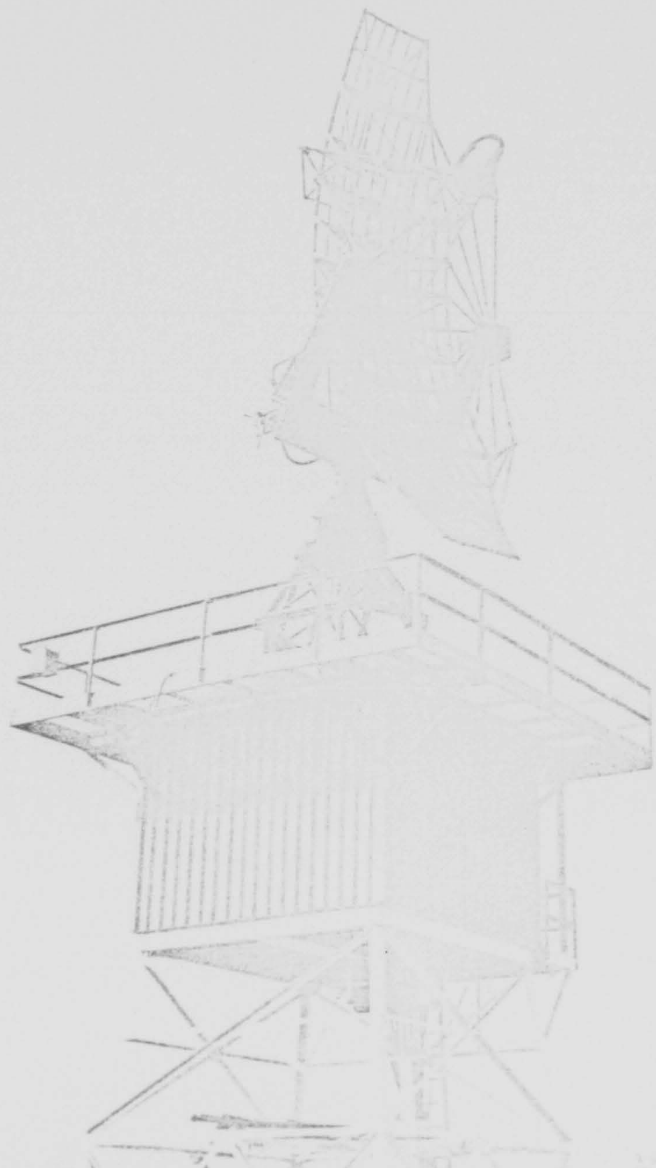

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KORAT RTAFB

MAJOR SCHEME INSTALLATION COMPLETIONS

NOMENCLATURE	SCHEME NUMBER	MONTH & YEAR COMPLETED
Replace 200' damaged cable	8101X9KO	Jul 68
Remove and replace defective RTA-2	8100X9KO	Jul 68
Install IWCS cable	0378A6KO	Jul 68
Rehab antenna	0588A7KO	Aug 68
Install LL Fax weather R/O.	2668A7KO	Aug 68
Install data terminal station	0894A7KO	Sep 68
Install government telephone system	0396A9KO	Sep 68
Install government telephone system	0283A8KO	Nov 68
Install Aux & Satellite system	0489A7KO	Dec 68
Install USAF Comm on L/H Comm system	0505T9KO	Dec 68
Install TV Tower	0904A9KO	Mar 69
Install LL TT H/D term R/O S/C S/R	1074A8KO	Apr 69
Remove and replace USAFSS antenna	1188A8KO	Apr 69
Install control tower equipment	0306A9KO	Apr 69
Install autodin terminal	0341A9KO	Jun 69
Project 972	0865A8KO	Jun 69
Install cable	1143A8KO	Jun 69
Install cable	1152A8KO	Jun 69
PIACCS	0633A9KO	Jun 69
Install cable	8120X9KO	Jun 69
Install weather relay teletype	0933A7KO	Jun 69
Weather Hubbing	0284A9KO	Jun 69

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TACAN Installation at Korat RTAFB

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UBON RTAFB

MAJOR SCHEME INSTALLATION COMPLETIONS

NOMENCLATURE	SCHEME NUMBER	MONTH & YEAR COMPLETED
Install LL TT Dux terminal	2815R7KO	Jul 68
Install Comm Center Aux equipment	2814R7KO	Jul 68
Install FA-3687/A console w/618 call director.	1479A6KO	Jul 68
Install direction finding set	1619A6KO	Aug 68
Install switchboard	2560A7KO	Aug 68
Install 909pr telephone cable	8109X9KO	Sep 68
Secure voice terminal	2583A7KO	Sep 68
Install Air to Ground UHF Comm	0485A7KO	Sep 68
Install LL Fax weather R/O.	0602A7KO	Sep 68
Expansion of outside telephone cable	0379A8KO	Oct 68
Install VHF A/G Comm equipment	0538A9KO	Nov 68
Pressurization of cable	2334A7KO	Nov 68
Secure teletype	1608A7KO	Dec 68
Install CSC switchboard facility	0288A8KO	Jan 69
Expansion of cable	1041A8KO	Feb 69
Install Wilcox 482A TVOR	8115X9KO	Feb 69
Install crypto speech	0276A8KO	Mar 69
Install recorder - reproducer	0308A9KO	Mar 69
Replace antenna	8116X9KO	Mar 69
Install TACAN	0778A5KO	Apr 69

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NOMENCLATURE	SCHEME NUMBER	MONTH & YEAR COMPLETED
Install TV Tower	0492A7KO	Apr 69
Install SB-55 switchboard	0492A9KO	Apr 69
Install wind speed & direction Ind	0947A8KO	May 69
Seek Silence	0774A7KO	Jun 69
Contractor Project	0928A9KO	Jun 69
Install Weather Recorder	0576A9KO	Jun 69
Install Crypto for leased Autodin	0605A9KO	Jun 69
Install Switchboard	0742A9KO	Jun 69

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TACAN at Ubon RTAFB

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TV Tower at Ubon RTAFB

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UDORN RTAFB

MAJOR SCHEME INSTALLATION COMPLETIONS

NOMENCLATURE	SCHEME NUMBER	MONTH & YEAR COMPLETED
Install LL Fax weather R/O	0604A7KO	Jul 68
Replace 4,000' cable	7117X8KO	Jul 68
Repair guys on 3 poles	8105X9KO	Aug 68
Install switchboard	2553A7KO	Aug 68
Install "G" level trunks	0290A8KO	Oct 68
Install VHF A/G facility	1991A7KO	Oct 68
Install recording equipment	0220A8KO	Oct 68
Install HF/SSB antenna	0478A7KO	Nov 68
Install A/G recording equipment	2546A7KO	Nov 68
Install outside cable plant	2338A7KO	Nov 68
Install low level teletype equip.	0394A9KO	Dec 68
Secure teletype terminal	0583A8KO	Dec 68
Secure teletype terminal	2427A7KO	Dec 68
Expansion of outside telephone cable	0222A8KO	Dec 68
Install crypto speech	0779A7KO	Feb 69
Install crypto speech	0781A7KO	Feb 69
Install TV tower	0907A9KO	Mar 69
Install cable support for wind speed direction	8110X9KO	Mar 69
Install TACAN antenna	8117X9KO	Mar 69
Expansion of outside telephone cable	0192A9KO	Apr 69

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NOMENCLATURE	SCHEME NUMBER	MONTH & YEAR COMPLETED
Aeroport teletype	1079A7KO	Jun 69
Install weather recorder	0575A9KO	Jun 69
Antenna relocation	1080A8KO	Jun 69
Pre-IRAN TACAN	5173LOKO	Jun 69
Install Switchboard	0490A7KO	Jun 69

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TV Antenna at Udorn RTAFB

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U-TAPAO AIRFIELD

MAJOR SCHEME INSTALLATION COMPLETIONS

NOMENCLATURE	SCHEME NUMBER	MONTH & YEAR COMPLETED
Install UHF voice radio	0132A3KO	Jul 68
Install UHF voice radio	0244A6KO	Jul 68
Install VHF/UHF voice radio	0218A6KO	Jul 68
Install UHF voice radio	1133A6KO	Jul 68
Install SSB voice HF med power	0679A7KO	Jul 68
Install outside telephone cable	0088A9KO	Sep 68
Install Outside telephone cable	0080A9KO	Oct 68
Install outside telephone cable	0084A9KO	Oct 68
Install HF SSB	0680A7KO	Nov 68
Install BEACON/Radio	0368A6KO	Dec 68
Install CSC switchboard	0284A8KO	Jan 69
Install wind speed & direction rec.	1907A7KO	Feb 69
Expansion of outside telephone cable	1191A8KO	Feb 69
Install crypto speech	2703A7KO	Feb 69
Install recorder/reproducer	0307A9KO	Mar 69
Install government Aux & Satellite system	0491A7KO	Mar 69
Perform on site IRAN	5169LOKO	Apr 69
Expansion of outside telephone cable	0956A8KO	Apr 69
Install TV tower	0913A9KO	May 69
Install teletype	1076A8KO	May 69
Expansion of outside telephone cable	0519A9KO	Jun 69

Low Frequency Beacon at U-Tapao Airfield

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Antenna erection at U-Tapao Airfield

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Antenna erection at U-Tapao Airfield

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[illegible] INSTALLATION COMPLETIONS

[illegible]	[illegible]	MONTH & YEAR COMPLETED
Install Stromberg Carlson X-Y dial	5171L9AO	Sep 68

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KHAO KHIEO

MAJOR SCHEME INSTALLATION COMPLETIONS

NOMENCLATURE	SCHEME NUMBER	MONTH & YEAR COMPLETED
Install Seaitach AC&W G/A	0482A7KO	Sep 68
Repair cable & pole damage	8111X9KO	Nov 68
Antenna assistance	8112X9KO	Dec 68
Secure teletype terminals	0937A6KO	Feb 69

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BANG SUNG

MAJOR SCHEME INSTALLATION COMPLETIONS

NOMENCLATURE	SCHEME NUMBER	MONTH & YEAR COMPLETED
ADGE surveillance radar	0429A7KO	Feb 69
ANTPS1D	2682A7KO	Mar 69

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Surveillance Radar at Bang Sung Thailand

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KAMPHAENG SAEN RTAFB

MAJOR SCHEME INSTALLATION COMPLETIONS

NOMENCLATURE	SCHEME NUMBER	MONTH & YEAR COMPLETED
Outside cable installation	0061A9KO	May 69
VHF omni range	2307A7KO	Jun 69
Installation of DCO	2303A8KO	Jun 69
Installation of GCA	2305A7KO	Jun 69
Installation of Cloud Height Finder	2394A7KO	Jun 69
Installation of Base Cable	2310A7KO	Jun 69
Installation of GMQ-20	2311A7KO	Jun 69
Installation of Direction Finder	2308A7KO	Jun 69
Install teletype	2316A7KO	Jun 69
Install LF Beacon	2309A7KO	Jun 69

TACAN antenna at Kamphaeng Saen RTAB

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Trenching operation at Kamphaeng Saen RTAB

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VOR installation at Kamphaeng Saen RTAB

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Low Frequency Beacon at Kamphaeng Saen RTAB

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DCO at Kamphaeng Saen RTAB

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Control Tower at Kamphaeng Saen RTAB

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PRACHUAP KHIRIKHAN

MAJOR SCHEME INSTALLATION COMPLETIONS

NOMENCLATURE	SCHEME NUMBER	MONTH & YEAR COMPLETED
Replace rectifier and batteries	8107X9KO	Sep 68
Install telephone switchboard	517OL9KO	Jun 69

MAJOR CABLE INSTALLATIONS

LOCATION	NUMBER OF LINES	CABLE FOOTAGE
Korat RTAFB	100 (Security System)	1,000'
	15 "O" Level Trunks	
	2 TV Towers	
Udorn RTAFB	1 Switchboard Position	62,000'
	2 TV Towers	
	5 "O" Level Trunks	
	Base Pressurization	
Ubon RTAFB	1 Switchboard Position	12,400'
	5 "O" Level Trunks	
	100 (Security System)	
	Base Pressurization	
	1 TV Tower	
U-Tapao RTAFB	5 "O" Level Trunks	92,000'
	100 (Security System)	
	1 TV Tower	
Don Muang RTAFB	5 "O" Level Trunks	9,300'
	100 (Security System)	
	Base Pressurization	
	3 Switchboard Positions	
Takhli RTAFB	100 (Security System)	16,900'
	1 TV Tower	
Koke Kathiem	400 Line DCO	68,000'
Chaing Mai	600 Line DCO	13,000'
Kamphaeng Saen	400 Line DCO	82,000'

LOCATION	NUMBER OF LINES	CABLE FOOTAGE
Nakhon Phanom RTAFB	5 "C" Level Trunks	15,600'
	Base Pressurization	
	1 TV Tower	
	TFA Secure Intercom	

TRAINING

The training program within the 483rd has progressed through the year with steady improvements. Training of personnel on job locations has and will always be a difficult one. Due to our operational commitment, it has been difficult at times to keep the trainer and trainee together on the same job. Frequently, adjustments were made by the trainee to adapt to the extended TDY's and adverse studying conditions in the field. However, with ever increasing assistance from the Team Chief's, our job of becoming more in line with Air Force requirements is being realized.

The requirement for a qualified training technician in the 75 career field is becoming more apparent each day. With the new weighted Airman's Promotion System in full implementation, the workload is definitely a full time job. In order not to short change our personnel in training and guidance to an Air Force career, the authorization of a training technician is an absolute necessity.

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TRAINING STATISTICS

MONTH AND YEAR	PERSONNEL TESTED	PERSONNEL UPGRADED	NUMBER IN TRAINING
Jul 68	4	4	34
Aug 68	3	3	34
Sep 68	4	1	33
Oct 68	4	2	36
Nov 68	3	3	33
Dec 68	0	1	37
Jan 69	6	1	40
Feb 69	5	5	34
Mar 69	4	3	35
Apr 69	0	1	34
May 69	0	8	29
Jun 69	0	2	23
Total	33	34	Monthly Average: 33.5

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VEHICLES

Properly operating vehicles, remains one of our primary concerns. The lack of adequate periodic maintenance from our support base has caused major mechanical failures, resulting in a reduced vehicle operating force for scheme support.

Our support base indicates that they do not have the personnel or replacement parts to properly care for our compliment of vehicles, especially our heavy equipment.

However, arrangements with the Base Procurement Office to provide contract maintenance on vehicles located at remote installations worked out satisfactorily. Under these arrangements, our heavy maintenance personnel surveys and selects a commercial repair facility near our work base. Our maintenance people inspects the work and pay in cash from Impress Funds or by voucher to the Base Procurement Office. This provides a quick reaction capability in emergencies. We are also looking into the possibility of providing special repair parts to these contractors in hopes of expanding contract services.

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VEHICLE WASH RACK

Under the squadron self help program, squadron personnel constructed a vehicle wash rack. This was one more internal step to help keep our vehicles in a better state of appearance and repair.

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VEHICLES - AUTHORIZED AND ASSIGNED

TYPE OF VEHICLE	AUTHORIZED	ASSIGNED
Jeep, ¼ ton, 4x4	20	19
Crew Cab, 3/4 ton, 4x4	26	23
Truck, Multi-stop	1	1
Truck, Tele Maint Const V-11	15	11
Truck, Cargo, 2½ ton	4	0
Truck, Cargo, 5 ton	2	4
Truck, Tele Maint Const V-17	0	5
Truck, Tele Maint Const V-18	0	4
Truck, Tele Maint Const V-1700	12	5
Tractor, 7 ton, Semi	0	1
Tractor, 10 ton, Semi	2	0
Tractor, Farm	5	5
Dozer, D-7	2	0
Tractor, TD-15	0	2
Trencher, J-36	4	4
Trencher, TF-1000	5	5
Auger, Earth	2	2
Fork Lift, 15,000 lbs	1	1
Fork Lift, 6,000 lbs	4	3
Fork Lift, R/T, 6,000 lbs	2	1
Wrecker, M-62	1	1
Trailer, Jeep, ¼ ton	5	20
Trailer, Chasis	3	3

TYPE OF VEHICLE	AUTHORIZED	ASSIGNED
Trailer, Bolster	1	1
Trailer, Van, Semi	1	1
Trailer, 25 ton, Semi	4	5
Trailer, 7 ton, Cable	8	8
Trailer, 10 ton, Cable	1	1
Trailer, Construction	1	0

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SQUADRON VEHICLE MILEAGE

1 July 1968 - 30 June 1969

MONTH & YEAR		MILES DRIVEN
Jul 68		51,062
Aug 68		58,074
Sep 68		49,953
Oct 68		50,581
Nov 68		56,583
Dec 68		45,991
	1968 Total	313,244
Jan 69		50,399
Feb 69		58,941
Mar 69		37,014
Apr 69		45,042
May 69		43,647
Jun 69		44,535
	1969 Total	279,778

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CHAPTER III

SUPPORT

SUPPORT ACTIVITY

The 483rd's Support Branch has been able to support scheme installations exceptionally well. With improved methods and leadership, this well managed element has constantly shown the "Can Do" spirit and has on many occasions been the key to our success.

WAREHOUSING AND STORAGE

A new 8,000 sq ft warehouse was completed in March 69, located adjacent to our old warehouse, this additional space allowed for a more orderly storage of materials. Scheme equipment requiring inside storage is now protected from the extremely inclement weather here in Thailand.

In addition to our present outside storage area, we obtained 40,000 sq ft of space and with self help, fenced the perimeter. This area has allowed the separation of disaster stock from rotating scheme materials.

EQUIPMENT MANAGEMENT

A new additional room was built, through self help, adjacent to the support branch office, linking the test room with the rest of the supply operation. This room houses our equipment personnel, and has provided a better working area for transacting issues and turn-ins.

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A new tool and equipment storage and issue point was established at the front of our warehouse for more readily accessible property.

Much tighter controls were placed into effect on issues and turn-in of equipment items. Review of EAID property was conducted in November and December by the various branches to determine those items not required and at the same time new items were requested to better equip our personnel in the field. Excess property is promptly turned in to the Host Base Supply.

New accounting and handling procedures were put into effect on test equipment. We have a constant flow of test sets being processed in and out of PMEL for required calibration, each set is controlled by serial number.

Disaster storage is controlled thru the Equipment Section, records are being maintained up to date and inventories performed as required. Disaster stock is separated from other scheme materials.

SCHEME MONITORS

We improved our efficiency by moving the Support Branch Scheme Monitors immediately adjacent to the Operations Workload Control Section for closer coordination.

PROJECT FOC/972

The FOC/972 Project is now in its final stage. This project had many loose ends but with the present Tele-Sig representative, Mr. Ulman, all transactions have been completed and all

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property that was not used for this project has been returned to the 483rd. A complete item by item inventory was conducted and a list of assets on hand was hand carried to Pacific GEEIA Region by MSgt Ammons, during his last assistance visit.

Many dollars were involved in this long project and with the close coordination between Mr. Ulman and the Project Monitors, we are sure that 99% of all property that was ear-marked for this project has been accounted for. Either being installed or returned to our storage area.

At this point, we are awaiting disposition instructions for property now in our possession.

INVENTORY

September was a busy month with the inventorying of over 60 schemes, and shipments of 246,000 pounds of material. Cable inventories were conducted and the storage area was realigned and each reel tagged and identified by scheme number. Those reels not marked by size were identified and tagged with help from the Wire Branch.

Interior of Main Support Warehouse.

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New Tool Issue Point, located inside the main warehouse, across from the administrative office.

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Interior of new support warehouse and storage of scheme materiels that in the past were stored outside.

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Outside storage of scheme materiels

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Self help fencing of our additional 40,000 sq ft cable yard

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SCHEME MATERIEL SUPPORT

Tonnage of Scheme Materiel on Hand:	6,594 tons
Tonnage of Scheme Materiel Shipped:	1,319 tons
Feet of Cable on Hand:	3.4 Million
Feet of Cable Shipped:	1.5 Million

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MATERIEL RESOURCES

Tools & Equipment:	$ .2 Million
Line Items	
Authorized - 1,311	
On Hand - 1,158	
Vehicle Fleet:	$ .9 Million
Authorized - 137	
Assigned - 136	
Rotating Scheme and Disaster Stock Items	$1.5 Million

CHAPTER IV

QUALITY ASSURANCE AND SAFETY

QUALITY CONTROL

As the workload of the 483rd continued to increase, maintaining a high quality in the installations of schemes became difficult if not impossible with only one quality control inspector.

In order to perform the inspections properly, we increased our strength to four inspectors. With this, more frequent quality control inspections were performed at all Thailand installations where 483rd GEEIA personnel were deployed with schemes in progress.

In most instances, compliance with procedures was exceptional, discrepancies were minor and corrected on the spot.

The 483rd's Quality Assurance program was up-dated on 1 April 1969 with the implementation of GEEIA Manual 74-1. Since its implementation, the quality assurance techniques have been instrumental in indicating deficiencies in such things as engineering, scheduling, material maintenance and installation processes and procedures.

SAFETY

The 483rd Commander incorporated stringent procedures for on-site safety and vehicle operation in hopes of reducing accidents.

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However, we continued to have problems. Most of our accidents center around vehicles, 6-PAC's and V-11's. These vehicles appear to be unstable, especially when heavy breaking action is necessary. Most always, one of the wheels will lock, causing the vehicle to skid. Mud-Grip type tires, on hard surfaced roads, contributes to this skid-prone condition. Efforts to procure commercial type road tires has been partially successful. Other contributing factors to these accidents were the age and lack of experience of some of our drivers. Most of our accidents were caused by E-4's and below, in the 19 to 25 year group. These operators also appeared to be more accident prone during their first and last months of their tours. To help deter this situation, we developed and put into practice a 10 point vehicle safety plan which has aided immeasurably in our endeavor to prevent accidents.

Our plan is as follows:

I Over the road drive training for every new driver.

II A driver and an assistant is required in the front seat of all vehicles, on public roads.

III An experienced driver will accompany all new crews to the job site.

IV An overall squadron safety briefing will be given every month.

V The Safety NCO will brief the driver and his assistant on safety before each over-the-road trip.

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VI Limit the number of trips by vehicles. Utilize air travel when feasible.

VII Give a special safety briefing to each individual 30 days before rotation.

VIII All driving will be confined to daylight hours. Road speed will not exceed those authorized for military vehicles in Thailand.

IX Inspect each vehicle before every trip.

X To inform squadron personnel of the commanders intent of action concerning accidents.

To further reduce the possibility of accidents, we started transporting many of our V-11's and 6-PAC's to and from the job sites by commercial carrier. Of course, there were times due to the site locations, emergencies, etc., that this was not possible or economically feasible. Never-the-less, we greatly reduced our exposure rate. We limited over the road operators to SSgt's or above; however, no rank restriction was applied to on-base driving. This reduced the number of road miles and increased the utilization of experienced operators.

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ACCIDENT AND INJURY STATISTICS

The following is a comparison of accidents, lost time and cost figures for fiscal years 1968 and 1969:

	FY 68	FY 69
Private Motor Vehicle Accidents	0	1
Private Motor Vehicles Injuries	0	1
On Duty Injuries	2	0
Off Duty Injuries	1	1
Fatalities	0	0
Civilian Injuries	0	0
Air Force Motor Vehicle Accidents	0	4
Air Force Property Damage	0	0
Non-Reportable First Aid Injuries	5	8
Lost Time In Days	8	5
Cost	$560.00	$1,095.00

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DRIVING IN THAILAND

There are few highways in Thailand compared to western countries. These are generally narrow and conjested. Many are unimproved and hazardous because of heavy dust in the dry seasons which turns to deep mud during the rainy season.

There appears to be approximately a 10 to 1 ratio of trucks/buses to private vehicles in Thailand, with a recognized official speed limit of 60 MPH. The heavy truck/bus traffic causes considerable variation in inline traffic speeds, increasing the road danger.

Driving experience and discipline of the Thai driver varies from near none to considerable. There is no requirement to provide proof of driving ability to obtain a drivers permit. The law of the road is the largest vehicle has the right of way.

All traffic moves on the left, opposite from the U.S. All U.S. military vehicles are equipped for right hand driving, a condition which puts our drivers at a safety disadvantage. Therefore, we are required to essentially provide two drivers for every vehicle. The right hand individual acts as the eyes of the driver for right hand on-coming traffic.

The squadron averages in excess of 40,000 miles per month over-the-road driving, which requires stringent vehicle safety procedures to eliminate accidents.

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CHAPTER V

FACILITIES

GENERAL

With the 483rd self help programs and newly base constructed facilities, our personnel are enjoying some of the finest base facilities in Thailand.

Major improvements have been made in living conditions and off duty entertainment.

RECREATION

The squadron self help program provided for off duty entertainment, horse shoe pits and volleyball courts with flood lights for night time use in the NCO and Airmen quarters area.

A Day Room for the NCO's has been designated and lounge furniture is on order.

An Airman's Recreation Room between the hootches has been approved for construction; however, due to fund limitations, we must wait until these funds are released from BCE and made available for this project.

A TV station was constructed on Korat RTAFB with our assistance, and TV sets have been installed in each Airman's hootch and one in the NCO quarters Day Room.

SERVICES

A new Library, Education Center with courses given by the University of Maryland and Base Exchange was completed during this reporting period.

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Our NCO's Barracks or "Hootches" as they are referred to in Thailand. There are 32 two man rooms, with a Latrine, Day Room and Recreation Room. These buildings are open air constructed with overhanging roofs to allow for maximum ventilation and protection from the sun.

The maintenance of the buildings is accomplished by the base civil engineer; however, the landscaping and maintenance of the grounds is accomplished by our squadron personnel.

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Our Airmen's living quarters. E-4's and below are housed in seven, 12 man and seven, 16 man hootches. These barracks are open bay, open air construction.

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Interior of our airmen's living quarters. Clothing lockers are inset flush into the side wall, giving maximum inside living space.

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Korat RTAFB TV Station with GEEIA constructed antenna tower.

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Base Library and Education Services Center

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Korat Base Exchange

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CHAPTER VI

SUBJECT OF SPECIAL HISTORICAL SIGNIFICANCE

COMMUNITY RELATIONS

Consistent with our efforts to improve our relations with the Thai Community, MSgt Bobby R. Marcum and Sgt Robert E. Charbonneau, voluntarily participated in Project PET. Specifically, this is "Project English Teach" and was initiated to give regularly scheduled English lessons to Thai grade school students at their schools in downtown Korat.

1Lt Howell F. Riffey, our Administrative Officer, is also involved in the teaching of English at a higher level to Thai National personnel employed at Korat RTAFB. Classes are held daily in the Base Education class rooms. One class has graduated and another is presently in progress at this writing.

SPORTS

By entering a basketball team in the Base Intramural Basketball League, during September 1968, the 483rd formally entered into organized competitive sports at Korat RTAFB. This is the first time that a GEEIA Squadron has participated in organized sports at this station. In November, the squadron fielded its first softball team.

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HISTORY OF THE 485th GROUND ELECTRONICS ENGINEERING INSTALLATION AGENCY SQUADRON

1 JULY 1968 - 30 JUNE 1969

Prepared by

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8 July 1969

AIR FORCE LOGISTICS COMMAND
UNITED STATES AIR FORCE

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CONTENTS

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Commander's Comments

During the period July 1968 through June 1969, the squadron passed through a significant stage of growth. Since its activation 15 April 1966 and throughout FY 68, total emphasis was placed on mission accomplishment at any cost and included living quarters. The squadron's accomplishments during this period were highly impressive.

As the USAF war effort continued through FY 69, every major support activity became increasingly aware of shortages in manpower and materiel, and was forced to exercise more meaningful management controls. The squadron continued to benefit from the augmentation concept, but quality control problems increased. Team Chiefs performed outstandingly in accomplishing difficult installation jobs, frequently exposed to enemy mortar and rocket attacks. However, the extensive quantity and variety of installation jobs and the requirement to move teams about the country, coupled with periodic emergency support requirements, generated a significant personnel control problem. Although large groups of technicians were concentrated at major locations such as Tan Son Nhut and Da Nang Air Bases, there was also a constant flow of individual traffic arriving/departing Cam Ranh Bay Air Base as well as many other locations in Vietnam.

Directly related to the great emphasis placed on mission accomplishment was a corresponding decrease in concern and control of non-operational matters. Weapons assignment (M-16 Carbine) and documentation degenerated to the point where at one time, approximately thirty-four (34) M-16 carbines could not be realistically accounted for. Proficiency and up-grade training (OJT), APR control, awards and information programs were typical of the areas badly in need of better management.

As a result of continuing, aggressive actions on the part of various branch OICs and NCOICs, Field Project Officers and Team Chiefs, the squadron developed positive control of all personnel movement. Detailed procedures were instituted to insure no individual in the country moved from one base to another without specified approval.

Non-operational areas began to receive systematic management attention at every level of supervision. By March 69 the squadron was credited with the maximum points possible for OJT.

An exceedingly difficult APR situation was stabilized and improved to the point where not more than four were submitted late between February and June 69. Proper alignment of reporting officials however, did generate twenty-three late APRs in January 69. Additionally, the Region Management Performance System has awarded the squadron a maximum number of possible points for News Releases since January 69.[1]

Daily stand-up briefings for the commander and staff were inaugurated 1 August 68 using the Schemes in Progress Display Board. Although the format of the briefing and the displays have evolved, the primary purpose of keeping the commander informed of squadron progress and mission status was accomplished.

All Field Project Officers were placed directly under the Operations Officer to divorce them from such branch limitations as skill orientation and seniority considerations. This has enabled the Operations Officer to exercise better management of field activities.

Monthly Operations Conferences were started in December 68, held in the commander's office and attended by key branch personnel, Field Project Officers and all NCOs in grades E8/E9. Additionally approximately 85% of deployed Team Chiefs were brought into station in conjunction with the Operations Conference to attend a monthly Team Chief meeting and NCO/Officers Call.

Quarters for squadron enlisted personnel continue to match the base average, but did not compare well to newly constructed, two-story, seventy man dormitories. The squadron is programmed to move into such dormitories adjacent to our work area on the West side upon completion of construction at an undetermined date. With our personnel utilization rate rapidly approaching 90% over the last six months, excess living space is the rule rather than exception. During the latter portion of this period, strength could neither support or justify assignment of recurring base details.

1. Pacific GEEIA Region Management Performance System, January 1969 through May 1969.

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The Operations portion of the Squadron History is divided into three sections, Workload Control, Electronics Branch, and Wire Branch.

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WORKLOAD CONTROL

From 1 July 68 through 18 June 69 we completed 247 installation schemes and 22 emergency work orders.

As the Control Room developed status display boards were added to the original schemes in Progress board to monitor all areas of management. Subjects currently presented Are:

Mission Summary
Command Control of Management Resources
Management Data Summary
Manning Date
Status of Training
Vehicle Summary
Trencher Status
Vehicles VDP/VDM

Manhour accounting has received a great deal of attention, with emphasis on accurate, timely reporting. We tried to improve the degree of real time reporting from the field, first by message inputs, finally with a test of a form of exception reporting, before returning to using individual 77's, hand carried to respective branches at least once a week. In April the last method was put into effect, and accuracy has improved encouragingly.

The value of the circuit Rider has been demonstrated many times over. Repeatedly, he has made first hand reports concerning conditions surrounding support construction that varied widely from those reported by the customer and host base Civil Engineers. He has discovered errors, or deviations from the SCL, early enough to allow time for them to be corrected, either with no impact on the schedule or with minimum delay. He has served as a technical consultant to Civil Engineering Agencies on many occasions, particularly in the realm of communications center building grouding, and in checking the accuracy of dimensions and alignment of antenna tower footings.

Increased emphasis has been placed on keeping work schedules within GCD's. We were frustrated many times by instances of being forced to start a scheme will ahead of schedule, whether all prerequisites were complete or not, and then have the GCD advanced in spite of our stand that the time frame would extend past the new schedule. Overall, over the past twelve months, constant exchange of views with GEPO has proved fruitful, and scheduling has improved immensely. We hope part of the reason for improvement is that we have improved the amount and usefulness of the information we forward.

WIRE BRANCH

Inside Plant

Dial Central Office completions include clearing exceptions at Da Nang AB, RVN, a 1000 line addition at Nha Trang, a new 1500 line DCO at Phu Cat and Secondary Trunking equipment installed at tandem switch sites throughout the country.

DCO work is in progress, at years end, to add 1000 lines at Plieku and Binh Thuy and install a new 2500 line office at Cam Ranh Bay. Some jobs, particularly the addition at Nha Trang and the Tandem Switch Work, have progressed smoothly. Others were plagued by material problems and building availability.

At Phu Cat, we first saw the ravages of extended periods of outdoor storage of DCO equipment. Though packed in outside storage containers, electronic equipment was destroyed by condensation. The scheme had been shipped to site a year before, and no inside storage was available. The scheme was delayed repeatedly by non-availability of the building. When it was finally ready, our team moved the equipment inside. Almost immediately a mud slide caused by heavy rain inundated the building and imperiled the equipment. Quick work by the team saved a disaster. After more delay for cleanup and landscaping to provide drainage, the scheme was under way. All iron work required complete corrosion control, sanding and repainting. This alone cost nearly six weeks of time. The toll test board was completely ruined by water as were many lesser items. When all terminal blocks had been installed, the discovery was made that terminals were oxidized and required excessive heat to make solder flow. More time was lost in trying to terminate wires without burning insulation. Apperancewise the job was not one of our best, and the terminals are undergoing metalurgical study in Hawaii to determine a cleaning method.

By lessons learned at Phu Cat, teams at Binh Thuy, Pleiku and Cam Ranh Bay were forewarned, and terminal lugs were hand tinned with solder before installation. It was tedious, time consuming work, but no more trouble has been caused by burned wires and non-flowing solder.

At Da Nang, problems included material shortages, lack of sufficient multiples, disrupted work on completing the DCO and installing additional trunks for Tandem Switch. The problem arose from a lack of engineering understanding that any 500 line addition will not fit any DCO. Allowances must by made to provide facing equipment according to the final number of switchboards the DCO will have.

WIRE

Outside Plant

Major cable schemes were completed at Binh Thuy, Tan Son Nhut (2), Da Nang (2), Phan Rang (2), Plieku, Bien Hoa, Phu Cat (2) and Tuy Hoa. Lesser cable schemes, such as those supporting Tandem Switch Centers, Navigation aids, and additions to base distribution systems, were completed at nearly every Air Base in the country. Cable pressurization of the Phu Cat Cable system was completed; similar pressurization is near completion at Tuy Hoa and the project at Bien Hoa is approximately 50% complete.

Construction teams completed an AB 258 tower for an FPS-90 Radar installation at Pleiku, and have one under construction on Hon Tre Island in the Bay of Nha Trang. A rigid radome nears completion on the FPS-8 radar on Hon Tre. Two new antenna farms for Ground-Air Transmitter Receiver sites are complete at Plieku and Bien Hoa, and antenna farm rehabilitation was performed at Tan Son Nhut and on Monkey Mountain near Da Nang. The latter part of a major GATR site rebuild, deserves special mention.

The Monkey Mountain GATR Rehabilitation required sixteen new poles, three sixty feet long and the rest ninety feet, in two phases. In October an emergency requirement developed to erect two ninety foot poles, not originally part of the scheme. A team was hastily assembled to hand dig (jack hammer/sand picks) the 4 X 10 foot holes, pour concrete footings and receive and guide the poles. Coordination with helicopter agencies produced a Marine HH53 helicopter to transport the poles to the mountain and place them. The crew then guided the poles and poured the concrete base. Lessons learned from the activity were many and important. When the holes were finally prepared for the balance of the scheme, the poles were completely prepared with all rigging, pick-up areas prepared, step by step plans prepared and teams drilled through procedures using mock up techniques. Again the Marines supplied the helicopter, plus back pack radios for both the pick up and emplacement points. Preparation payed off, and, except for weather intervention, the poles were set without incident.

Problems

Schemes were delayed by lack of personnel, material shortages and inoperative trenching machines.

Although we planned far in advance for augmentee replacements, we were stalled by demands for rejustification of requirements. Instead of a transitional overlap, we experienced gaps of from 5 to 20 days when we were reduced to a <u>third</u> of

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our required splicers and construction specialists. This happened in December 68 and again in late May, early June 69. In December time lost on jobs impacted work schedules through February 69.

Trenchers presented constant problems all year. The J-36's are old and have had hard use. Maintenance not withstanding, metal fatigue started taking a toll, and basic frame parts failed, requiring extensive welding and patching. Parts are slow to arrive, and a J-36 may be sidelined for months for one or two parts.

The Davis 1000 trenchers were a story in themselves. Obvious not meant for even medium duty or other than level terrain, they are a misfit under Vietnam mission conditions. Tracks are being replaced by a major modification kit, and reliability should improve. The rest of the machine requires extensive maintenance, more restorative than preventive. One operator lavished extra preventive maintenance on his machine, followed by an average of three hours after duty day repairing fittings, replacing hoses and having welding done at the automotive shop. One day he went in the hospital, and the trencher collapsed within a week.

As with the J-36, parts are a constant problem with the Davis. Machines waiting weeks and longer for parts are not uncommon.

As the year progressed, and we wrestled with huge cable schemes, 200-400,000 feet of trenching, we were impressed by the futility of such enormous undertakings under the auspices of a single scheme package. Partly because of delays going back to repair damage to earlier portions, we were burdened with schemes actually nearing the end of their second year in progress. Some of them had as many as ten Engineering Change Orders, issued to adjust to changing requirements and changing physical enviroments of the cable route. Since the customer needed portions of the system, he accepted it on a letter of acceptance, or a partial AF7088. Often before the final leg was sold, the earliest leg was inadequate or in need of repair. Off and on during the fall of 1969 and early winter of 1969 we probed Region agencies and customers on the subject of breaking the large schemes into several smaller schemes; each to be finished, accepted and cleared individually. Finally, in March, the theory was accepted after detailed review of particular schemes in question. After some misconceptions were cleared by intraregion headquarters conferences in April, squadron wire branch personnel resurveyed each portion of each scheme to be divided and time framed installation periods. Region Operations issued scheme numbers for the newly designated segments and work units for old and new schemes. We feel that management of

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the smaller schemes will be greatly simplified, including work equipment and personnel management. At least as important, we feel that our product will be better, and our customer will be better served.

Emergency Work

Cable repair crews responded to thirteen emergency cable outages that were beyound the scope of-operator repair capability. Most outages were caused by water entering cables damaged by various construction agencies. Two cases were cables, lying on the ground, burned in grass fires set by unknown parties. In addition, a regular scheme was extended to provide rehabilitation of battle damaged cables in an above-ground cable vault.

A construction crew journeyed to Nuy Ba Dinh Mountain and Tay Ninh City on an emergency technical assistance requirement. Equipment and requirements were unknown before hand restricting knowledge of type of tools to take, but the team's extreme ingenuity and "Can Do" earned effusive praise from the customer.

In response to accusations of poor installation practices generated by a customer and supported by a contract survey team, an inside plant team reviewed problems at the Bien Hoa DCO. The facts proved poor maintenance practices on the part of the customer, and illuminated for him a problem that existed nearly country wide. Because of rotation and no recurring training, he had no maintenance personnel familiar with Stromberg Carlson X-Y switch equipment.

Crypto-Teletype

Communications centers were installed at Phu Cat, Qui Nhon, Tan Son Nhut and Binh Thuy. Some were Base Communications Centers, some were smaller Airlift Command Element Centers. A major rehabilitation of the 7AF Command Post Communications Center was completed in May. A permanent weather teletype center at Tan Son Nhut is in progress, as is a DCS Autodin scheme.

Although most of the ALCE installations were relatively trouble free, the major jobs were plagued with troubles ranging from erroneous engineering, to customer changes, to incorrect or inoperative equipment, furnished by ourselves or the customer. Extensive delays were encountered in construction of buildings. Though a building might have been built, all too often none of the security provisions required had been included. In some cases delays in completing such work extended to six and eight months.

A classic among troubled jobs was the Flight Line Communications Center at Tan Son Nhut. Construction support was delayed several times, customer equipment was faulty, engineering was incomplete and the job saw no less than three different Team Chiefs, each with his own ideas of how to overcome the various obstacles. While any one of the team chiefs would have finished the job in time, each rotated before he could complete his work, and a new one took over, reevaluated the situation, regrouped and proceeded. As the year passed the shortage of teletype technicians bore more and more heavily on us. Though we have always known that our teletype manning was inadequate, the large communications center installations emphasized the fact. Much of the work involved teletype equipment, yet we have only two technicians authorized and rarely are both slots filled.

Project Seek Silence loomed large in the summer of 68, when we knew little more about the program than its size. In late fall, however, the program lifted off the ground in earnest. Until December we had one or two people who were trained on the equipment. TSgt Elwood Beck was the team chief, and his team wrote a new record book for installing the system. By mid-winter TSgt Beck's team had cut installation time from 21 to 10 days. Shortly thereafter, a round-the-clock effort at Dong Ha resulted in a three day installation, and TSgt Beck became "The Phantom". A second team chief was established, by dividing TSgt Beck's team and repopulating both teams. Competition between the teams reduced installation time of a Seek Silence scheme to an average of six days, yet quality stayed high as witnessed by letters of appreciation. TSgt Stanley P. Bieniek Jr. became "Phantom II" and the year closed with the bulk of Seek Silence completed, on or ahead of schedule, with no exceptions. Seek Silence schemes have been completed at 21 sites since December.

RADIO

The first five and a half months of the year were frustrating for radio technicians and their supervisors. We had no radio work of any kind, except Ban Me Thout tacan, which employed a few people spasmodically.

Radio people were employed as construction helpers, radar augmenters, radio operators for the Single Sideband net, and some were loand to AFCS units. In December the jobs started to jell, and by January 69, through our own work and assistance to AFCS, our radio technicians were working in their own career field. Mid spring saw radio demands that eliminated the SSB operators, called back most of our loans, and employed cryptographic technicians as augmenters. Ironically, while our radio-Flight Facilities work fluctuates mightily, and half of a year will see no work, AFCS units in RVN are critically short of the skills.

At mid year, the determination was made that local GEEIA squadrons would react to Navigation Aids emergency requests, and our Flight Facilities Technicians had a new horizon. Between Tacan outages and serious indications, Tacan installation and removal/relocation requirements, the Flight Facilities Technicians have been busy.

Ground-air-ground radio systems are nearing completion at Plieku, Bien Hoa and Tan Son Nhut. They are large schemes, employing an average of ten technicians each for approximately six weeks.

RADAR

The radar section has never been over manned, as it has but six technicians in ATC Radar and 5 in AC&W Radar. They have been versatile enough to work on each others equipment, as has been required at times when we had more GCA and Rapcon work than we had teams. Basically we have one ATC Radar team, and one AC&W team. At times we have augmented both with radio technicians, as during the long nursing of the Phan Rang MPN-ISA and the installation of the FPS-90 height finder at Plieku. Our radar people have repaired and modified RAPCON equipment in Thailand.

Feathers in our cap were won by the MPN-15A at Phan Rang and the FPS-90 at Plieku. Both jobs were plagued for months by contractor problems, at Phan Rang, and by base support delays at Plieku. Although the MPN-15A was new to them. our technicians became experts on the precision radar portion. and once it was turned over to the customer, they stayed on awhile to insure that operating personnel were well indoctrinated and qualified to maintain the equipment. At Pleiku, the FPS-90 installation was smooth from the start to finish, under the able direction of its team chief, SSgt James R. Atwater. It was the kind of job we would like to think is typical, but so seldom is. The team moved in on the heels of the tower construction team, having completed the item inventory in the interim, installed the equipment, checked it out through hot check and operational check, and turned it over to a satisfied customer.

Emergency Work

Repair teams responded to emergency requests six times for TACAN failure, one time each for GCA radio and RAPCON repair. On one of their rare visits out of country, the RAPCON team did its work at UTAPO Thailand.

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Support Division

This division has the responsibility of managing all scheme material required for installation within the Republic of Vietnam, providing support of equipment and supplies type item, and maintains operation and control of vehicles.[1] The following are the type and quantity of vehicles assigned, maintained and operated by this organization this past year.

V 11 Telephone Maintenance Trucks	14 each
Loadstar 1700	6 each
V 17 Maintenance Trucks	8 each
V 18 Maintenance Trucks	3 each
Industrial Tractor	5 each
J 36 Trencher	7 each
Davis 1000 Trencher	6 each
Truck Wrecker	1 each
Truck Metro	1 each
Jeep M151	31 each
Truck Crew Cab	48 each
Truck 10 Ton	3 each
Truck 2 1/2 Ton	4 each
Forklift RT 6000 lbs	3 each
Forklift 15000 lbs	1 each
Forklift 6000 lbs	4 each
Tractor TD 15	1 each
Trailer 1 1/2 Ton	1 each
Trailer 25 Ton	6 each
Trailer Cable	11 each
Trailer 1/4 Ton	15 each
Trailer Chassis	1 each
Trailer Pole	4 each
Earth Auger	1 each

This organization is authorized and has in use over $538,640.00[2] dollars worth of equipment authorization inventory data (EAID) items. This equipment consists of housekeeping type items, test equipment, and special tools. These vital items are required for the GEEIA Installation Teams to perform and accomplish their mission in the Republic of Vietnam.

1. Custodian Authorization Receipt List, dated 16 May 1969
2. Custodian Authorization Receipt List, dated 8 Feb 1969

In June 1968 a physical inventory was conducted and completed of all equipment and vehicles on hand. Due to the mission of this organization of having Installation Teams deployed throughout South Vietnam, this required a physical inventory of twenty-two (22) different locations. Accountability and custody was established on all equipment items and vehicles. This inventory[3] netted the Air Force sixteen thousand dollars ($16,000) worth of equipment that was identified, picked up on accountable records and returned to supply channels.

During October and November 1969, in conjunction with the every day workload receiving, shipping, packing, requisitioning, and record keeping the Support Division was confronted with paving of the outside storage area. Over 500 tons of material were relocated pending paving of the yard. During the same period of time high priority schemes were being supplied. The Ban Me Thout TACAN Project was one of the high priorities.

In January 1969, the shipment of scheme material to sites were evaluated. The placement of storage responsibilities upon all Base Supply accounts[4] throughout South Vietnam was established IAW AFM 67-1. This provides additional control, security and protection for material until required at installation site by the Team Chief.

In March 1969, a change in responsible officers occurred.[5] Captain John D. Flood returned to the CONUS. 1st Lt Jerry M. Hale assumed the role as Chief Support Division.

In April 1969, an accelerated program was initiated to survey, identify, inventory and dispose of the excess scheme material located at each base within the Republic of Vietnam. An estimated $300,000.00 worth of excess cable was located at Nha Trang AB.[6] Forty-four reels of the servicable cable was returned to supply channels to fulfill an urgent requirement within Vietnam. The balance of the cable was turned into the local Base Supply or Redistribution and Marketing activity. The excesses at Phan Rang AB consisted of 29 reels of servicable valuable cable, 13 reels of unserviceable cable and 15 empty steel reels which were disposed of IAW applicable directive.

In May 1969, this activity was faced with the problem of transporting 80,000 pounds of scheme material across the Bay of

3. Inventory List dated July 1969
4. Commander Newsletter from GEPZCS, dated 15 January 1969
5. Commanders Newsletter from GEPZCS, dated 5 March 1969
6. Commanders Newsletter from GEPZCS, dated 5 april 1969

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ADMINISTRATION HISTORY

During the first half of FY 69 manning continued to be a serious problem. At one point the Office of Administration was manned by only one supervisor and one clerk out of a total authorization of six. In December and January we received several clerks which relieved the most pressing shortages. However, from July through March the Electronics Branch had to supply two personnel to operate the Unit Mail Room.

Forecasting manpower resources continues to be a problem, since, in many cases, the CBPO doesn't know a man isn't coming until he actually does not show up as scheduled. Even then they are required to wait until the end of the individual's scheduled arrival month before being able to attemp to trace him down, as a no show. We anticipate similar manning problems in December 1969 and January 1970 when the majority of the clerks now assigned rotate.

During FY 69 Administration picked up responsibility for the Suggestion and Information programs. A total of 27 suggestions were submitted by squadron personnel during the quarter FY '69.[1] The Operations division supported the information program with many news releases, and the Administrative Officer was able to obtain added news releases from many sources.

With the heavy workload at Tan Son Nhut AB, Vietnam, we sent a clerk TDY to that base on a more or less permanent basis. He has taken over much of the routine administrative work at that base, allowing the Team Chiefs to concentrate on scheme work, additionally, he has taken charge of the barracks area and vastly improved their condition through a series of self help projects.

In an effort to boost the Airmen Recognition Program an Airman and NCO of the month program was started. Winners of the monthly awards are automatically considered for the quarterly awards. With the help of the 2876th GEEIA Squadron, we obtained certificates to present to each winner.

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1. Quarterly Suggestion Report for CY 269, RCS: GE-U17

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SAFETY

From 1 July 1968 through 30 June 1969 the [illegible]85th GEEIA Squadron accident experience decreased sharply in comparison to the same period during 1967 to 1968. During the period 30 June 1967 through 30 June 1968 the squadron accident experience cost was $37,242.00 which included one fatality.[1] During this same period from 1968 to 1969 the squadron accident cost was $1,245.00. Almost one thousand dollars of this cost was directly due to two government motor vehicle accidents at the beginning of the fiscal year. One of these accidents resulted in a military disabling injury and the loss of 15 days in the hospital for one man. As a result of this, a comprehensive program on vehicle control was established and the squadron did not experience another motor vehicle accident for the remainder of the fiscal year.[2]

Continual safety inspections of working locations with emphasis on personal equipment was stepped-up to help preclude a rise in on-duty first aid injuries. A significant decrease was noted over the same period of the previous year. Supervisors responsibility toward on-duty as well as off-duty safety was the most meaningful accomplishment of the year. Monthly incentive awards for both the outstanding supervisor and crew individual who contributed most to the safety program was initiated. Incentive awards programs for monthly safety slogans and effective safety briefings were also started. These programs helped in the overall total accomplishment of setting a significantly low cost-per-capita accident experience and in staying well below the President's Mission Safety 70 Goals.

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1. Squadron History 1 January 1968 - 30 June 1968
2. Monthly Ground Accident report. RCS: AF-COI-X2

Training

During the past year the training program has had its problems, as evidenced by our standings in the Pacific GEEIA Region OJT ratings. Then suddenly the program seemed to jell and during the month of April we rose to the top in the rankings.[1] The Training NCO and his assistant, MSgt Charles W. Stith and TSgt Paul P. Seman were largely responsible for the improvement.

They implemented a mobile OJT advisory service traveling to our many teams in the field to give assistance with training problems, inspect training records and check on the progress of trainees. No longer was there an attitude that this is a war zone so training can be dispensed with.

Excessive training and personel eligible but not in training rates all fell sharply. In addition, during the last three months of the fiscal year, approximately 38% of all personnel in training were upgraded.[2] Primarily this is due to the squadron's OJT Council. Consisting of the Operations Officer as chairman, plus the Training Officer, Training NCO and senior NCOs from the branches, the council reviews individual cases of testing failures and lack of training progress. It then recommends a course of action to correct these deficiencies. Often it may recommend the individual be brought in to Cam Ranh Bay for intensive study. Additionally, with the doing away of the SKT as a criteria for upgrading, the OJT Council studied the records and results of those trainees eligible for upgrade and recommended those it felt were qualified for upgrading.

With the close of the fiscal year, the training program is definitely on the upswing. We look forward to the new Weighted Airmen Promotion System (WAPS). Extensive preparations for this new system have already been made, from making personnel aware of the ramifications of the program, to obtaining needed study materials for WAPS testing.

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1. Pacific GEEIA Region Management Performance System January 1969 - May 1969.
2. Monthly OJT Progression Report RCS: GEP-T1 January 1969 - June 1969.

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QUALITY CONTROL

On 1 January 1969 Quality Control became Quality Assurance.[1] The section was expanded to five personnel with representation from crypto, Radio Inside Plant, Outside Plant and Weather. The overall functional responsibility was expanded[2] to encompass inspection of Training Records, vehicles, moral, living quarters and technical workmanship. On 1 April 1969 a New GEEIA Quality Assurance Program was established with the Publication of GEEIAM 74-1. Under this new Program Quality Assurance[3] inspects inspects publications, engineered scheme, deficiency reports, test procedures, corrosion control and workmanship.

1. VOCO Lt. Col. Osborne
2. VOCO Lt. Col. Osborne
3. GEEIAM 74-1, Chap 3.

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Key Personnel Changes

Since the tour of duty in Vietnam is only one year, the fiscal year sees an almost complete turnover of personnel. Starting with Lt Col George S. Osborne taking over command of the squadron from Lt Col James W. Galloway, key new personnel during the year were:

Lt Col George S. Osborne	Commander	November
Major David B. Cowan	Operations Officer	July
Major James W. Cowan	Operations Officer	April
Capt Stephen A. Costello	Project Officer	October
Capt Jerry W. Hale	Support OIC	February
Capt Larry Harrell	Electronics OIC	April
Capt George W. Pickard	Wire OIC and Proj Off	September
Capt Earl J. Scalet	Electronics OIC & Proj Off	August
1st Lt Charles E. Denonn	Project Officer	April
1st Lt Wayne H. Fisher	Project Officer	July
1st Lt Jerry W. Johnson	Wire OIC	February
1st Lt Robert C. Sawyer	Administrative Officer	November
1st Lt Jerry W. Sparks	Electrical Engineer	April
CMSgt Francis F. Coker	Project Officer	July
CMSgt Paul Tokar	Project Officer	January
SMSgt David L. Brown	NCOIC Wire Branch	December
SMSgt William Sidwell	NCOIC Workload Control	March
SMSgt Vincent L. McCarthy	NCOIC Elect. Branch	February
MSgt Milton T. Bell	Circuite Rider	December
MSgt James E. Brown	Project Office	December
MSgt Robert L. Burgess	NCOIC Construction	November
MSgt Robert P. Carey	Cable Splicer Supervisor	August
MSgt Ivan E. Dennis	Team Chief	August
MSgt Gerald F. Kavanaugh	Chief O.A. Team	March
MSgt Joseph C. Glendan	Crypto Superintendent	December
MSgt Robert D. Nelson	Supe Radio/Navaids	October
MSgt Mauri B. Stephenson	O.A. Team	December
MSgt Charles W. Stith	Training NCO	December
MSgt William E. Tinker	Team Chief	May
MSgt Chester R. Tucker	Inside Plant NCOIC	August
MSgt Alton O. Uttech	Inside Plant Supe	November
MSgt James F. Hall	NCOIC Supply	July

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1. Pacific GEEIA Region Management Performance System
   July 1968 - May 1969

2. Commander's Monthly Newsletter
   August 1968 - May 1969

3. Monthly Ground Accident Report, RCS: AF-[illegible]
   July 1968 - June 1969

4. Monthly OJT Progression Report, RCS: GEP-T1
   January 1969 - June 1969

5. Squadron History of the 485th GEEIA Squadron
   1 January 1968 - 30 June 1968

6. Custodian Authorization Receipt List
   8 February 1969, 16 May 1969

UNIT HISTORY

2875 GROUND ELECTRONICS ENGINEERING INSTALLATION AGENCY SQUADRON
TACHIKAWA AIR BASE, JAPAN

Fiscal Year 1969

PREPARED BY:

JOHN S. SMITH, Lt Col, USAF
Commander

PHILIP R. BROWN, IV, Capt, USAF
Unit Historian

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ORGANIZATIONAL CHART
OPERATIONS
2075TH GEEIA SQUADRON

30 JUNE 1969

MISSION: To accomplish the programmed installation and Mobile Depot Maintenance of USAF Ground CEM equipment within the assigned area of responsibility, accomplish the directed in-house workload in support of PACAF as directed by the IM/SSM, provide installation and maintenance support to all MAP countries as programmed by AFR 400-2, provide emergency technical/consulting service to the CEM users within PACAF area of responsibility, and fabricate FPN-16 panels.

COMMANDER
2075TH GEEIA SQUADRON
GEPZA

OPERATIONS BRANCH 1
GEPZA-O

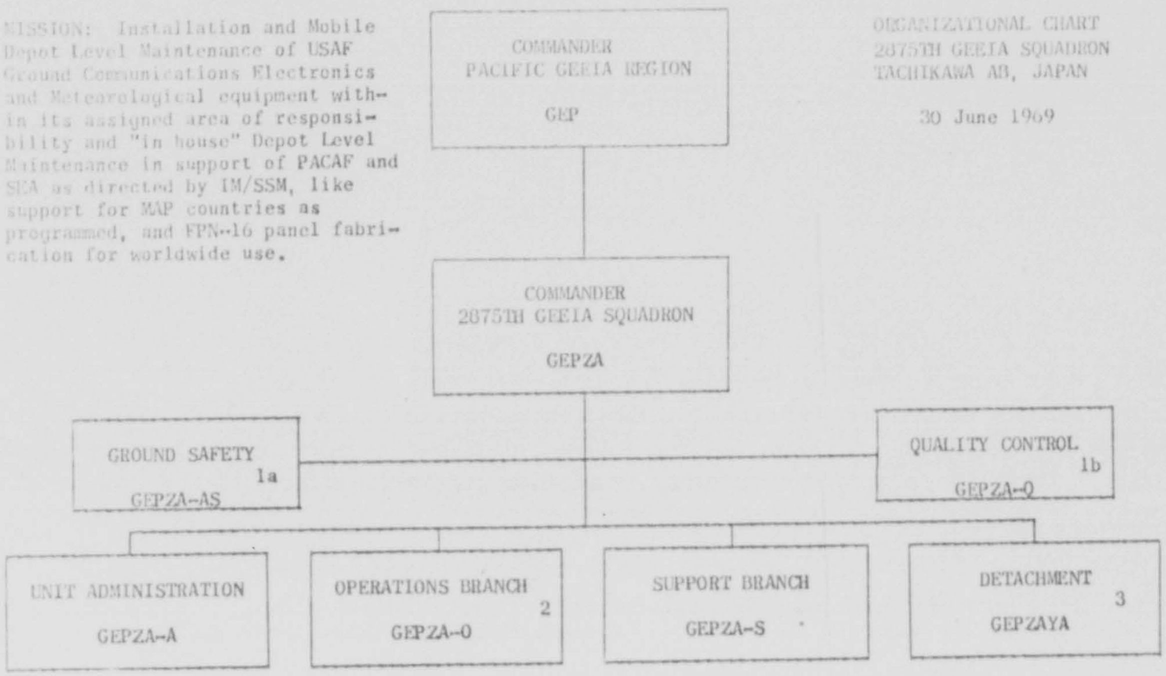
- WIRE — GEPZA-OW
  - INSIDE PLANT — GEPZA-OWA
  - OUTSIDE PLANT — GEPZA-OWB
- ELECTRONICS — GEPZA-OE
  - RADIO — GEPZA-OEA
  - RADAR — GEPZA-OEB
  - FLIGHT FACILITIES — GEPZA-OEC
  - FPN-16 PANEL FABRICATION
  - CORROSION CONTROL — GEPZA-OEE
- TRAINING — GEPZA-OT
- WORKLOAD CONTROL 2 — GEPZA-OC
  - PRODUCTION CONTROL — GEPZA-OCA
  - STANDARDIZATION & ANALYSIS — GEPZA-OCB

Note:
1. Echelon designations below branch are being delayed pending GEEIA supplementation of AFLCR 23-17.
2. Due to an inadequate manning authorization this branch has had utilize personnel from other work center to complete its mission.

ORGANIZATIONAL CHART
2875TH GEEIA SQUADRON
TACHIKAWA AB, JAPAN

30 June 1969

MISSION: Installation and Mobile Depot Level Maintenance of USAF Ground Communications Electronics and Meteorological equipment within its assigned area of responsibility and "in house" Depot Level Maintenance in support of PACAF and SEA as directed by IM/SSM, like support for MAP countries as programmed, and FPN-16 panel fabrication for worldwide use.



1a & 1b. Formerly under Unit Administration and Operations Branch, respectively.
2. See Chart IB
3. Located at Kadena AB, Okinawa

1 UNIT STRUCTURE

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Civilian Disabling Injuries	0
Civilian Fatalities	0
GMV	2

Accident Costs

Military Non Disabling Injuries	336
Military Off Duty Disabling	2,800
GMV Damage	0
Other Property Damage	596
Military on Duty Disabling	1,500
Total	5,232

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II PERSONNEL AND SPECIAL INFORMATION

PERSONNEL INFORMATION

Personnel Strength (last day of reporting period):[1]

	OFFICERS	AIRMEN	USCE	JN	TOTAL
Authorized	9	394	19	169	591
Assigned	8	374	17	168	567

Awards and Decorations:[2]

The Air Force Commendation Medal was awarded to the following personnel for Meritorious Service during this period:

MSgt Renick McGuire, AF12468130

MSgt Richard A. Jolley, AF19552152

TSgt George A. Inklebarger, AF2543132

SSgt William L. Schaul, AF17566595

SSgt Arlie H. Steinmetz, AF13270629

Promotion:[3]

During this period the following promotions were effected:

E-8 - 2
E-7 - 4
E-6 - 12
E-5 - 19
E-4 - 111
E-3 - 10
E-2 - 0

ORGANIZATIONAL CHANGES - Colonel Joseph A. Savuto was Commander during the first eight months of this FY and Lt Colonel John S. Smith was

1. Based on our 30 June 1969 Morning Report.
2. Documented in official records.
3. Copies of orders are on file at this unit.

Commander during the remainder of the reporting period. TSgt William A. Green was First Sergeant during the first six months of this reporting period. MSgt Billy D. Kenner was First Sergeant during the remainder of the period. During the reporting period the following officers joined the Squadron: Lt Col John S. Smith, Commander, from Hq GEEIA, Griffiss AFB, NY; Maj Carlos D. Harlow, Chief, Operations Branch, from 2862 GEEIA Sq, Patrick AFB, Fla; Capt Garland W. Benfield, Chief, Wire, from Hq GEEIA, Griffiss AFB, NY; Capt Michael E. Schmid, Chief, Flight Facilities, from Alaska Air Command; Capt Gary L. Peck, Chief, Support Branch, from 2728 Air Munitions Sq, Hill AFB, Utah. The following officers departed during the year: Col Savuto, Central GEEIA Rgn; Lt Col Berryman, 834 AD, APO 96307; Maj Hornyak, Hq AF Easter Test Range (AFSC), Patrick AFB, Fla; Capt Aho, 2867 GEEIA Sq, McClellan AFB, Calif; Capt Lorenzen, separation; Capt Brown, Greensboro, NC, ROTC Instructor Duty.

GROUND SAFETY

Below are the Ground Safety Office statistics for the year:[4]

Ground Accident Summary

Military Non Disabling Injuries	24
Military On Duty Disabling Injuries	1
Military Off Duty Disabling Injuries	4
Military Fatalities	0
PMV	1
Civilian Non Disabling Injuries	0

- - - - -

4. Figures based on RCS-AF-CD1-X2, Ground Accident Summary and Safety Office records for the reporting period.

III PRIMARY MISSION DATA

ELECTRONICS - The Electronics Section of the Operation Branch (Chart IB) is composed of five units: Radio, Radar, Flight Facilities, Corrosion Control and FPN-16 Panel Buildup. The Electronics Section performs on-site depot level maintenance surveys, depot level on-site maintenance, installations, and off-site maintenance of all ground C-E-M equipment. Additional services provided include emergency technical assistance and technical consulting services for USAF and other operating organizations.

AC&W Radar:

The Search Radar and Height Radar Units comprising the AC&W Radar Section were fully workloaded with scheduled on-site IRAN's, installations and modification schemes, emergency assists, and in-shop maintenance. Three scheme actions were completed during this fiscal year. The Radar accomplished nineteen emergency maintenance assists during fiscal year 1969. Most of these were of major proportions involving technical problems or restoration efforts that were beyond organizational capabilities. Three of the emergency jobs were is Southeast Asia and in most cases required restoration in the shortest possible time. These jobs usually involved antenna failure or complete system deterioration due to excessive operational demands on the equipment. There were one hundred one routine maintenance assists during the year. Major items completed in shop included three each AN/MPS-11 Search Radar Sets and one each AN/UPS-1 and no AN/FPS-6 Height Radars were completed. There were fourty-seven pre-IRANS, thirty-four of which were in SEA, and nineteen IRANs, ten of which were in SEA.

Flight Facilities:

Flight Facilities is comprised of four work centers: Ground Controlled Approach (GCA) Radar, Navigational Aids, Meteorological Unit and Air Conditioning. These work centers perform on-site and Inventory Manager directed in-shop depot level maintenance and installation of GCA, Nav-Aids and meteorological equipment. These work centers also provide emergency maintenance assistance, technical consultation assistance, relocation and removal capabilities of respective equipments. The GCA Radar Unit was confronted with a continually heavy workload during fiscal year 1969. To meet its commitments it was necessary to obtain augmentation from CONUS GEEIA squadrons. During the peak months of January 1969 through March 1969 as many as twenty augmentee personnel where employed by the work center. Under the Inventory Manager-directed Mobile GCA/RAPCON IRAN program, nine radar systems were overhauled in-shop. This included AN/MPN-14, SN 108 completed in August 1968 AN/CPN-4, SN 9, in September 1968, AN/FPN-16, SN 72, in October 1968, AN/MPN-14B, SN 161, in February 1969, AN/MPN-13, SN 14, in March 1969, AN/FPN-16, SN 37, in April 1969, AN/MPN-13, SN 587, in May 1969, AN/MPN-13, SN 117, in June 1969, and AN/MPN-13, SN 143, in July 1968. Of the nine systems, one system was returned to the CONUS and the remainder were installed in-theater by teams from the work center. On-site teams from the work center installed or relocated six mobile RAPCON systems, performed seventeen Pre-DLM surveys, a like number of follow-on DLMs and responded to twenty requests for emergency maintenance assistance.

The three - man Air Conditioning Unit supports the in-shop Mobile GCA/RAPCON IRAN program by overhauling systems removed from the vanized radars. Towards this end, eleven overhauls were completed during the fiscal year. Additionally, one emergency air conditioner exchange was performed on-site.

The Navigational Aids Unit performed a wide variety of depot level tasks including on-site maintenance, both emergency and scheduled, installations and in-shop overhaul of TACAN antennas. Seventeen Hi-Band and fourteen Low-Band TACAN antennas were overhauled during the year. These antennas were used to support TACAN facilities in the Pacific area. On-site workload consisted of scheduled depot overhaul of eleven facilities. Thirteen emergency TACAN antenna changes were accomplished during the year. The section also responded to eighteen requests for technical assistance on TACAN equipment.

Radio Section:

Installation of ground electronic equipment was the main workload of the Ground Radio and Radio Relay work centers during this fiscal year. The in-shop maintenance effort was limited to Security Service equipment

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and the continuing AN/SLR-2A Countermeasures overhaul program. The Radio unit is comprised of two sub-units, Ground Radio and the Microwave Radio relay shop. During FY69, fourty installation schemes were completed plus eleven obsolete equipment removals. In addition to this, numerous Pre-Iran surveys, emergency maintenance assist and on-site pre-installation surveys were performed, also approximately thirty-five augmentees were furnished Det 2 and Pac GEEIA Rgn.

WIRE SECTION - This section is composed of two major activities, Outside Plant and Inside Plant. The primary mission of the Wire Section is the installation, removal and relocation of ground communications equipment in the Outside Plant, Cable Splicing, Inside Plant and Cryptographic categories. The section also performs on-site depot level surveys and maintenance. Emergency installation and restoration jobs were accomplished throughout Japan, Korea, the Ryukyu Islands, and several removal and installation projects on teletype, crypto and telephone equipment were completed in Japan and Korea to update and modernize the existing facilities. Major projects not treated elsewhere were:

Scope Control - Re-designated code name for Prescilla Ellen. Although this project was completed in 1967, the AN/FRA-88 antenna (Trylon) were continual problems, due to design, for proper rotation. Complete change out of the three (3) gear mechanisms of the antennas solved the never ending problems. These antennas, located at the Kashiwa Transmitter Site, Japan, were the first of their type to be placed in complete satisfactory operation.

QUALITY ASSURANCE - During FY 69 the Quality Assurance Inspection Office continued to implement the Quality Assurance Plan as outlined in AFLCM 74-2 and GEEIAM 74-1. A total of 2,893 quality inspections on CEM equipment were performed. A .02 defect percentage was average. Quality Assurance surveillance was maintained on equipment undergoing repair and/or manufacture at the U.S. Army Signal Depot shops at Sagamihara, Japan, and the 6100 Support Wing Vehicle Maintenance Shops at Tachikawa AB, Japan. Numerous activity inspections were performed by personnel of the Quality Assurance Inspection Office. The subjects of these inspections were housekeeping, safety, supply warehousing and general process and procedures. Results of these inspections were presented to the Commander and actions were taken to correct all discrepancies. The Quality Assurance Inspection Office provided direct support to the Squadron's Zero Defects/Cost Reduction Program by maintaining continuous emphasis on all objectives until 14 May 1969 when the Cost Reduction Program was realigned under the Chief, Support Branch. New ideas and improved methods were incorporated to sustain the program. Six hundred and twenty-one Zero Defects Certificates were presented to persons in recognition of their commendable contribution to the Zero Defects Program. Three hundred and seventy-four Cause and Removal of Error forms were processed. The Squadron's Cost Reduction Program reported realized savings totalling $4,300.00 validated by the local base auditor. Personnel of the Quality Assurance Inspection Office conducted six Corrosion Control inspections at operational job sites. Deficiencies were reported and corrective action was taken. The Technical Order

Library Branch of the Quality Control Office maintains and updates approximately 20,000 T.O.s. The T.O. Library also controls the issue of all GEEIA team chief handbooks.

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WORKLOAD CONTROL SECTION - This section is also divided into 2 activities: Production Control and Analysis and Standardization. Major Myer Kuritzky is Chief, Workload Control Section.

Production Control:

During this reporting period the Production Control Section operated with separate Maintenance and Installation Units. This provided more effective management of maintenance and installation workload due to the separate and distinct peculiarities of each type of work. The Workload Control office and also that of Production Control were relocated from their prior location upstairs in Bldg #1257 to the Office Area previously occupied by Wire Section and the Squadron Administration Officer. The Command Control Room was also relocated from the upstairs area to the downstairs Commander's Conference Room. This relocation enables Workload Control personnel and the Command Control Charts to be readily available to the Squadron Commander and the Operations Officer. This move was completed by the end of May 1969. The Telex machine installed by direction of Hq GEEIA on 12 November 1968 was relocated from the old Command Control Room (upstairs) to a new location outside of Squadron 1st Sgt's Office, permitting the Squadron Commander and Operations Officer ready access to this facility. Briefings are conducted by Production Control personnel for the Commander and his staff on Tuesday and Thursday of each week. These briefings cover all work-in-progress, status, problem areas and a 60 day forecast of future work. This includes both in-house and on-site workload.

Analysis and Standardization:

S-56 FPN-16 Project: When the requirement to furnish FPN-16 Panels for World Wide usage was levied upon the Squadron Detailed Drawings were not available from the Contractor who originally produced the FPN-16 Vans. Our Drafting unit was charged with producing drawings in volume. Twenty-four different panels were included in the requirement.
A complete Van Body was dismantled and each panel had to be disassembled in order to get accurate dimensions of the interior construction. Master drawings were then prepared giving all detail and dimensions in order that fabrication of panels could proceed. To date we have furnished the prime A.M.A. with 770 Blue Prints and 308 Sepias.

Key Punch: Due to the overloaded condition at the 6100th Data Automation Branch we were informed that they could not longer perform key punch service for this squadron. As a result of a factual study performed we were able to justify a key punch machine and were very fortunate in securing an experienced operator. By the time Pacific GEEIA Region requested us to attempt to secure a key punch we already had one setup and working in OCB. As a very welcome by-product our "key punch error rate" has been reduced to almost Zero.

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IV UNUSUAL JOBS AND PROJECTS

ROCK-TOP/TOP LEVEL - This project lasted 3 years and involved numerous personnel of both the Electronics and Wire. This upgrade of Korean Perimeter and AC&W Sites involved 8 sites extending from Paengnyong-Do on the northwest and Kang Nung on the northeast to Cheju-Do at the southern most point of Korea. Our last scheme one this project was a GPS-4 dualization at Cheju-do which was cleared on 29 Nov 1968.

FPN-16 PANELS - The month of July 1968 added a milestone in the mission of the 2875th GEEIA Squadron. Because of the difficulty being experienced by OCAMA in obtaining panels for AN/FPN-16 equipments, we were tasked by the Commander of GEEIA to determine if we could expand our present AN/FPN-16 panel repair capability to a complete fabrication of these panels. We determined that with some off-shore procurement from the Japanese industry for aluminum extrusions and an expansion of 4 personnel in our organic capability that we could do so and at a cheaper price than they could be produced for in the United States. Our proposal for manufacture of these panels was approved by both the Commander of GEEIA and OCAMA.

V MISSION SUPPORT ACTIVITIES

SUPPORT BRANCH. Capt George L. Lorenzen was OIC of Support Branch through 27 May 1969. Capt G. L. Peck arrived in June 1969 to assume duty as OIC, Support Branch. MSgt F. J. Yuchnitz is the new NCOIC of Support. Because of personnel (7 level) departures MSgt Trent was assigned Tool Crib NCOIC and TSgt Brown assumed Material Management Section. Sgt Ellman and A1C Miles are in training as scheme managers. SSgt Noxon reported for duty in Research Section. During the period 1 January through 30 June 1969 the warehouse received 6,837 line items weighing a total of 2,098,816 pounds and shipped 1,079 pieces with a total weight of 1,035,754 pounds. We are storing 109 schemes. During this period a total of 11,538 items were researched and $36,851.62 in bench stock items were issued to the shops. The bench stock through management action was reduced from 1326 line items to 1195 items. Net value of the vehicles on hand is $580,542.26. The 163TC account is valued at $302,930.29 in use versus $384,322.11 authorized. Approximately $30,524.00 in support tools. Procedure for "G" accounting was approved and will commence 1 July 1969.

VI ADDITIONAL INFORMATION

WORKLOAD AND MISSION. A total of 187 schemes were completed in FY 69. This does not include those done by our Detachment 2. 74 IRANs were completed during the same period and 117 emergency maintenance jobs were accomplished during that period. Detachment 2 completed a total of 132 schemes during the past year. During the restoration after Typhoon Della, the detachment was responsible for restoring all outside plant facilities which included the replacement of four Radomes and four Antenna forms. Communication capability was restored one day after the typhoon. The detachment was involved with the expansion of both central telephone offices at Kadena and Naha where the existing 3,800 protectors were replaced with 3,800 protectors. All major telephone feeder cables at Kadena and Naha are being replaced and an AN/FPS-77 was installed at Kadena. The detachment used more than 200 Air National Guard augmentees during the past year and has maintained an augmentee level between fifty and 120 people at all times.

COMMUNITY RELATIONS. During this period several Unit personnel were engaged in English language and Cultural exchange groups. During September and November 1968, 7 members of the unit acted as judges for the 19th Intercollegiate English Debating Contest in Tokyo, Japan and for the Intercollegiate English Debate at Musashi Institute of Technology. In April the squadron was host to 7 members of Tachihi Enterprise (Tachikawa City, Tokyo, Japan). They toured the squadron

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on an Orientation and Familiarization visit to visually check the work of hired Japanese employees. The building and ground area presently occupied by the squadron is owned by Tachihi Enterprise.

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ANNUAL HISTORICAL REPORT

1. NAME OF UNIT — 2876th GEEIA Squadron

2. LOCATION: Clark AB, Republic of P.I.

3. FROM: 1 July 68 THRU: 30 Jun 69

4. NAME AND LOCATION OF NEXT HIGHER HEADQUARTERS:

Pacific GEEIA Region
Wheeler AFB, Hawaii

5. PERSONNEL STRENGTH:

	Officers	Airmen	Civilians	Total
Authorized	7	240	24	271
Assigned	3	219	23	250
Attached	0	0	0	6

6. STATEMENT OF MISSION AND CHANGES:

The mission of the 2876th GEEIA Squadron is to install and maintain ground electronics equipment according to installation standards and specifications furnished by higher echelons, and to perform such other installations, removals or modifications as directed by higher headquarters.

This work is accomplished in support of Pacific GEEIA Region.

7. ADMINISTRATION:

The Squadron Administration Office has effectively supported the operation of the squadron. During the Annual General Inspection by Headquarters GEEIA, this section was rated as satisfactory. A check of TDY orders indicated that an intensive review was made of all requests for travel orders to insure maximum use of government facilities.

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The Administrative Officer was given the additional duty responsibilities of the (1) Zero Defects Program, (2) Military Suggestion Program, (3) Safety Program, and (4) Career Motivation.

The Zero Defects Program greatly improved during this fiscal year. A total of two hundred and seventy-six (276) CARE Forms were submitted with one hundred and twenty-four (124) accepted, ninety-nine (99) not accepted, and a total of fifty-three (53) still pending. The awards program also showed an increase in participation. A total of one hundred and sixty-three (163)awards were presented, one hundred and nineteen (119) bronze awards and forty-four (44) silver awards. Further emphasis was placed on the higher awards which resulted in eighteen (18) awards pending, seven (7) gold awards and eleven (11) silver awards.

The Military Suggestion Program received greater support during the last year than any previous year. A total of ninety-three (93) suggestions were submitted, eighty-six (86) by military and seven (7) by civilians. Our average assigned strength was two hundred and twenty-eight (228) military and twenty-three (23) civilians.

B. AWARDS AND RECOGNITIONS:

The following individual honors were won by personnel of this organization:

Airman's Medal:

Sgt William L Holsten

Air Force Commendation Medal:

SMSgt Clayton E Dilts

MSgt Lawrence J Westbrook

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TSgt Homer C Wooten

TSgt Willis L Stacks

SSgt Zina L Carr

Pacific GEEIA Region Airman of the Year:

A1C Larry R Campbell

Pacific GEEIA Region Airman of the Quarter:

A1C Brian D Kassel

A1C Thomas E Rivers

Pacific GEEIA Region NCO of the Quarter:

TSgt Charles D Herrington

Republic of the Philippines Presidential Humanitarian Award:

A1C Herbert L Perry

The squadron received the Pacific GEEIA Region Outstanding Safety Performance Award and the Pacific GEEIA Region Zero Defects Awards for the last six months of CY-68.

9. PERSONNEL:

SMSgt Charles E Chapman (30471), departed for the 4627th Spt Sq., Custer AF Sq., Minnesota in July 1968.

Captain Richard L Cox (3034) departed for Hq GEEIA, Griffiss AFB, New York in September 1968.

SMSgt Paul R Green (36194) departed for the 2865th GEEIA Squadron, Chanute AFB, Illinois in October 1968.

SMSgt George O Field (36174) left for Det 31, 2867th GEEIA Squadron, Vandenberg AFB, California in October 1968.

CMSgt James Bresci (30490) departed for the 3rd MOB Comm Gp, Tinker AFB, Oklahoma in February 1969.

Captain Vernon F Steele (6424) replaced Capt Chase as Squadron Supply Officer in February 1969.

2nd Lt Larry D Pollock (3041) arrived in March 1969 and assumed the duties of Squadron OIC, Electronics Branch.

Capt Richard W Chase (6424) departed for the 56th Supply Squadron, APO SF 96310.

SMSgt Calvin F Dodez (30490) arrived in June 1969 and assumed the duties of NCOIC of the Electronics Branch.

SMSgt Emmett D Tillett (30490) arrived in June 1969 and assumed the duties of Chief of the Workload Control Branch.

10. PROMOTIONS:

2nd Lt Ladd A prier was promoted to the rank of 1st Lieutenant on 4 July 1968.

1st Lt William Fruean was promoted to the rank of Captain on 10 February 1969.

1st Lt Vernon F Steele was promoted to the rank of Captain on 30 March 1969.

MSgt Ernest W Wingate was promoted to the rank of SMSgt on 1 July 1969.

11. FINANCE:

Funds obligated for TDY travel during Fiscal Year 1969 totaled $172,823 (see attachment #1).

12. TRAVEL COORDINATING AGENCY:

The Squadron TCA published four hundred and forty-two (442) special orders directing temporary duty. Three hundred and six (306) amendments were also published. Modes of transportation were entirely by government vehicle or government plans.

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13. SAFETY:

"Safety through Supervision" was continuously stressed in an agressively conducted safety program during FY 1969. The efforts from 1 July 1968 through 31 December resulted in our unit receiving the Pacific CEEIA Outstanding Safety Performance Award for the last six months of CY-1968. There were no reportable accidents, and only two non-reportable government motor vehicle accidents with the estimated cost of damages at $19.50. The last military reportable accident was experienced on 7 May 1968. The civilian accident/incident record continues to be commendable with the last disabling injury ocurring on 8 March 1961.

14. SUPPORT DIVISION:

A re-inventory and identification of 9300 stock at Dau Warehouse has been completed which resulted in the disposition and disposal of over one hundred (100) reels of excess cable and approximately $10,000 of associated construction hardware. The review additionally enabled the establishment of a comprehensive audit trail, wherein every receipt, diversion and issue is documented. As a result, constant surveillance is possible on daily inventory balances.

The management of dangerous and flammable material storage and handling was closely reviewed. As a direct result, many unsafe conditions were noted and corrective actions promptly taken. Coordination has been effected with the Base Civil Engineer for the construction of an improved flammable storage facility.

Vehicles are more reaily available to meet mission requirements due to an intensified study and re-distribution of vehicles assigned. Increased

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efforts to improve the physical condition of the vehicle inventory have been fruitfull in the area of corrosion control. Because of close surveillance and timely processing, mechanical, and safety discrepancies have been markedly reduced. The additional fifteen (15) new vehicles also improved the overall quality of the squadron's vehicle inventory.

Improved management and intensified efforts towards positive supply response have resulted in the creation of a very favorable trend. At the beginning of this period, approximately 14 FSDs were slipped each month for reasons directly related to material shortages. Currently, this figure has been reduced to zero. No FSD slippages are due material shortages at this time. Supply responsiveness has improved in such a manner that we have an average of one material requirement for all in-progress schemes. This figure used to be between eighteen and twenty at all times. This means that team chiefs are getting prompt and accurate response to in-progress material requirements and that costly work stoppage conditions due to material have been eliminated.

A complete review of supply and equipment requirements was conducted within the tool crib. Realistic authorizations were established for all supplies, tools, and test equipments. This intensified managerial action has resulted in an inventory decrease of approximately $92,000 and improved the capability of responding to mission requirements. With the publication of a cross-reference catalog, identification of required tools and test equipment was greatly facilitated.

A large amount of progress has been made in improving both personal protective equipment available to operations personnel and procedures

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controlling the issue and storage of dangerous items. The tool crib facility was completely inventoried and re-warehoused, resulting in vastly improved protection and control of government property.

The security afforded government property in the supply area measurably improved. The establishment of the following controls reduced the possibility of loss, and made rapid identification of nay pilferage possible.

(1) Material storage areas are limited access to only designated supply personnel.

(2) Daily inventories are conducted of all high-value assets.

(3) Imroved Air Police protection has been obtained.

(4) Every issue from each material storage location is specifically authorized, recorded, and controlled.

15. OPERATIONS DIVISION:

This division has successfully completed 250 schemes and work orders during FY '69. By far, the largest percentage of these schemes were completed on or ahead of schedule. Of the few that were delinquent, all but one or two were delayed by engineering or material problems rather than errors by the installation personnel.

Some high points of interest in this workload have been emergency installation of three communication centers, the installation of two dial central offices, and the unique erection of a radar tower. The communication centers, two located in Taiwan and one in the Philippines, were all done under priority conditions, installed full compliments of the latest comsec equipment, and totaled more than 65,000 manhours. The dial central offices were unusual because one started as a comparatively simple 400-line extension and ended up as a 200-line removal and 600-line initial installation, while the second started under very adverse conditions, the equipment having been installed elsewhere but inoperative for a long period and consequently requiring extensive DLM, yet the scheme turned out to be a model installation. The radar tower was an FPS-77 weather radar installation at CCK Air Base in Taiwan. The method of erection of the 95-foot tower was unique in that it was assembled vertically in place, piece by piece. This was done because no crane that was tall enough was available. The normal procedure is to bolt the tower together on the ground and hoist it into place. The commodities that have been heavily tasked have been the C, K, B, and A commodities. Yet these sections have experienced the greatest manning problems. These problems consist of a very high percentage (80%) of 3-levels coming in as replacements for 5 and 7 level personnel. This process, throughout this period, has placed, at times, an unrealistically heavy burden on the remaining experienced people, both as to their direct performance and training responsibilities.

The authorized and assigned strength at the end of FY '69:

AFSC	Authorized	Assigned
3016	2	2
3034	2	2
3044	1	2
303X1	3	3
304X0	15	17
304X1	18	12
304X4	37	32
306X0	9	11
361X0	52	41
361X4	37	37
362X1	26	24
363X0	17	16
Total	219	199

The number of schemes and work orders completed in FY '69:

Commodity	Number
A	34
B	53
C	10
H	1
J	2
K	45
M	15
N	30
Q	0
R	35
S	15
V	0
W	3
X	6
Total	250

15. WORKLOAD CONTROL:

Fiscal year 1969 has seen extensive changes and improvements in all aspects of workload control. These improvements can be grouped into three general areas: data display and other methods for dissemination of information; data analysis and reporting; and refinement of procedural directives.

The key item in the data display area is the new display board which was completed in November. The board is constructed of plywood and plexiglass and is lighted with flourescent tubes. The panels have been slanted to reduce glare, making the colored grease pencil lettering, which glows under the flourescent light, very easily legible. The board displays all in-progress schemes with associated data, three months worth of programmed schemes, scheme support status, horserace data, manpower figures, Irans, and schemes signed with exceptions. The proximity of all this information, all the installation of a podium equipped with a P.A. system, greatly facilitates

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briefing of the staff in the latest developments. As a result, a more effective briefing schedule was established. Work load contollers give a briefing on the programmed workload on Mondays, while the branch OIC's or NCOIC's give an in-progress workload briefing daily except on Fridays when the heads of the individual sections give a detailed briefing on their schemes. Another improvement which has aided the flow of information was the installation of a RCA Telex machine. This device makes possible very rapid message transmission. During this period, a new analysis section was created. It is the responsibility of this section to monitor and analyze data submissions, in order to detect errors and recommend changes that will make the systems more efficient. The programs with which this section deals are the "Horserace" and manhour accounting. Personnel in this section have made every effort to clarify the procedures in these systems. The over-all result has been a tremendously improved squadron statistical picture, one that more closely represents the actual things being accomplished.

Following the implementation of CEEIAM 100-8 throughout the squadron, in September 1968, several squadron regulations and a 100-8 supplement were published that dealt primarily with workload control procedures. Such a comprehensive publication has been needed for a considerable period. Workload control is the branch where many diverse operational functions coincide, such as staff-level monitoring of workload, monitoring of additional material requirements, reporting, both from the field and to higher headquarters, etc. With such a wide range of functions, workload control procedures need to be explicitly laid out in a consolidated document. This has been done and the result has been a much less confused operation. The new squadron supplement was taught in the Team Chief's school, and several people who attended this class have subsequently become controllers.

The results of the IG inspection were highly favorable with only two memoranda noted. There were no major items or repeats given.

General Nichols, during his March visit, expressed approval of the presentation and the manner in which Workload Control operated.

16. TRAINING:

The Training Section has shown vast improvement during this period. The number of people on excessive training was reduced from a montnly average of nine down to one. A CDC library was organized so as to assist new trainees. It is now possible for new trainees to study their CDC material prior to the receipt of their personal copy. This alone cut the OJT training period by one month.

In an effort to educate all team chiefs and potential team chiefs in general military subjects, as well as in areas unique to GEEIA training section organized a Squadron Team Chief's School. Items covered range from GEEIA publications and forms to the Zero Defects Program and ground safety.

To maintain tighter controls over the OJT program, training charts were initiated, which show the current progression of all trainees. This system has helped a great deal in identifying training problems quickly.

When the SKT was eliminated as a requirement for up-grading trainees, new methods had to be introduced into the training program. Tests were produced by supervisory personnel, which clearly measure a trainee's knowledge and abilities. In conjunction with this, a Squadron Classification Board was formed. The function being, to make decisions in regards to personnel having training difficulties.

This section received an outstanding rating from the HQ CSGIA Inspector General Team.

17. QUALITY CONTROL:

The Quality Control Branch of the squadron was re-organized 1 Aug 68. Personnel assigned to the section at that time were one Senior Master Sergeant, two Staff Sergeants, and one Sergeant. A tremendous amount of emphasis was placed on the value of an active Quality Control program to the mission of the organization. General and specific equipment checklists were developed so that more detailed guidelines could be utilized during the inspection period of Communications-Electronics projects. During this time, some 250 Communications-Electronics projects were completed by the squadron. Of this total, 75% received a formal Quality Control inspection, either during the in-progress or the completion phase. The results of these inspections assisted the squadron in presenting products of a higher quality to its customers throughout Guam, Taiwan, and the Philippines. Customer satisfaction was greatly improved as a result of these efforts.

Assistance visits were made to the Support Division on a monthly basis, to assist in the improvement of tools, test equipment, vehicles and material being supplied to mission personnel. As a result of these visits, better conditioned resources were made available to mission personnel, as was obvious during field trips. Corrosion Control was a matter of prime interest at the time of all inspections and was relentlessly pursued at all times.

The Annual Inspector General's visit in January 1969 resulted in the

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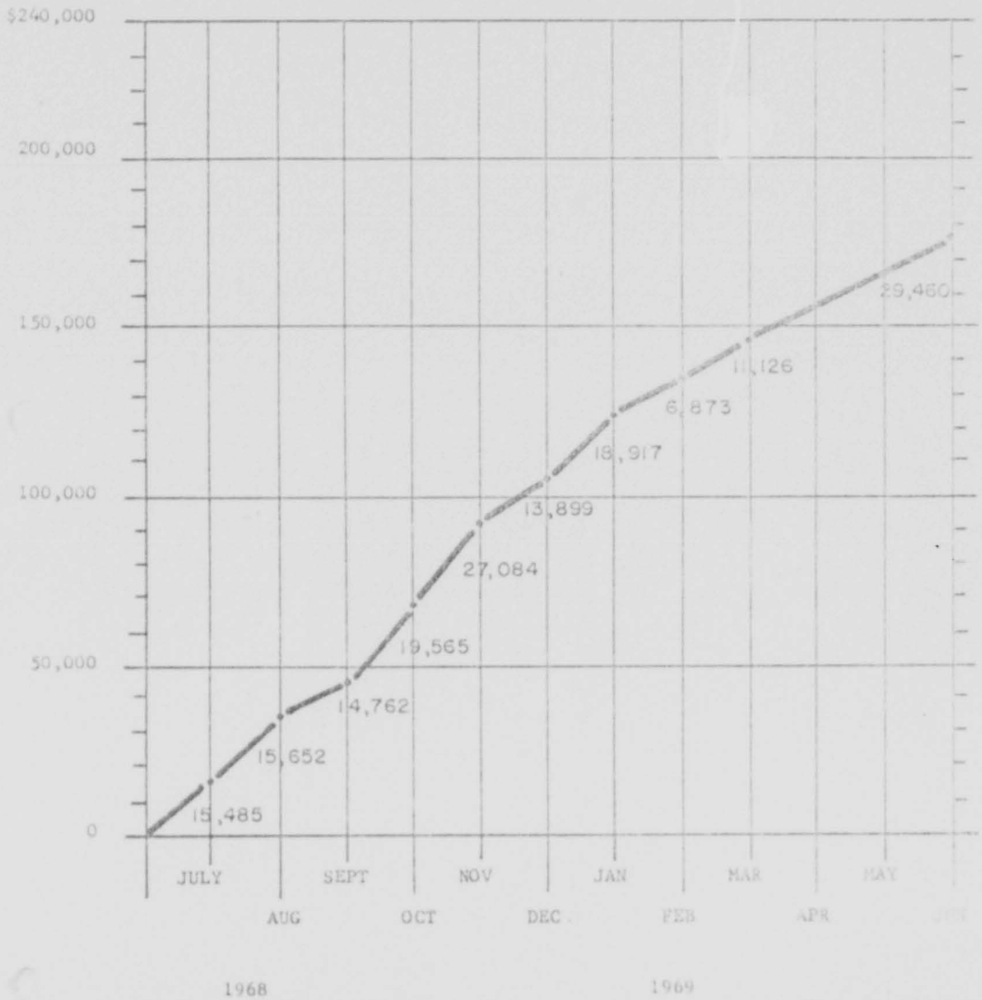
section receiving an outstanding evaluation.

Hq GEEIA conducted a training session during the month of April '69 to prepare for the implementation of a new Quality Assurance program to be utilized throughout the command. One of the Squadron Quality Control Senior NCO's attended this training, and the new program was implemented in the organization during May and June 1969.

FINANCE

TRAVEL/PER DIEM EXPENSES



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K E Y   P E R S O N N E L

Major Francis J Capell	-	Commander
Captain Mark Sheridan	-	Operations Officer
Captain Vernon F Steele	-	Support and Transportation Officer
Captain William Fruean	-	Communications-Electronics Officer
1st Lt John F Frasier	-	Chief, Administration
1st Lt Ladd A Prier	-	Communications-Electronics Officer
2nd Lt Larry D Pollock	-	Communications-Electronics Officer

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Training Project Outlines

for

Pilot Instructor Training - Flight Line

TPO 2-51-2-C-F

Primary Contact Lesson Guide

Air Training Command

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TRAINING PROJECT OUTLINES

for

Pilot Instructor Training - Flight Line
COURSE TITLE

IPO-C-51-3-CF
COURSE NUMBER

Primary Contact Lesson Guide
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FOREWORD

The mission of the Pilot Instructor School is "To teach rated pilots how to teach students to fly."

The "PIS Contact Lesson Guide" has been designed as an "Instructor" training publication intended to supplement the information, procedures, and directions given in the Primary Flying Manual (PFM), technical orders and/or by your instructor. Each training lesson is prepared for a particular "unit of instruction" or "unit of learning" rather than for any specific period of time.

Your attention is invited to the fact that the sequence of lessons or of maneuvers will not necessarily parallel those of the primary or basic flying schools. They are designed to cover maneuvers in a sequence which can readily be absorbed by rated pilots.

During this course of instruction emphasis will be placed on your ability to conduct briefings, adequately perform, demonstrate, and orally present maneuvers, and to analyze errors.

This lesson guide will aid you in understanding and analyzing maneuvers and help you increase your overall proficiency. You will not fly solo during this course of instruction but you will be assigned practice instruction flights with other pilots in your class. On these flights you will have an opportunity to increase both your flying and instructing techniques.

Accuracy landing stages are interspersed in the curriculum and are intended to provide you with the opportunity to increase your proficiency in traffic flying and landings.

3-2909-54

TABLE OF CONTENTS

Primary Contact Lesson Guide

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TPO-C-51-3-CF-1
May 1952

OUTLINE OF FIRST DAY'S OPERATION

I. OBJECTIVE:

To familiarize you with Pilot Instructor School policies, assign equipment and lockers to you and allow you to meet your instructors. This orientation period will include an explanation of the maneuvers and procedures listed below.

II. INTRODUCTION TO COURSE*

A. Objective of the school (Squadron Operations Officer).

B. Local flying regulations (Flight Instructor).

C. Flight line policies (Flight Commander).

D. Use of Primary Flying Manual, Technical Orders, and Contact Lesson Guide (Flight Instructor).

E. Discussion of oral presentation and instructor potential (Flight Instructor).

F. Discussion of grade folders, types of grade slips, and grading methods (Flight Instructor).

G. Responsibility on team flights (Flight Instructor).

H. Briefing and demonstration of the following aircraft checks and procedures (AN 01-60FFB-1 and Flight Instructor):

1. Pre-inspection.
2. Exterior inspection.
3. Pre-starting.
4. Starting engine.
5. Warm-up.
6. Pre-take-off.
7. Take-off.
8. Engine operation in flight.
9. Pre-landing.
10. Go-around.
11. After landing.
12. Stopping engine.
13. Emergency procedures.

* Sources of information are found in parenthesis.

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I. Local radio procedures (Flight Instructor).

J. Traffic patterns (Primary Flying Manual, traffic pattern charts).

K. Procedures when lost (Flight Instructor).

III. PROCEDURES:

A. After you have received the initial welcoming address by the Squadron Operations Officer, the Flight Commander of the Contact Flight to which you are assigned will brief you on flight line policies and procedures. You will then be assigned to your flight instructor who will further explain all procedures and policies incident to your training.

B. Your flight instructor will assign Contact Lesson I for study.

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CONTACT LESSON I (Primary)

PROFICIENCY CHECK-OUT

I. OBJECTIVES

A. To determine whether or not you employ safe flying techniques and methods.

B. To insure that you are able to demonstrate the required level of proficiency in front and rear seat landings.

C. To acquaint you with the local flying area, restricted zones, hazards to flight, and the location of auxiliary fields.

D. At the completion of this lesson, you should be able to accomplish the procedures and maneuvers listed below.

II. MANEUVERS*

A. All Ground Checks and Procedures (AN 01-60FFB-1).

B. Take-Off (Primary Flying Manual, pp. 51-54).

C. Traffic Exit (P. F. M., pp. 54-55).

D. Climbing Turns (P. F. M., pp. 40-44).

E. Level-Off Procedure (P. F. M., p. 45).

F. Familiarity with the Local Flying Area, Restricted Zones, Hazards to Flight, and the Location of the Auxiliary Fields (Flight Instructor).

G. Power-On Stalls (P. F. M., pp. 61-64).

H. Recovery from Inverted Flight (P. F. M., pp. 78-82, 191-193).

I. Emergency Procedures (AN 01-60FFB-1, pp. 33-40).

J. Safe 3-Turn Spin Recovery (One in Each Direction) (P. F. M., pp. 68-74).

* Sources of information are found in parenthesis.

K. Power-Off Stalls (P.F.M., pp. 64-66).

L. Gliding Turns and Power Letdown (P.F.M., pp. 45-49).

M. Simulated Forced Landing (P.F.M., pp. 147-150).

N. Traffic Patterns and Landings (P.F.M., pp. 161-165) (Front and Rear Cockpit).

III. LESSON PROCEDURE:

A. Ground Briefing:

1. Review procedures and techniques.

2. Review the pre-inspection cockpit check and visual inspection.

B. In the Aircraft:

1. Checks and Procedures:

After the initial check-out in the front seat, you will complete the contact phase in the rear cockpit on all dual flights. Perform the pre-inspection cockpit check and the visual inspection and review the cockpit, radio, and taxiing procedures. While you are in the front seat, review the cockpit and radio procedures, and then taxi to the take-off position.

2. Take-Off:

Your instructor will note the smoothness with which you apply power, your proficiency in maintaining directional control, and the technique you use in flying the aircraft off the ground.

3. Traffic Exit:

Make the traffic exit at the proper altitude. Your instructor will note

a. The degree of coordination you use while entering and recovering from the turns

b. Whether a constant bank and pitch attitude is maintained throughout the turn

c. Your anticipation of roll-out to correct for wind drift

d. Whether you are alert, looking around, and clearing yourself sufficiently.

4. Climbing Turns:

Perform climbing turns to working altitude. The instructor will note

a. The degree of coordination you use in rolling in and out of these turns

b. Whether bank and pitch attitude is held constant

c. Whether you continue to make climbing turns to clear the area, or if you climb straight ahead

5. Level-Off Procedure:

Level off at an altitude that you deem well above the minimum altitude for stall recoveries (5000' ind.). Your instructor will be interested in

a. The smoothness with which you lower the nose and maintain altitude

b. Your use of trim, and technique in reducing power from climbing to cruising

c. Your over-all technique and procedures used in leveling off at a given altitude.

6. Local Area, Auxiliary Fields, Hazards to Flight, and Restricted Areas:

Your instructor will fly the aircraft around the local area pointing out the town of Selma, the Alabama River, Craig AFB, Sel Field, and Henderson Field, which are the only prominent landmarks in the vicinity.

When you are circling Sel Field and Henderson Field notice the location of these auxiliary fields in relation to Craig Field. Your instructor will point out the type of terrain around the auxiliary fields and explain to you that most of the traffic patterns are made in such direction as will keep you from flying over the worst part of this terrain. One of the main hazards to flight in this area is the lack of suitable forced landing fields, therefore, you will be cautioned to maintain a safe altitude while flying over the uneven terrain in the local area. Forced landing procedures and other low altitude maneuvers may be practiced safely to the west of the home field where the terrain is flat and there are sufficient forced landing fields.

The town of Selma and all other towns in the local area are restricted and you are forbidden to fly over them. No airwork will be practiced over the home field or auxiliary fields, or within a radius of 10 miles of Craig AFB. No airwork will be accomplished in the 10 mile wide corridor extending straight west from Craig AFB. This corridor has been designated an airway. Stay away from the immediate vicinity of the radio range station, which is located 2.5 miles southeast of Craig AFB, and the commercial broadcasting station WGWC, which is located near the north edge of Selma.

7. Power-On Stalls:

Perform a power-on stall straight ahead, one to the right, and one to the left. Your instructor will note

a. The smoothness with which the entry is made

b. What pitch and bank attitudes are attained and whether they are held constant

c. Your rudder technique in correcting for torque

d. Your recognition of the stall when it occurs

e. Your stick action for recovery. (Was it definite and aggressive? Was aileron used during the stall? Was the nose allowed to lower sufficiently without becoming too low? Was the recovery smooth, or rough and bordering on a secondary stall?)

8. Recovery from Inverted Flight:

Your instructor will place the aircraft in the inverted position either by performing half of a slow roll or by performing a cross-control stall which will cause the aircraft to snap on its back. When the inverted position is attained, he will call you over the interphone and tell you to return the aircraft to the straight-and-level flight attitude. While you do this, he will be noting

a. Your reaction to inverted flight and any tenseness of the controls

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b. Your hesitation as to the first thing to do

c. The technique used to recover (roll-out or split "S")

d. The altitude you lose during the maneuver.

9. Emergency Procedures:

While flying at a safe altitude, the instructor will turn the fuel selector to the "OFF" position to simulate fuel starvation. You should turn the fuel selector to the "RESERVE" or "RIGHT" tank position when you see the fuel warning light burning and/or the fuel pressure dropping. You should then use the wobble pump until the light goes off and the fuel pressure is back to normal.

A run-away propeller might be encountered during the recovery from inverted flight, hence, this would be a good time to note the procedure to correct for this condition. If it does not occur, your instructor will simulate the condition by simply telling you the propeller is running away, meanwhile noting your corrective action which should be as follows:

a. Retard the throttle.

b. If the propeller is still running away, pull the propeller control back to full "DECREASE" position.

c. Pull the aircraft into a climb to increase the load on the engine.

d. When the propeller is under control, reset the RPM and power. NOTE: Due to excessive strains on the engine and propeller, a run-away propeller will never be caused intentionally.

Next, the instructor will simulate an engine-driven hydraulic pump failure, and will have you lower the landing gear and flaps. You should check the warning horn by retarding the throttle and then place the landing gear handle in the "DOWN" position. Notice how the gear lowers and locks of its own weight (if it does not, you should rock the wings, dive, and/or pull the aircraft up abruptly). You may now check the over-travel and recheck the warning horn. This is IMPORTANT: If you are unable to lower and lock the landing gear satisfactory by using the above procedure, notify the tower and stand by for instructions.

When the gear has been lowered and locked, place the flap handle in the full "DOWN" position and actuate the hand pump until the flaps have been lowered to the desired position. If partial flaps are desired, move the flap handle to the "LOCKED" position when the desired degree is attained. During all of the emergency procedures above, your instructor will note whether or not you have remembered the instructions he gave you in the first day's operation on the flight line.

10. 3-Turn Spin:

Clear the area thoroughly and enter a spin. Leave the throttle at 15" Hg as a precaution against a run-away propeller or an induction fire hazard. Your instructor will note

a. Whether or not you look around sufficiently and clear the area thoroughly

b. If full controls are held with the spin throughout its entirety

c. Whether or not you remain oriented and apply corrective measures at 3 turns

d. Whether full rudder is used against the spin for recovery, and if stick action is aggressive and sufficient to stop the spin cleanly

e. If aileron is used in recovery

f. Whether or not rudder is neutralized when rotation stops

g. Whether or not the resulting dive is prolonged, or if straight and-level flight is attained before excessive airspeed is gained and excessive altitude lost.

11. Power-Off Stalls:

Perform a series of power-off stalls, one straight ahead, one to the left, and one to the right. These stalls will be accomplished with the gear down and the flaps up. Lower the gear with the recommended procedure. Be sure the area is clear before beginning the stall series. The instructor will note

a. The smoothness with which the entry is made

b. What pitch and bank attitudes are attained and whether or not they are held constant

c. Your rudder technique (coordination) in correcting for rigging effect

d. Your recognition of the stall when it occurs

e. Whether or not recovery was begun at the first indication of stall, completed in a smooth manner, and with a minimum loss of altitude.

12. Letdown:

Continue down to traffic altitude. The technique used to lose altitude should be

a. Gliding turns to 3000'

b. Power letdown from 3000' to traffic altitude.

Your instructor will note whether or not you look around and clear the area sufficiently. (This is important around a student training field.)

13. Simulated Forced Landing:

During the letdown, your instructor will close the throttle completely and simulate a forced landing. Have a field already selected that is within gliding distance of the aircraft. This maneuver is given here for the following reasons:

a. Again, to note your reaction to an emergency

b. To determine your judgment of gliding angles, altitude, and distances

c. To note your selection of a suitable forced landing field

d. To determine your ability to plan a descent so that a base leg can be established without the necessity for steep turns, theoretically making a safe landing possible in the desired field

e. All of the above to determine whether or not you are able to cope safely with an emergency.

14. Traffic Pattern:

a. Maintain the correct altitudes, power settings, and/or airspeeds on all legs of the pattern

b. Perform the pre-landing check with the exception of lowering the landing gear on the 45-degree entry leg to the initial approach

c. Apply sufficient and proper drift correction to make good a desired ground track

d. Remain properly spaced with other aircraft and look around constantly

e. Lower the landing gear on the 180-degree cross-wind pitch-out

f. Do not hesitate to go around if it appears necessary.

15. Landings:

a. Start the round-out high enough to accomplish it smoothly and slowly. Do not wait until the aircraft is about to contact the ground to level off

b. Use the wing-low method for drift correction in cross-winds

c. Be sure the aircraft is not drifting or crabbing when the touchdown is made. Have the longitudinal axis of the aircraft aligned with the ground path

d. Be constantly alert to maintain directional control at all times during the landing roll. Remember, the rudder is primarily for directional control, the ailerons to keep the wings level

e. Remain alert to stop any changes in direction until the aircraft has reached a slow taxi speed, or until it has stopped completely

f. When your instructor feels you are proficient in front-seat landings, you will change seat positions and continue shooting landings until you are considered proficient in rear-seat landings.

C. <u>After the Flight</u>:

1. The critique will be held.

2. Your instructor will assign you any pages or chapter of the Primary Flying Manual, AN 01-60FFB-1, ATRC Regulation 51-2, 3615th Wing Regulation 51-3, or the Policy Files necessary to review any weak points of this lesson. He will also assign Contact Lesson II, Fundamental Flying Principles, for study.

3. Prior to engaging in team flights, a questionnaire on the T-6 and a formal check-out certificate must be accomplished.

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CONTACT LESSON II (Primary)

FUNDAMENTAL FLYING PRINCIPLES

I. OBJECTIVE:

You should have at the end of this instructional period, a thorough understanding of the techniques and procedures necessary to teach and perform the maneuvers and procedures listed below.

II. MANEUVERS*:

A. Taxiing (Primary Flying Manual, pp. 9-13).

B. Take-Off (P.F.M., pp. 51-54).

C. Traffic Exit (P.F.M., pp. 54-55).

D. Climbing Turns (P.F.M., pp. 40-44).

E. 3000' Procedure (Climbing) (AN 01-60FFB-1, p. 28).

F. Level-Off Procedure (P.F.M., p. 45).

G. Effect and Use of Controls (P.F.M., pp. 15-16).

H. Torque and Torque Effects (P.F.M., pp. 32-37).

I. Gentle, Medium, and Steep Turns (P.F.M., pp. 23-31).

J. Coordination Exercise (P.F.M., pp. 38-39).

K. Gliding Turns and Level-Off (P.F.M., pp. 47-50).

L. 3000' Procedure (Descending) (AN 01-60FFB-1, p. 28).

M. Power Letdown (P.F.M., pp. 45-47).

N. Traffic Pattern (P.F.M., pp. 103-116).

O. 360-Degree Overhead Landing Pattern for a 3-Point Landing (P.F.M., pp. 161-165).

* Sources of information are found in parenthesis.

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P. Go-Around Procedure (P. F. M., pp. 145-146).

III. LESSON PROCEDURE:

A. Ground Briefing:

Listed below are sixteen distinct functions, procedures, and/or maneuvers which comprise the ground briefing you are to explain.

1. Visual Inspection:

Brief on the importance of a proper and thorough visual inspection and stress the use of the check list in the performance of necessary procedures.

2. Taxiing:

You should point out the peculiarities involved in taxiing a conventional aircraft and discuss the proper use of S-turns, power, brakes, and tail-wheel lock.

3. Take-Off:

Explain the steps involved in performing a normal take-off as well as the technique used in a cross-wind take-off.

4. Traffic-Exit:

Show the necessity for an orderly flow of traffic, and discuss the minimum altitude for turns, the proper direction of turns, ground track, and the proper degree of bank in turns.

5. Climbing Turns:

Indicate the relationship of pitch attitude to power and airspeed and the reference points that can be used for control of pitch and bank attitudes.

6. 3000' Procedure:

Emphasize the importance and purpose of the 3000' procedure, clarifying any questions concerning the methods employed in executing this procedure.

7. Level-Off:

Discuss the technique and procedures necessary in performing

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the level-off.

8. Flight Controls:

Point out the use of the individual flight controls, discussing their relation to each other in controlling the attitude of the aircraft.

9. Torque and Its Different Components:

Gyroscopic action, asymetrical propeller loading, torque reaction, and corkscrewing effect of the slipstream should be discussed, pointing out how these components are interrelational and affect the aircraft.

10. Turns:

The difference between the various degrees of bank with respect to reference points and rate of turn should be discussed, showing how and why the rudder is used in entering turns. Impress upon the student's mind that rudder pressures will necessarily vary with the rate of entering turns, and the steepness of the bank.

11. Coordination Exercise:

Emphasize the necessity of proper orientation and coordination of controls. Stress the desired degree of bank and amount of turn to be used.

12. Gliding Turns:

Cover the cockpit procedure to be used, conditions of flight, and flight attitudes. The effect of rigging, the necessity of proper trim, and the use of power when clearing the engine should be considered here. Explain that gliding turns are normally used when descending from the higher working attitudes, and give the proper procedure for the level-off at 3000'.

13. Power Letdown:

Show how this type of descent is used for planning and clearing purposes. Cover the proper power settings, flight conditions, and flight attitude.

14. Traffic Pattern:

Break the pattern down into its components as follows and explain

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a. Pre-entry and entry legs.

Spacing, airspeed, altitude, ground track, and procedures to be accomplished.

b. Initial approach.

Point of entry, references, airspeed and altitudes, ground track.

c. 180-degree cross wind pitch out, down-wind leg, and 180-degree base-leg turn.

Reference for turning and proper bank, throttle technique, airspeed and altitude to key position, and glide entry, trim technique, and use of flaps up to and including the final turn.

d. Final approach.

Glide attitude, trim, use of flaps, and drift correction.

15. 3-Point Landing.

In your explanation break the landing down into its component parts as follows.

a. The round out:

Starting point and rate, references, and drifting correction.

b. The touchdown:

Attitude, drift correction, and directional control.

c. The after landing roll:

Directional control and the use of controls (ailerons, rudder, brakes, and power).

16. Go-Around Procedure:

Stress the need for recognizing when to go around, governing the proper sequence of procedure to be used.

B. In the Aircraft:

Demonstrate all pre-flight inspections and procedures (in accordance with AN 01-60FFB-1). Listed below are sixteen distinct

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functions, procedures, and/or maneuvers which you are to demonstrate and explain.

1. Demonstrate Taxiing and Use of the Tail-Wheel Lock:

   It is important that the student recognize the lack of forward visibility, the need for S-turning and looking around. Explain how the position of the control stick is determined by wind direction and velocity. Emphasize control of speed by proper use of the throttle and brakes, demonstrating the correct position for the feet. Stress the proper position of the rudder when unlocking the tail wheel. Have the student taxi the aircraft, analyzing and correcting his errors in technique.

2. Take-Off:

   It is necessary that the student realize the importance of smooth, positive application of power, use of rudder for directional control, and the use of ailerons to maintain a wing level attitude. Also, the use of proper elevator control to maintain the desired pitch attitude insuring a tail-low take-off should be demonstrated.

   When airborne, demonstrate the procedure used in retracting the landing gear, reducing power, establishing the climbing attitude, and correcting for drift. Stress the importance of establishing a constant pitch attitude by visual reference, and emphasize that the airspeed indicator is used as a further check for determining the proper climbing attitude.

3. Traffic Exit:

   Explain that the first turn in the traffic exit is accomplished at 500' above the terrain. Make the traffic exit, pointing out the proper direction of turns, the correct bank and pitch attitudes, and method of drift correction. Stress the use of ground references.

4. Climbing Turns:

   Explain that 90-degree precision turns without reference to ground track can now be made. Stress the use of reference points for proper pitch and bank attitudes and the need for torque correction and proper use or trim. If section lines or prominent reference points on the ground are available, explain how they can be used to increase precision. Point out the necessity of advancing the throttle in order to maintain the correct power setting with a gain of altitude, and also division of attention and

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smooth use of controls.

5. 3000' Procedure (Climbing):

At 3000' have the student slowly move the mixture control toward the "LEAN" position. Point out the resultant change in the sound of the engine. Show how excessive leaning of the mixture will produce a loss of power. Demonstrate how to determine the best mixture setting. Inform the student that the canopy position is optional at this point. It is good practice, however, to close the canopy as it will emphasize procedures and eliminate the danger of forgetting it during subsequent maneuvers.

6. Level-Off Procedure (Climbing):

Show how, and explain why the nose is lowered prior to reaching the desired altitude. Demonstrate the proper sequence of power reduction and fuel procedure. In order to impress the student with the necessity of retrimming, make the level-off, but do not trim the aircraft. Have him take the controls and maintain direction and proper pitch attitude. Point out that the forces required to do this are great, and could be tiring. Next, have the student relieve the pressure by smoothly adjusting the rudder and elevator trim tabs.

7. Use and Effect of Controls:

Explain the purpose of the individual flight controls and demonstrate the effect of each on the attitude of the aircraft. Emphasize the importance of the use of pressures rather than movements when using the controls. Stress upon the student's mind the idea that he should think of himself as being the point around which the aircraft pivots when maneuvered. Demonstrate the use of the trim tabs, and point out how they are used to relieve control pressures. To emphasize the effects of trim tabs, move them individually, and rapidly, through a wide range. Point out how the elevator and rudder controls will move in the same direction as the trim that is applied. Explain how the attitude of the aircraft is maintained with the controls, and any pressures necessary to achieve this are relieved by use of trim.

8. Torque and Torque Effects:

Before attempting to demonstrate these effects, point out that the causes are interrelated. Explain that the effect of torque will, for all practical purposes, remain the same, i.e., the tendency for the nose of the aircraft to yaw to the left. Explain and demonstrate that:

a. The effect of gyroscopic action is most apparent during take-off, or at any time the nose of the aircraft is lowered rapidly

b. The effect of asymetrical loading of the propeller is most apparent when the pitch attitude of the aircraft is increased above straight-and-level flight and a high angle of attack exists

c. Slipstream effect is most apparent at low airspeeds and high power settings. In this respect it is very closely related to asymetrical loading of the propeller

d. The effect of torque reaction is the tendency of the aircraft to roll to the left rather than yaw. This is most noticeable with low airspeeds and high power settings

9. Gentle, Medium, and Steep Turns:

Show how all turns are entered by simultaneous application of rudder and aileron pressures, altitude being held constant by maintaining the proper pitch attitude with elevator pressures. Explain that rudder pressure is used only to counteract aileron drag when rolling in and out of turns. Point out that with the aircraft in a banked condition, the force of lift turns the aircraft. Have the student note the reference points available for determining proper angles of bank. Stress the necessity for leading the roll-out for precision turns, and the need for a greater amount of back-stick pressure in steep turns, and the proper methods of correcting for altitude variation.

10. Coordination Exercise:

Explain the similiarity between the turns used in this maneuver and those previously practiced, and demonstrate the proper procedure for executing this maneuver. Stress the necessity for smooth use of controls, orientation, planning and division of attention. Discuss the advantages of practicing this maneuver when flying to working areas or to the auxiliary fields.

11. Gliding Turns:

The power setting, conditions of flight, and flight attitudes to be used during this maneuver should be discussed and explained. Show the proper entry, use of trim, and maintenance of bank and pitch attitudes. Emphasize the use of left-rudder pressure when

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rolling into left turns and out of right turns. Stress that elevator pressure is used to maintain the proper pitch attitude, the same as in level turns. Demonstrate the proper technique for clearing the engine, and for leveling off, emphasizing the effect and use of trim.

12. Power Letdown:

Explain the cockpit procedure to be accomplished prior to starting the descent, the power setting, conditions of flight and flight attitudes. Stress the use of varying degrees of bank and turn for clearing and planning purposes, showing that the technique used in these turns is the same as that used in turns previously practiced. Make sure the level-off procedure is thoroughly understood by the student.

13. Traffic Pattern:

Demonstrate the proper traffic entry and pre-landing cockpit check. Traffic is entered on a leg 45 degrees to the initial approach. The entire pre-landing check is completed here with the exception of lowering the landing gear and making the final horn check. Show how a constant altitude, airspeed, and ground track are maintained to a point midway down the runway. At this point, the 180-degree cross-wind pitch-out is executed and the landing gear is lowered. Emphasize that a medium bank is used in this turn. After rolling out on the down-wind leg, point out that the altitude is maintained and normal traffic airspeed is established. Demonstrate the proper procedure for re-checking the landing gear warning horn, establishing airspeed, and use of flaps and power in the 180-degree base-leg turn. Demonstrate retarding the throttle, trimming the aircraft and establishing the correct gliding attitude. Point out the maximum degree of flaps to be used, if flaps are necessary.

Demonstrate the 180-degree base-leg turn onto the final approach, emphasizing coordination and pitch and bank control. Cover the final approach thoroughly, emphasizing the proper use of flaps, drift correction, and control of the gliding attitude.

14. 3-Point Landing:

Demonstrate how and where the round-out is started, stressing the smooth use of controls, the rate of pitch change, and directional control. The wing-low method of drift correction should be made clear, emphasizing that this correction is maintained throughout the landing during the touchdown, point out that the longitudinal axis of the aircraft must be aligned with the ground track; stress the importance of maintaining directional control by proper use of rudder and brake, and the importance of keeping the wings level with ailerons.

15. Go-Around:

Make another take-off and fly a normal traffic pattern. When on the final approach and near the round-out point, made a go-around. Stress the proper use of power and the cockpit procedure. Explain and demonstrate the correct method of clearing the active runway, emphasizing the correct procedure for retracting flaps. Then, make the final landing.

16. After-Landing Check:

After the landing, show the student the correct procedure to be followed in the after-landing check, clarifying any questions that may arise.

C. After the Flight:

1. Hold the critique.

2. Assign Lesson III for study.

3. Grade the student.

CONTACT LESSON III (Primary)

ACCURACY LANDINGS

I. OBJECTIVE:

To familiarize you with the effect of wind on traffic pattern flying. To familiarize you with the various types of traffic patterns, landing approaches, and landings. At the end of this instructional period, you should be familiar with, and demonstrate proficiency in teaching the following:

II. MANEUVERS*:

A. Rectangular Course (Primary Flying Manual, pp. 97-101)

B. 90-Degree Power-Off Approach, 3-Point Landing (P. F. M., pp. 155-157)

C. 90-Degree Power-On Approach, 3-Point Landing (P. F. M., pp 158-159)

D. 90-Degree Power-On Approach, Wheel Landing (P. F. M., pp. 159-160)

E. 180-Degree Side Approach, 3-Point Landing (P. F. M., pp. 160-161)

F. 360-Degree Overhead Landing Pattern (3-Point Landing) (P. F. M., pp. 161-165)

G. Simulated Forced Landing (Elementary) (P. F. M., pp. 147-149) (AN 01-60FFB-1, pp. 33-40)

III. LESSON PROCEDURE:

A. Ground Briefing:

1. Rectangular Course:

Point out the similarity between this maneuver and the traffic pattern. Explain that this is a maneuver in which the wind is taken into consideration and a desired track is made good over the ground.

*Sources of information are found in parenthesis.

2. 90-Degree Power-Off Approach:

Point out that this approach to a landing is made without the use of power and that gravity is the sole propelling force acting on the aircraft. Explain how wind will affect accuracy in this type of approach and how flaps are used to control the glide angle.

3. 90-Degree Power-On Approach:

Show that in this type approach, partial power is used to bring the aircraft from the key position on the base leg to the round-out position of intended landing. Stress the proper use of flaps, power, and the effect of wind. Explain the use of this type approach in strange field landings and in various types of aircraft.

4. 180-Degree Side Approach:

Point out how this approach helps to develop judgment of speed and distance. Explain its use in emergency landings.

5. 360-Degree Overhead Landing Pattern:

Emphasize that this approach will assist in developing judgment in the proper use of flaps and power. Stress the similarity of this maneuver to the 90-degree power-on approach. Discuss the tactical use of this traffic pattern. Discuss the technique used in accomplishing wheel landings, stressing that the drift correction is the same as that used in 3-point landings.

6. Simulated Forced Landing (Elementary):

Show that the purpose of simulated forced landings is to develop coolness, judgment, planning ability, technique, and confidence in the event of an emergency. Brief the student on the election of forced landing fields and emergency cockpit procedures.

B. <u>In the Aircraft:</u>

1. Rectangular Course:

Select a field or a number of fields with a common boundary that describes a square or rectangle of sufficient length to simulate a normal traffic pattern. Show how this maneuver is the same as a normal traffic pattern. Enter the 45-degree entry leg at normal traffic pattern altitude and perform a complete pre-landing check. Turn onto the downwind leg and demonstrate how the aircraft is maneuvered to stay a certain constant distance from the field boundary. (Use the aileron trim tab as a visual check point and keep it on the field boundary.) Continue to fly along the down-wind leg until slightly past the cross-wind field boundary, and then execute a medium bank turn and demonstrate how the roll-out is made to assure sufficient drift correction and a ground track parallel to the field boundary. Continue to fly parallel with this boundary with the aileron trim tab still aligned. Continue this procedure completely around the four boundaries of the field.

Explain and demonstrate how drift correction must be applied on the cross-wind legs to remain the same distance from the field boundary at all times. Stress that all banks are medium, the rate of all turns is the same, and that turns from the down-wind leg to the cross-wind leg will have to be started sooner in order to compensate for wind drift. Turns from the up-wind leg to the cross-wind leg will have to be started later for the same reason. Point out that it is necessary to time the roll-in to the turns so that the aircraft remains the same distance from the field boundary when the roll-out is completed. Point out that altitude, airspeed, and distance from the field are held constant throughout the maneuver.

2. 90-Degree Power-Off Approach With 3-Point Landing:

Fly a normal rectangular pattern performing the pre-landing check on the 45-degree entry leg. Stress proper cockpit procedure, altitude and airspeed control. Make the turn from the entry leg to the down-wind leg so that upon roll-out the aircraft is approximately a wing-tip distance from the runway. Point out that all turns in the traffic pattern are of medium bank. Make the turn onto the base leg at the proper point and explain how drift correction is applied by timing the roll-out. Demonstrate how the airspeed is reduced on the base leg, pointing out the value of using approximate power setting. At the key position, close the throttle and maintain altitude until gliding speed is attained. Lower the nose to hold proper gliding attitude and trim the aircraft. Explain that use of flaps at this point is optional.

Demonstrate a turn onto the final approach, point out the angle of bank used, the maintenance of proper airspeed and coordination. When on the final approach, stress the necessity of judging the distances and glide angle to the intended landing spot. Demonstrate the proper use of flaps, the necessity of changing pitch attitude as they are lowered, and explain that the gliding attitude should give the impression that the aircraft is pointing just short of the landing spot. Then, demonstrate a 3-point landing. After completing the landing, and when clear of the landing area, complete the after-landing check.

3. 90-Degree Power-On Approach With a 3-Point Landing:

After the traffic entry and traffic pattern have been demonstrated, show that all procedures are the same as they were in the previous traffic pattern. Establish clearly in the student's mind that the base leg should be set further out than for the power-off approach, the airspeed reduced, and one-half flaps may be lowered. At the key position, the throttle is retarded substantially and normal gliding attitude is established. The final turn is accomplished as in the 90-degree power-off approach. When on final approach, the desired amount of flaps is lowered and a constant airspeed established. From this point the power is adjusted to control the rate of descent. The descent is continued until the normal roundout position is reached. At this point, the round-out for landing is started and at the same time the throttle is closed. Then, demonstrate the landing, and the proper procedure to be used when undershooting, overshooting and in crosswinds. Have the student practice the maneuver and correct any errors in technique.

4. 90-Degree Power-On Approach With a Wheel Landing:

Point out that the traffic pattern and approach for landing are the same as in the 90-degree power-on approach with 3-point landing. Then demonstrate the wheel landing, stressing the technique used.

5. 180-Degree Side Approach With A 3-Point Landing:

Even though the traffic altitude is higher, the student should be shown that the normal pattern is utilized, and that the pre-landing check is completed on the 45-degree entry leg, altitude and airspeed being held constant. Demonstrate how the roll-out on the down-wind leg is made slightly closer than wing-tip distance. Show how the throttle is closed when opposite the intended landing spot, how the normal glide is established, and how trim is used as in other power-off approaches. Explain that the first gliding turn (to the base leg) is made at an altitude high enough to permit a glide to what would normally be the key position in a 90-degree power-off approach. The glide is continued on the base leg until a position is reached where a medium bank turn can be used to assure alignment with the runway. Point out that the final approach, round-out and landing are the same as in the power-off approach with a 3-point landing. Explain that the use of flaps on the base leg is optional but not to exceed one-half. Have the student practice the 180-degree side approach with a 3-point landing, correcting any errors in his technique.

6. 360-Degree Overhead Landing Pattern:

Demonstrate the proper traffic entry and pre-landing cockpit check. Traffic is entered on a leg 45 degrees to the initial approach. The entire pre-landing check is completed here with the exception of lowering the landing gear and making the final horn check. Show how a constant altitude, airspeed and ground track are maintained to a point midway down the runway. At this point, the 180-degree cross-wind pitch-out is executed and the landing gear lowered. Emphasize that a medium bank is used in this turn. After rolling out on the down-wind leg, point out that the altitude is maintained and normal traffic airspeed is established. Demonstrate the proper procedure for re-checking the landing gear warning horn, establishing airspeed, and use of flaps and power in the 180-degree base leg turn. When on final approach, stress drift correction, use of flaps and power, and landing technique.

Have student practice the 360-degree overhead tactical landing pattern, correcting any errors in technique.

7. Simulated Forced Landing (Elementary):

Explain that the elementary forced landing is practiced by the student in order for him to learn to perform the necessary cockpit checks and procedures accurately, and promptly before making a 90-degree turn to a suitable landing field. Explain and demonstrate the definite steps to be followed in forced landing practice. During the first several demonstrations, maneuver the aircraft so that heading will conform to that of a base leg for the selected field. Be sure there is enough altitude and distance from the field to allow time to perform the necessary procedures, and then make a turn to the field before the aircraft comes too close to the ground. Point out the field to the student and then close the throttle and have him perform the necessary cockpit procedures. Have him turn onto the final approach at the proper time. If the turn on the final approach is correct, the gliding angle should give you the impression that the aircraft will land in the middle of the field. From this point the proper use of flaps would enable you to land the aircraft in the first third of the field. Have the student call "FULL FLAPS" to simulate use of

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flaps. Flaps will not actually be used in practice -- only simulated. Demonstrate the proper procedure to be used when climbing away from a forced landing field. Practice the elementary forced landing, stressing selection of fields, emergency cockpit procedure, coordination and attitude control, and drift correction. Keep the engine cleared and do not allow the aircraft to descend below the prescribed minimum altitude.

C. After the Flight:

1. Hold the critique.

2. Review weak points and high points of maneuvers covered during this lesson.

3. Assign Contact Lesson IV, Visual Flying Proficiency I.

4. Grade the student.

CONTACT LESSON IV (Primary)

VISUAL FLYING PROFICIENCY I

I. OBJECTIVES:

A. To familiarize you with the stalling characteristics of the aircraft; to enable you to recognize the approach of a stall and the occurence of the stall; and to develop in you the ability to properly enter and recover from stalls.

B. To introduce maximum performance climbing turns, and show you how to control the aircraft through large changes of airspeed and attitude.

C. To acquaint you with the spin; its proper entry and recovery.

D. At the completion of this lesson you should be familiar with the causes and effects of stalls and spins and have a thorough knowledge of the maneuvers listed below.

II. MANEUVERS*:

A. Approach to a Stall (Primary Flying Manual, pp. 57-60).

B. Power-On Stalls (P. F. M., pp. 61-64).

C. Maximum Performance Climbing Turns (P. F. M., pp. 167-170).

D. Spins (P. F. M., pp. 68-74).

E. Power-Off Stalls (P. F. M., pp. 64-66).

F. 360-Degree Forced Landing Stage

III. LESSON PROCEDURE:

A. Ground Briefing:

Review the previous lessons as needed and explain the following six procedures, functions, and/or maneuvers.

1. Approach to a Stall:

Clearly illustrate the power setting, conditions of flight, and

* Sources of information are found in parenthesis.

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flight attitudes. Point out that the approach to a stall is practiced so that the student may recognize stalls by sight, sound, and feel. Stress that it is also helpful in learning proper torque correction which is necessary to maintain directional control. Emphasize that this maneuver will be used to assist in flight planning.

2. Power-On Stall Series:

The power setting, conditions of flight, and flight attitudes are identical for this maneuver as in the approach to a stall. Point out that the power-on series is practiced in order for the student to learn proper recovery from stalls that could possibly occur when climbing out of a field, or during climbing turns. To supplement this, explain the correct method of stall recovery.

3. Maximum Performance Climbing Turns:

Discuss the power setting, conditions of flight, and flight attitudes. Illustrate that this maneuver helps to develop timing and feel of the aircraft while obtaining maximum performance. Stress that it is also helpful in learning proper torque control through constant changes of speed and attitude. Discuss the use of this maneuver in flight planning.

4. Spins:

Fully develop the power setting and conditions of flight. Explain the proper method of entry and recovery from spins. Emphasize that the spin is practiced so that the student may promptly and automatically recover from an unintentional spin. You should point out that it is a confidence building maneuver which teaches orientation in unusual attitudes. Explain the clearing turns that are peculiar to the spin.

5. Power-Off Stall Series:

When you have explained the power setting, conditions of flight, and flight attitudes for this maneuver, point out that it is practiced to learn the proper recovery from a stall that could possibly occur while turning onto the final approach, or when leveling off too high for a landing. Explain how this maneuver emphasizes the importance of maintaining correct gliding attitudes.

6. 360-Degree Overhead Forced Landing Stages:

Discuss the traffic pattern and radio procedures to be used. Show the value of this landing stage in developing judgment and technique which could be applied to actual forced landings. Explain the difference in cockpit procedures (landing gear) used in this landing stage and in actual forced landings on other than established landing fields. Cover the possible procedure that could be used to arrive at the correct altitudes in the landing pattern. Point out how wind affects the planning for this particular pattern.

B. In the Aircraft:

Have the student perform the cockpit checks and ground operating procedures as outlined in AN 01-60FFB-1, and then allow him to taxi, take off, and climb to the working area as outlined in Lesson II. Review any weak points of previous lessons and then demonstrate and explain the following six maneuvers.

1. Approach to a Stall:

Emphasize the necessity of clearing the area and using the correct procedure. After clearing the area, slowly raise the nose of the aircraft to the correct pitch attitude, being sure to point out how directional control is maintained by use of the rudder, and how the wings are held level by use of the ailerons. Before the stall occurs, lower the nose to the level flight attitude and explain the approach to a stall in a climbing turn. Illustrate that the wings are returned to a level attitude prior to lowering the nose. Have the student practice the approach to a stall both in straight ahead and climbing turns, then analyze and correct any errors in technique.

2. Power-On Stall Series:

Again, emphasize the necessity of clearing the area, using the proper procedure. After clearing the area, slowly raise the nose of the aircraft straight ahead and establish the correct pitch attitude. Show how directional control is maintained by use of the rudder and how the wings are held level with ailerons. You must stress that this pitch attitude is maintained until the stall occurs. Demonstrate and explain the correct stall recovery technique. In the turning stalls, point out how the bank and pitch attitudes are attained simultaneously, and how all control pressures must be increased to maintain a constant attitude and rate of turn. Point out that the recovery technique is identical with that used in the stall straight ahead, and have the student practice the power-on stall series. Remember to analyze and correct any errors in technique.

3. Maximum Performance Climbing Turns:

Although no clearing turns are required for this maneuver, you should stress the necessity of looking in the direction of the turn and ascertaining that the area is clear prior to the entry. Explain and demonstrate how the bank and pitch attitudes are increased simultaneously during the entry, and how the roll-out is started and accomplished as soon as the maximum bank attitude is attained. Point out the reason for the slight hesitation after the wings become level and prior to lowering the nose to level flight attitude. Emphasize the necessity for proper torque correction throughout the maneuver. Have the student practice the maximum performance climbing turn, then analyze and correct any errors in his technique.

4. Spins (Left and Right):

After explaining and demonstrating the correct procedure for clearing the area, illustrate the correct throttle technique used and point out that the spin will be accomplished in the same direction as the second clearing turn. The student should understand the correct pitch attitude for entry, how the rudder is used to lead the spin entry, and why full controls must be held throughout the spin. Stress the need for orientation and relaxation. Demonstrate and stress the correct technique used during the entry and recovery, and how the maximum performance climbing turn is used to regain lost altitude. After you have had the student practice spins, analyze and correct any errors in his technique.

5. Power-Off Stall Series:

Demonstrate the cockpit procedures and clearing turns that are made prior to entering the maneuver, and emphasize that before entering the stall, the gliding attitude is established and the aircraft is trimmed. Slowly raise the nose of the aircraft to the correct pitch attitude and point out how directional control is maintained by utilizing the rudder, and how the wings are held level by use of ailerons. You must stress that the recovery is initiated at the first indication of the stall, and that the normal recovery technique is used.

In the turning stalls, emphasize first, that the glide straight ahead is established, then the bank and turn, and finally, the correct pitch attitude. Make sure that the student understands that all control pressures must be increased to maintain a constant attitude and rate of turn, until the first indication of the stall is apparent. Point out that the normal stall recovery technique is used and demonstrate that this maneuver is a simulated go-around procedure and make it clear to the student that it is used to return the aircraft to normal flight conditions. Then have the student practice the power-off stall series and analyze any errors in his technique, making sure to correct them.

6. 360-Degree Forced Landing Stage:

Using an auxiliary landing field, demonstrate the correct procedure for entering and establishing the upper traffic circle. Explain how the aircraft is maneuvered to correct for wind drift. Upon receipt of the call from runway control denoting a forced landing; acknowledge the call, perform the emergency cockpit procedure; establish the glide, and trim the aircraft. While descending, explain your maneuvering to show how you will arrive over the runway at an altitude that will assure completion of the desired lower traffic pattern. When on the down-wind leg of the lower traffic pattern, point out the similiarity to the 180-degree side approach. After the landing gear is lowered emphasize that the pitch attitude must be changed in order to maintain the correct gliding airspeed. During the 180-degree base-leg turn, stress the need for using the correct amount of flaps to compensate for the effect of wind. Demonstrate the go-around procedure and the correct method of regaining upper traffic altitude. Have the student practice the 360-degree forced landing stage from various positions in the upper traffic circle, and analyze and correct any errors in his technique.

C. <u>After the Flight:</u>

1. Hold the critique.

2. Assign the student whatever pages of the Primary Flying Manual necessary for a review of his weak points.

3. Assign Lesson V.

4. Grade the student.

CONTACT LESSON V (Primary)

VISUAL FLYING PROFICIENCY II

I. OBJECTIVE:

To familiarize you with the procedures and techniques employed in successfully completing the maneuvers in this lesson. At the end of the instructional period you should be able to demonstrate a proficiency in the teaching of maneuvers and procedures listed below.

II. MANEUVERS*:

A. Rudder-Controlled Stall (Primary Flying Manual, pp. 75-77).

B. Chandelle (P.F.M., pp. 170-172).

C. Loop (P.F.M., pp. 185-187).

D. Characteristic Stall (P.F.M., pp. 66-68).

E. Advanced Forced Landing (P.F.M., pp. 149-150).

F. Low Altitude Forced Landing (P.F.M., pp. 150-151) (AN 01-60FFB-1, p. 34).

III. LESSON PROCEDURE:

A. Ground Briefing:

Review the student's weak points on any maneuvers of the previous lesson and how the fundamentals of torque control, maximum performance, and stall recoveries already practiced in the previous lesson, can be applied to the maneuvers in this lesson. Listed below are six maneuvers which should be explained to the student.

1. Rudder-Controlled Stall:

The student should know the power setting, conditions of flight, and flight attitudes in rudder-controlled stalls. Point out that this maneuver is used to teach the value of maintaining directional control in stalls, to prevent spins, and maintaindirectional

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control during landings. Then describe the correct recovery technique.

2. Chandelle:

You should explain the power setting, conditions of flight, and flight attitudes, and impress upon the student the fact that this is a maximum performance maneuver in which the pitch and bank attitudes are changing constantly. Discuss how this maneuver helps to develop precision, coordination, and orientation. Fully illustrate how it teaches proper torque correction at varying speeds, proper timing, and develops a feel for the aircraft.

3. Loop:

After the student clearly understands the power setting, conditions of flight, and flight attitudes, explain how acrobatic maneuvers help to develop a more sensitive feel for the aircraft, improve ability to coordinate the flight controls, instill confidence, and develop proper methods of recovery to normal flight attitudes.

4. Characteristic Stalls:

Discuss the power setting, conditions of flight, and flight attitudes and then explain how this maneuver is used to determine the stalling characteristics of any particular aircraft. Point out how a knowledge of these characteristics can be helpful in anticipating them during landings and explain the proper recovery technique.

5. Advanced Forced Landings:

Explain that the emergency cockpit procedure and the selection of fields will be the same as in the elementary forced landing, previously practiced. The student should understand how the 180-degree side approach and 360-degree overhead approach can be readily adapted to successfully complete the landing. You must re-emphasize the effect of wind, proper drift correction, minimum final turn altitude, and maximum bank to be used.

6. Low Altitude Force Landings:

Make clear to the student that the same emergency cockpit procedure will be used as on other forced landings, and stress the necessity for quick and accurate reactions and correct judgment of speed and distance. The importance of immediately assuming a safe gliding attitude should be stressed along with the danger of attempting low turns.

B. In the Aircraft:

Have the student perform the cockpit checks and ground operating procedures as outlined in AN 01-60FFB-1. Have him taxi, take off, and climb to the working altitude and then review any weak points in the previous lessons. When this is finished, demonstrate the following six maneuvers.

1. Rudder-Controlled Stalls:

Emphasize the necessity of clearing the area and demonstrate the correct procedure to be used. After clearing the area, slowly raise the nose of the aircraft to the correct pitch attitude. Explain and demonstrate how directional control is maintained by use of the rudder and how the wings are held level by use of the ailerons. When the stall occurs, explain and demonstrate that the stick is brought fully back in a smooth manner and that directional control is maintained with rudder. Emphasize to the student that he should concentrate on directional control rather than on keeping the wings level. Point out that the rudder should be used instinctively rather than mechanically and that no aileron should be used. Illustrate that the normal stall recovery technique is used, but it is delayed until the nose reaches the horizon. Have the student practice the rudder-controlled stall, then analyze and correct any errors in his technique.

2. Chandelle:

Stress that although no clearing turns are necessary for this maneuver, the student should look in the direction of the turn and ascertain that the area is clear. Explain and demonstrate how the nose is lowered to attain the correct entry airspeed (do not lead the airspeed). Emphasize the importance of beginning the roll-in and pull-up simultaneously. Point out that the pitch attitude of the aircraft increases throughout the 180 degrees of turn; however, the bank is gradually increased to a maximum during the first 90 degrees of turn, and is gradually decreased back to a level attitude during the last 90 degrees of turn. You must stress that the maximum back-stick pressure is necessary at the point of maximum bank, which should occur at 90 degrees of turn. Emphasize the effect of torque, the difference in torque correction necessary when performing the maneuver to the left and to the right, and during roll-outs. Point out the slight hesitation after completing the roll-out, and before lowering the nose to level flight attitude. Let the student practice the chandelle, analyzing and correcting any errors in his technique.

3. Loop:

After explaining and demonstrating the correct procedure for clearing the area and attaining the entry airspeed, demonstrate the proper pull-up technique for entering the maneuver. Stress the correct control technique necessary to prevent stalling, and to maintain coordination and directional control, and the importance of ground references for orientation. You should have the student practice the loop, and be sure to correct any errors in his technique.

4. Characteristic Stall:

Show the student the cockpit procedure and the correct clearing turns required before entering the characteristic stall. Emphasize that prior to entering the stall the gliding attitude is established, flaps lowered, and the aircraft trimmed. In performing the stall, slowly raise the nose of the aircraft to the correct pitch attitude, pointing out how directional control is maintained by use of the rudder, and how the wings are held level by use of ailerons. Explain and demonstrate what should be done when the stall occurs: the stick is brought fully back in a smooth manner - no corrections are made for changes in direction or banking attitude. Point out that the normal stall recovery technique is used but is delayed until the nose reaches the horizon. Explain and demonstrate how a simulated go-around procedure is used to return the aircraft to normal flight conditions. Have the student practice the characteristic stall, then point out any errors in his technique.

5. Advanced Forced Landing:

Point out a suitable forced landing field and maneuver the aircraft to an altitude and position from which a 180-degree side approach or a 360-degree overhead approach can be accomplished. Close the throttle and have the student perform the emergency cockpit procedure. Maneuver the aircraft, using one of the above patterns, in order to arrive at the key position on a simulated base leg at approximately traffic altitude. During the demonstration stress these points:

a. Correct cockpit procedure.

b. Coordination and correct gliding attitude.

c. Drift correction throughout the pattern.

d. Judgment of speed, distances and angular gliding references.

e. Correct procedure to denote use of flaps.

With the student flying the aircraft over the demonstration field, have him simulate forced landings from various positions and altitudes. Stress the advantages of the 180-degree side and 360-degree overhead approaches and analyze and correct any errors in his technique and judgment.

6. Low Altitude Forced Landing:

During the climb-out, or in the first turn from a preceding forced landing, close the throttle for simulated low altitude forced landing. Stress the paramount importance of immediately lowering the nose, having the student perform the emergency cockpit procedure. Maneuver the aircraft toward a selected field and be sure to stress that banks and turns are held to a minimum.

With the student flying the aircraft, simulate low altitude forced landings from previous forced landings and also from ground track maneuvers. Stress and check the correct positioning of the fuel selector valve, and analyze and correct any errors in technique and judgment.

C. After the Flight:

1. Hold the critique.

2. Assign any pages or sections of the Primary Flying Manual necessary for a review of the student's weak points.

3. Assign Lesson VI.

4. Grade the student.

CONTACT LESSON VI (Primary)

BASIC ACROBATICS

I. OBJECTIVE:

To review weak points on maneuvers covered in previous lessons and to have you demonstrate and orally present the maneuvers and procedures listed below.

II. MANEUVERS*:

A. Lazy Eight (Primary Flying Manual, pp. 172-175)

B. Slow Roll (P. F. M., pp. 190-191)

C. Half Roll and Reverse (P. F. M., pp. 191-193)

D. Barrel Roll (P. F. M., pp. 187-188)

III. LESSON PROCEDURE:

A. Ground Briefing:

Review the student's weak points on the previous lesson. Be sure he understands the What, Why, and How of each maneuver in the previous lesson, and review the high points of each maneuver. Discuss the effects of torque during maximum performance maneuvers and go over the student's weak points on any previous acrobatic maneuvers. Explain to the student that the maneuvers covered in this lesson will help him develop a more sensitive feel for the aircraft, improve his ability to coordinate flight controls, instill confidence, familiarize him with abnormal flight attitudes and assist him in learning proper methods of recovery to normal flight attitudes. Clearly explain the following four basic acrobatics.

1. Lazy Eight:

In this maneuver the following should be understood: The power settings, changing flight attitudes, and the conditions of flight. You should emphasize the importance of smooth, coordinated pressures, proper torque correction in all speed ranges, and planning necessary to attain the desired flight pattern.

* Sources of information are found in parenthesis.

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2. Slow Roll:

The student must possess a full understanding of the power settings, conditions of flight and flight attitudes. He must be familiar with the procedure used in clearing the area and attaining the entry airspeed. List and explain the reasons for varying the direction and degree of control pressures during the maneuver for the student's benefit.

3. Half Roll and Reverse:

Explain the power settings, conditions of flight and flight attitudes for this maneuver. Familiarize the student with the procedure used in clearing the area and attaining the entry airspeed, and discuss the similarity of this maneuver to the slow roll.

4. Barrel Roll:

Fully cover the power settings, conditions of flight and flight attitudes, and describe the procedure for clearing the area and attaining entry airspeed. The student should understand the correct use of controls to assure the desired flight pattern and proper coordination.

B. <u>In the Aircraft:</u>

Have the student perform the cockpit checks and ground operating procedures (as outlined in AN. 01-60FFB-1), taxi, take-off, climb to the working altitude. After reviewing any weak points of his previous lessons, demonstrate the following acrobatics:

1. Lazy Eight:

Clearly illustrate the pattern of this maneuver and explain the necessity of constantly changing pitch and bank attitudes. Stress the correct use of reference points to insure precision and orientation and emphasize the constantly changing control pressures necessary to effect proper coordination and make a concentric pattern. The student should understand that this maneuver is done in a smooth, lazy manner and without hesitation. Emphasize the fact that the airspeed is used only as a check on the pitch attitudes assumed in the pattern.

2. Slow Roll:

Point out the necessity of properly clearing the area, and the correct method of attaining the entry airspeed and pitch attitude. The

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student must understand that the roll is started with coordinated aileron and rudder pressures. Stress the importance of maintaining the rate of roll with ailerons, and the use of elevator and rudder control in keeping the nose of the aircraft on the reference point. Describe how aileron pressure is relaxed throughout the last 90 degrees of roll, to prevent "dishing out". Impress upon the student that he should think of himself as the point about which the aircraft rotates, and that the functions of the flight controls are not changed. Re-emphasize the importance of relaxation and orientation.

3. Half Roll and Reverse:

Emphasize the necessity of properly clearing the area, and the correct method of attaining the entry airspeed and pitch attitude. Point out the similarity between this maneuver and the slow roll. This maneuver is the same as the first half of a slow roll in one direction, and the last half of a slow roll in the opposite direction. Stress that the aircraft should be in inverted flight only long enough to reverse the direction of roll.

4. Barrel Roll:

You must emphasize the necessity of properly clearing the area and point out the correct method of attaining entry airspeed, and beginning this maneuver. Make it clear that this is a coordinated maneuver and that definite seat pressures are maintained throughout. The student should understand that the ailerons are used to roll the aircraft, and the rudder and elevators are used to effect coordination. Illustrate the difference in rudder pressures required to roll to the left and to the right. Emphasize the fact that sufficient aileron pressure must be applied to maintain a constant rate of roll. Finally, explain the desirability of performing this maneuver in a smooth manner.

C. After the Flight:

1. Hold the critique.

2. Refer the student to the material in the Primary Flying Manual which covers his weak points.

3. Assign Conact Lesson VII.

4. Grade the student.

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CONTACT LESSON VII (Primary)

STALLS, IMMELMANN, AND SLOW FLIGHT

I. OBJECTIVES:

A. To acquaint the student with stalls that may occur from any flight attitude as a result of improper use of the controls and to demonstrate to him that the aircraft can stall at any airspeed, attitude, or power setting.

B. To review the weak points of previously demonstrated acrobatic maneuvers.

C. To show the student an attitude of flight in which the nose or pitch attitude is held high and the power is adjusted to obtain a minimum airspeed at which controlled flight may be maintained.

D. At the end of this lesson you should be able to explain and demonstrate the causes and effects of accidental stalls, and be able to explain how each of the demonstration stalls is related to normal flying maneuvers.

II. MANEUVERS*:

A. Secondary Stall (Primary Flying Manual, pp. 77-78).

B. Excessive Back-Pressure Stall (P.F.M., pp. 78-80).

C. Excessive Top-Rudder Stall (P.F.M., pp. 80-81).

D. Excessive Bottom-Rudder Stall (P.F.M., pp. 81-82).

E. Cross-Control Stall (P.F.M., pp. 83-85).

F. Elevator Trim-Tab Stall (P.F.M., pp. 82-83).

G. Immelmann (P.F.M., pp. 189-190).

H. Slow Flight (P.F.M., pp. 85-88).

III. LESSON PROCEDURE:

* Sources of information are found in parenthesis.

A. Ground Briefing:

Review the weak points of the previous lesson, and review the high points of each maneuver for standardization purposes. Discuss the aerodynamics of stalls and explain how they may occur at any airspeed, attitude, or power setting. Review the weak points of previously demonstrated acrobatic maneuvers and the go-around procedure.

After this you should fully describe the relationship of each demonstration stall to a particular proficiency maneuver. Explain how erratic, excessive, and mechanical control movements may result in stalls that otherwise would not have occurred. The student should understand the importance and value of properly recovering from inverted flight by rolling and not by allowing the aircraft to Split "S." The stalls and maneuvers which are to be explained follow.

1. Secondary Stall:

After a full explanation of the power setting, conditions of flight, and flight attitudes, point out how the secondary stall is used to show the result of attempting to recover too rapidly from a preceding stall. Then fully instruct the student in the correct recovery technique.

2. Excessive Back-Pressure Stall:

Explain the power setting, conditions of flight, and flight attitudes. Point out that this stall is used to show the effect of attempting to increase the rate of turn excessively with back-stick pressure, and make sure the student knows that this maneuver is a good example of a high-speed stall. Explain the correct recovery technique.

3. Excessive Top-Rudder Stall:

Fully establish in the student's mind the proper power setting, conditions of flight, and flight attitudes. Point out that this maneuver will show the effects of misuse of rudder in steep turns, i.e., attempting to correct attitude changes with rudder alone. Then explain the correct recovery technique.

4. Excessive Bottom-Rudder Stall:

Give the power setting, conditions of flight, and flight attitudes. Point out that this maneuver is also demonstrated to show the effect of misuse of rudder in steep turns, and then explain the

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correct recovery technique.

5. Cross-Control Stall:

Give the power setting, conditions of flight, and flight attitudes, and show that this maneuver is demonstrated to point out the effects of attempting to speed up the rate of a final approach turn with inside rudder while maintaining a constant bank with opposite aileron pressures. Explain the correct recovery technique and the difference in the characteristics of this stall when performed to the left and to the right.

6. Elevator Trim-Tab Stall:

After discussing and explaining the power setting, conditions of flight, and flight attitudes, point out that this stall is demonstrated to show the effects of improper trim and control techniques during a go-around. Then, explain the proper recovery technique.

7. Immelmann:

The power setting, conditions of flight, and flight attitudes are first explained and then the similarity of the Immelmann to the loop and half roll are pointed out. Stress the orientation and coordination required to perform the maneuver.

8. Slow Flight:

Fully describe the proper power setting, conditions of flight, and flight attitudes, and tell the student that slow flight is practiced in order to learn the proper technique of effectively using the controls at slow airspeeds. Emphasize the relationship between this maneuver and the go-around procedure.

B. <u>In the Aircraft</u>:

Have the student perform the cockpit checks and ground operating procedures (as outlined in AN.01-60FFB-1), taxi, take-off, and climb to the working area. Review any weak points of previous lessons to check the student's proficiency, and then go over the following stalls and maneuvers.

1. Secondary Stall:

Explain that for demonstration purposes, a normal power-on stall and stall recovery will be used, and then perform a power-on stall recovery. When the nose is lowered below the level flight

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attitude, attempt to bring it up abruptly with an excessive amount of back-stick pressure. When the aricraft shudders upon entry into the secondary stall, release the back-stick pressure and execute a normal stall recovery. Point out that the aircraft has a tendency to roll to the right when the stall is caused by excessive back pressure. Demonstrate this stall also from power-off stalls, spins, and other stall maneuvers. Have the student practice the secondary stall and correct his errors.

2. Excessive Back-Pressure Stall:

From straight-and-level flight enter a steep turn to the right or left. When the turn has been established, begin applying excessive back pressure to the stick. Continue to increase the pressure until a stall occurs, being sure that the airspeed is at or below the maximum permissable. As soon as the stall occurs effect a normal stall recovery and establish straight-and-level with coordinated control pressures. Demonstrate this stall from both right and left turns and explain the fact that the aircraft has a tendency to roll to the right upon stalling. Show how the aircraft rolls up to straight-and-level flight from a left turn and how it rolls under the bottom and toward inverted flight from a right turn. From the left turn, when the aircraft stalls and rolls toward the top, merely stop the roll as soon as possible and roll back to level flight. If the roll is vicious and cannot be stopped before the inverted flight attitude is reached, continue the roll past the inverted position and on up to level flight. Have the student practice the excessive back-pressure stall and then correct errors in his technique.

3. Excessive Top-Rudder Stall:

Enter a steep turn to the right or left from straight-and-level flight, point out that the stall is a result of the simultaneous application of excessive back pressure to the stick and excessive top-rudder pressure. Continue to increase the pressure until a stall occurs. Be sure the speed is at or below the maximum permissible. When the stall occurs, effect a normal stall recovery and re-establish straight-and-level flight with coordinated control pressures. Demonstrate this stall from both right and left turns, and show how the aircraft will roll in the direction of the applied rudder. From the left turn, the top rudder will be augmented by the offset vertical stabilizer and a rather vicious roll will result. After the student has practiced the excessive top-rudder stall, analyze and correct the errors in his technique.

4. Excessive Bottom-Rudder Stall:

From straight-and-level flight enter a steep turn to the right or left. Begin this maneuver with the nose higher than normal for a steep turn. This will prevent the bottom rudder from pulling the nose down excessively and causing high speeds. Point out that the stall is a result of simultaneous application of excessive back pressure to the stick and excessive bottom-rudder pressure. Continue to increase the pressures until a stall occurs. Be sure the speed is at or below the maximum permissible. When the stall occurs, effect a normal stall recovery and re-establish straight-and-level flight with coordinated control pressures. Demonstrate this stall from both right and left turns. Point out that the aircraft will roll in the direction of the applied rudder. From the right turn, the bottom rudder will be augmented by the offset of the vertical stabilizer, causing a vicious and rapid roll toward the inverted position. The student should practice the excessive bottom-rudder stall.

5. Cross-Control Stall:

Simulate a glide on the base leg. Roll into a normal gliding turn and simulate overshooting the runway on the final approach turn. Attempt to increase the rate of turn by applying pressure to the inside rudder. This will tend to cause the bank to increase. This inside rudder will also act as a bottom rudder necessitating back-stick pressure and opposite aileron pressure to maintain a constant pitch and bank attitude. Continue to increase all pressures until a stall occurs. When the stall occurs, effect a normal stall recovery. From either turn, when aircraft rolls toward the bottom, stop the roll as soon as possible and roll back to level flight. If the roll is vicious and cannot be stopped before inverted flight is reached, continue the roll past the inverted position and on around to the level flight attitude. Have the student note the amount of altitude lost in the maneuver. Have the student practice the cross-control stall, advising him on how to improve his technique.

6. Elevator Trim-Tab Stall:

Inform the student that you are simulating a go-around from a normal full-flap gliding attitude. The first demonstration should be made to show the result of failure to take corrective action when power is applied. Explain to the student that if no corrective action is taken after power application,

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the nose will rise rapidly and yaw to the left, causing the aircraft to stall, and hammerhead off to the left. Point out the approximate attitude in which the aircraft would have contacted the ground if the stall had occurred during a go-around. The second demonstration should be made to show the student the correct method of breaking the stall. As soon as the stall occurs, break the stall and lower the nose to normal-climbing attitude. If the aircraft fails to stall before the vertical pitch attitude is reached, recover immediately. The next demonstration is made to show the student the correct method of preventing a stall when a large application of power is made and the aircraft is properly trimmed for the glide. When power is applied, trim the pressures off the controls as soon as possible and complete a normal go-around procedure. Have the student practice the elevator trim-tab stall, pointing out his errors in technique.

7. Immelmann:

Indicate the necessity for clearing the area. Attain the initial airspeed by diving through the second clearing turn and pull up in the same manner used in the loop. The pull-up should be slightly faster than that used for the loop. When the nose reaches approximately an inverted three-point attitude, begin a half-roll to level flight. Point out that the roll should be started with the stick. In this manner, you are leading the roll with aileron. Continue the roll with aileron and hold the point with rudder and elevator, pointing out that aileron pressure must be decreased slightly through the last 90 degrees of roll to prevent adverse yaw from pulling the nose through the point. This maneuver should be completed with the nose on the original heading. If difficulty is encountered in maintaining the point, the nose may be lowered slightly during the last portion of the roll. Again, for the purpose of improving his technique, have the student practice the Immelmann.

8. Slow Flight:

Demonstrate the proper procedure for entering this maneuver, pointing out that any excessive, rapid, or erratic control pressures will cause an immediate stall. Show the student how gentle and smooth he must be on the controls to achieve the desired response. Point out how a small amount of bank gives a fairly rapid rate of turn at low airspeeds. Have the student deliberately stall the aircraft to emphasize the necessity for smooth and gentle control pressures at low airspeeds. Demonstrate a stall that could possibly occur in a go-around by holding a nose-high attitude and raising the flaps in one movement. Allow the student to practice slow flight, then analyze and correct errors in his technique.

C. After the Flight:

1. Hold the critique.

2. Assign any work in the Primary Flying Manual necessary to eliminate his weak points.

3. Assign Lesson VIII.

4. Grade the student

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CONTACT LESSON VIII (Primary)

ADVANCED ACROBATICS

I. OBJECTIVE:

To review weak points of previous maneuvers and to acquaint you with the procedures and techniques required to proficiently perform and teach these acrobatics.

II. MANEUVERS*:

A. The Clover Leaf (Primary Flying Manual, Appendix 4)

B. The Cuban Eight (P. F. M., Appendix 4)

C. Recovery from Vertical Flight (P. F. M., Appendix 4)

III. LESSON PROCEDURE:

A. Ground Briefing:

Stressing standardization and technique, review the high points of any previous maneuvers. After this explain the following maneuvers:

1. Clover Leaf:

Explain the power setting, conditions of flight, and flight attitudes Discuss the technique used to pull up and to roll, pointing out the the similarity of this maneuver to the loop and to a normal turn. Explain how to remain oriented and how to retain an overall picture of the continuity of the maneuver.

2. Cuban Eight:

After explaining the power setting, conditions of flight and flight attitudes, discuss the technique used to pull up and to roll. Point out the similarity of this maneuver to the loop. Explain the similarity of the roll in this maneuver to that used in the Immelmann, and how to remain oriented and maintain the continuity of the maneuver.

* Sources of information are found in parenthesis.

3. Recovery from Vertical Flight:

Discuss the power setting, conditions of flight and flight attitudes, and explain the need for a smooth pull-up. Point out the similarity between the roll on the top and the roll used in the clover leaf. Show the similarity between roll to level flight, and the roll used in the Immelmann and make the student aware of the necessity for looking around to remain cleared and to maintain the continuity of the maneuver.

B. In the Aircraft:

Have the student perform the cockpit checks, ground operating procedures (as outlined in AN. 01-60FFB-1), taxi, take-off, and climb to the working area and then review any weak points of previous lessons.

1. Clover Leaf:

Explain and demonstrate the procedures used to clear the area and to attain the initial speed. Stress the use of ground references for orientation, and demonstrate the pull-up technique. Show how the roll is initiated slightly before the vertical position is reached. Stress the need for definite seat pressures to be maintained throughout the maneuver and how control pressure must be relaxed and neutralized when needed. Clearly illustrate how four quarter loops and four quarter rolls complete the maneuver, stressing that looking around at all times is necessary to remain cleared and oriented. Have the student practice the clover leaf, and then analyze and correct any errors in his technique.

2. Cuban Eight:

Explain and demonstrate the procedure used to clear the area and attain the initial speed. Stress the use of ground references for orientation and explain and demonstrate the pull-up technique. Demonstrate how the roll is made with a large and rapid application of ailerons. Point out how the rudder is used to hold the point as in the Immelmann. Stress the need for definite seat pressures throughout the maneuver and point out its continuity. Demonstrate how two loops and two rolls complete the maneuver. Have the student practice the cuban eight, analyzing and correcting any errors in his technique.

3. Recovery from Vertical Flight:

Explain and demonstrate the procedure used to clear the area and to attain the initial speed. Demonstrate the technique used for a smooth pull-up, emphasizing the relaxation of back-stick pressure to remain momentarily in vertical flight. Illustrate how the pull-through and roll are incorporated and demonstrate the roll to level flight. Explain that the nose may be lowered below the horizon if needed, during this roll-out. Stress that no negative stick pressure is necessary nor should it be used in this maneuver. Have the student practice the recovery from vertical flight, then analyze and correct any errors in his technique.

C. After the Flight:

1. Hold the critique.
2. Assign the student any pages of the Primary Flying Manual or the supplement which are needed for review.
3. Assign Contact Lesson IX.
4. Grade the student.

CONTACT LESSON IX (Primary)

NIGHT TRANSITION

I. OBJECTIVES:

A. To familiarize you with night flying policies and procedures that pertain to student training and to develop your night flying proficiency.

B. To develop your technique in teaching take-offs, recovery from unusual positions (spiral recovery), traffic-pattern flying, and landing the aircraft at night.

C. At the end of this lesson you should have a thorough knowledge of night flying policies and procedures and be able to teach the proper technique of controlling the aircraft at night in the maneuvers and procedures listed below.

II. MANEUVERS*:

A. Taxiing (Primary Flying Manual, p. 184)

B. Take-Off (P. F. M., p. 182)

C. Landing (P. F. M., p. 183)

D. Traffic Pattern (P. F. M. p. 182)

E. Spiral Recovery (. P. F. M., p. 182)

III. LESSON PROCEDURE:

A. Ground Briefing:

A mass briefing is normally given by the Flight Commander or the Assistant Flight Commander. In this briefing the following specific points will be covered.

1. Statement of the mission, i. e., what is expected of each student.
2. Taxi lanes and runways to be used.
3. Control units and their operation.
4. Ramp and ground radio checks.
5. Radio procedures.
6. Taxiing and landing light procedures.

* Sources of information are found in parenthesis.

7. Take-off.
8. Use of flight instruments to determine attitude and recovery from spirals.
9. Traffic entry and patterns.
10. Landings.
11. Safety precautions.
12. Emergency procedures.
13. Navigational aids, check points, and procedures.
14. Weather (wind condition).
15. Light signals.

You will be responsible for ascertaining that the student:

1. Has completed the blindfold cockpit check.
2. Is proficient in instrument take-offs (hooded).
3. Has in his possession a dependable flashlight.
4. Has been briefed and thoroughly understands all points mentioned above.

B. <u>In the Aircraft:</u>

1. Visual Inspection:

   Have the student perform the visual inspection. In addition, stress the necessity for checking all position lights, cockpit lights and landing lights. Explain that all ground procedures and pre-flight checks are the same as those used during day flights.

2. While Taxiing:

   Stress difficulty of judging speed while taxiing and the necessity for taxiing slowly. Emphasize the importance of being alert. Stress proper use of landing lights. Explain the danger of blinding the pilots of planes on the final approach and taking off.

3. Pre-Take-Off Check:

   Complete pre-take-off check as outlined in the AN. 01-60FFB-1. Explain fire from exhaust stack and stress importance of a tail-low take-off, maintaining attitude, and keeping clear of other aircraft.

4. After the Level-Off at Altitude:

   Point out location of field and how it looks at night. Point out all the aids to navigation and stress importance of keeping oriented at all times.

5. Spiral Recovery, Traffic Descent and Entry:

   Put the aircraft in a spiral and have the student recover to straight and level flight using all available instruments. Upon completion of the spiral, have the student make a normal descent and traffic entry, emphasizing importance of proper spacing when making traffic entry. Be sure to stress keeping clear of other aircraft.

6. Landing and Landing Pattern:

   During the landing phase, have the student practice landings using all possible combinations of landing lights and flood lights. Emphasize the importance of a precise traffic pattern and maintaining proper spacing on other aircraft in the pattern. Point out the importance of applying and holding proper drift correction throughout the pattern and landing. Explain tendency to land on top of the flood lights, haze, ground fog, or smoke, and emphasize the importance of keeping the radio tuned to the proper frequency and staying alert for signals from runway control.

C. After the Flight:

1. Hold the critique.
2. Point out the student's errors.
3. Show him on a map of the local area, all check points observed during the flight.
4. Assign Contact Lesson X.
5. Grade the student.

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CONTACT LESSON X (Primary)

NIGHT NAVIGATION

I. OBJECTIVES:

A. To familiarize you with night flying policies and procedures that pertain to student training on night navigation flights and to develop your proficiency in teaching navigation at night.

B. At the end of this lesson you should have a thorough knowledge of night flying policies and procedures that pertain to student training on night navigation flights. Also, you should have a thorough knowledge of cruise control procedures and know how to teach them.

II. MANEUVERS*:

A. Night Landings and Take-Offs (Primary Flying Manual, pp. 195-210)

B. Night Navigation (P. F. M., pp. 195-210)

III. LESSON PROCEDURE:

A. Ground Briefing:

Ascertain that the student is proficient in night take-offs and landings and check to see that he has in his possession and knows how to use the following:

1. Correct maps.
2. E-6B Computer.
3. Weems plotter.
4. Correct Navigation logs.
5. Radio facility chart.
6. A dependable flashlight.

In addition to the information that is contained in the briefing for Contact Lesson IX, the student should be given the following information:

1. Route of flight.
2. Weather and winds aloft.
3. Procedure to follow if lost.

* Sources of information are found in parenthesis.

4. Information concerning the proposed route.
5. Procedure for departing home station.
6. Cruise control.
7. Procedure for arriving at home station.

B. In the Aircraft:

1. Visual Inspection:

Have the student make a normal visual inspection of the aircraft, stressing proper checking of navigation instruments and lights for proper operation. Point out importance of checking for full fuel service and making sure that all navigational publications are in the aircraft. Taxiing, take-off, climb-out, and level-off should be conducted in the same manner as outlined in Contact Lesson IX.

2. In-Flight and Landing Procedures:

Set up cruise control and depart on course. Explain the importance of following the correct procedure and the importance of setting up cruise control with every change of altitude. Point out navigational aids that the student has not noted on his maps or navigational logs. Demonstrate and have the student make position reports over all turning points. Demonstrate the proper method of letting down and entering traffic at the destination and stress keeping clear of other aircraft. Have the student proceed into traffic, land the aircraft, and taxi to the parking ramp.

C. After the Flight:

1. Hold the critique.

2. Grade the student.

3. Assign Lesson XI.

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Training Project Outlines
for
Pilot Instructor Training
51-105401K
Primary Instrument Lesson Guide

Air Training Command

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026 OLD ACCESSION NUMBER (12AN)

014 MICROFILM REEL/FRAME NUMBER: 0000025995, 001463

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TRAINING PROJECT OUTLINES

for

PILOT INSTRUCTOR TRAINING
COURSE TITLE

51-105401K
COURSE NUMBER

PRIMARY INSTRUMENT LESSON GUIDE
PHASE OR SUBJECT

CMS 69

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FOREWORD

The training project outlines (TPO's) contained in this folder have been designed as student training publications which are intended to supplement the information procedures, and directions given in the student manual, technical orders and / or by the instructor. Each training project outline (TPO) is prepared for a particular "unit of instruction" or "unit of learning" rather than for any specific period of time. Each training project outline (TPO) consists of two "Parts." PART I is the STUDENT STUDY GUIDE and PART II is the STUDENT WORKSHEET.

The PART I - STUDENT STUDY GUIDE contains the necessary technical information required for student study which is not readily available to the student from other sources such as manuals, technical orders, regulations, and other official directives. It also contains specific references to such official publications as well as other specific procedures or data which are subject to frequent change and which, if incorporated in the student manual, would materially reduce the useful life of the student manual. The material referred to and / or included in the PART I of the training project outline (TPO) is normally studied either outside the classroom or during supervised study periods in the classroom. Also included in the PART I are questions which permit self evaluation by the student of the material studied as well as questions which will stimulate classroom discussions.

The PART II - STUDENT WORKSHEET contains the questions to be answered, problems to be solved, and / or work to be accomplished by the student during the classroom activity. It serves as a job sheet, operation sheet, mission card, or excercise to be performed during the classroom or laboratory period. Also included in the PART II are questions which will aid the student in summarizing the main points of the particular project or unit of instruction.

The training project outlines (TPO's) contained in this folder have been prepared primarily for use in the training situations peculiar to the Air Training Command and are subject to frequent revisions which may render the enclosed editions obsolete at an early date. Accordingly, appropriate technical orders and other official directives should be followed when the information and / or procedures contained in such official publications are in conflict with the information and / or procedures contained in the enclosed training project outlines (TPO's).

Informational copies of the training project outlines (TPO's) contained in this folder will be made available in limited quantities to the other major air commands, upon request. Requests for such materials originating in Air Force activities outside the Air Training Command should be forwarded through the major air command headquarters concerned for consolidation of requirements and subsequent forwarding to the Commanding General, Air Training Command.

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INTRODUCTION

The instrument phase of PIS has the primary mission of teaching you how to teach attitude instrument flying. To accomplish this mission, the flight lessons follow the sequence of instrument maneuvers as given in AF manuals 51-36 and 51-37 except for the Instrument Take-Off. This is covered sooner than with the student pilot, since all of you have some background of instrument experience.

Your instructor will place major emphasis on oral presentation (ground and in-flight), demonstration, and error analysis as applied to attitude instrument flying. Your first step toward successful completion of this phase of PIS training will be a comprehensive study and understanding of the material covered in chapter one of AF Manual 51-38, Theory of Instrument Flying.

Each component of attitude instrument flying is of equal importance in developing a qualified instrument pilot. Remember when you are preparing your lessons that your student should have read all available material on the subject that you have assigned him; therefore, your presentation must include more than mere statements of what the primary and supporting instruments are for a particular maneuver. You should explain and/or demonstrate how each instrument can be used in the execution of each maneuver. Try to teach as much technique as possible; do not be satisfied with procedure alone.

Your instructor is here to help you learn how to teach, and he will do everything possible to help you improve your instructing technique.

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TABLE OF CONTENTS

INSTRUMENT LESSON I (Primary)

I. OBJECTIVES:

At the end of this lesson you should:

A. Know how to teach the student to check the operation of all equipment used in instrument flying.

B. Understand and be able to teach the techniques and procedures necessary to make an instrument take-off.

C. Be acquainted with the flight instruments used to control the pitch attitude of an aircraft; be able to interpret the indications of these instruments and explain how they are used to control an aircraft in level flight.

D. Be familiar with the instruments controlling bank attitude; know how to interpret and use their indications to control the banking attitude and be able to teach bank-and-pitch control to produce straight-and-level flight.

E. Have demonstrated your personal instrument flying proficiency.

II. MANEUVERS*:

A. Instrument cockpit check (AFM 51-37, ch. 1, pp. 1-2; AFM 51-38, ch. 1).

B. Instrument Take-Off (AFB 51-37, ch. 1, pp. 24-26; AFM 51-38, ch. 1).

C. Pitch Control (AFM 51-37, ch. 1, pp. 3-10; AFM 51-38, ch. 1).

D. Bank Control (AFM 51-37, ch. 1, pp. 10-15; AFM 51-38, ch. 1).

III. LESSON PROCEDURE:

A. Ground Briefing:

Attitude instrument flying will be discussed. Your instructor will explain any points not clear to you. Knowing the similarity between visual and instrument flight is invaluable when, for any reason, the aircraft's attitude cannot be determined by visual reference to the ground. By

* Sources of information are found in parentheses.

reference to various instruments located within the aircraft, the attitude of of the aircraft can be maintained for any condition of flight. Attitude instrument flying is given complete coverage in AFM 51-37 and AFM 51-38. Listed below are the four main phases of this ground briefing which your instructor will explain and discuss with you.

1. The Instrument Cockpit Check:

All equipment must be carefully checked prior to take-off in order to insure the proper working order of each instrument. During the training period when the student is checking and reporting to the instructor the condition of the instruments, his remarks should be specific, as "The altimeter is set to field elevation and checks with the altimeter setting," and "The turn needle indicates the proper direction of turn" (while the aircraft is taxiing). The use of statements such as "The altimeter is OK" does not tell the instructor whether the student is checking closely or is going hurriedly through the instrument check.

The instrument part of the cockpit check should be given in the following manner:

NAVIGATIONAL PUBLICATIONS - See that latest editions are in the aircraft.

INTERPHONE CHECK - Make sure that you are on inter-phone and not transmitting on the radio.

SUCTION GAGE - Note the exact reading and be sure it is within prescribed limits for proper operation of the suction instruments.

PITOT HEAD - Be sure the pitot head cover is removed and that the pitot head is working properly.

AIR-SPEED INDICATOR - Note the exact reading of the air-speed indicator.

DIRECTIONAL GYRO - Set it with a known runway heading, uncage it and check it with the magnetic compass.

ARTIFICIAL HORIZON - Uncage, adjust the miniature aircraft properly on the hair line and see that the instrument shows the correct attitude of the aircraft while taxiing.

ALTIMETER - Set with the latest altimeter setting and check the reading with the actual field elevation. If an error is present, the altimeter should be set at field elevation and the scale error noted in hundredths of inches. Thereafter, this correction is applied to any new altimeter setting received before setting the instrument.

TURN-AND-BANK INDICATOR - Be sure that the needle is centered when the aircraft is not turning and see that it indicates the proper direction of turn while the aircraft is taxiing. The ball should be free in the race.

VERTICAL-SPEED INDICATOR - Should be indicating zero.

MAGNETIC COMPASS - The bowl should be full of fluid (no bubbles); the compass should swing freely and indicate the correct heading when checked with a known runway heading.

CLOCK - Set to the correct time and check for operation.

CARBURETOR HEAT CONTROL - Place in the full HOT position and check for a temperature rise; then place it in the full COLD position.

OIL COOLER SHUTTERS - Place in the full OPEN position.

ENGINE INSTRUMENTS - Each one should be "in the green" or "coming up."

DE-ICING EQUIPMENT - Be sure it is in the OFF position except during winter when it should be checked for proper operation, adequacy of fluid, etc.

2. Instrument Take-Off:

You should know the proper air speeds and power settings used for take-offs. The proper cross-check during take-off will be emphasized. The proper procedures for making an instrument take-off follow:

Align the aircraft with the runway and set the directional gyro with runway heading. Holding the brakes, smoothly advance the throttle and as the RPM passes through 1000-1200 RPM, release the brakes and continue to advance the throttle to the sea-level stop. Point out that the directional gyro is primary for directional control until the aircraft is airborne. When elevator control becomes effective, establish the take-off attitude on the artificial horizon. The artificial horizon then becomes primary for both pitch-and-bank control. This attitude should be approximately the same as the 3-point attitude while taxiing and should

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be maintained until the aircraft is airborne. The aircraft is not considered airborne until the altimeter and vertical speed indicate a climb. When the aircraft is airborne the directional gyro becomes primary for bank and the vertical speed becomes primary for pitch as it approaches 500' per minute. The artificial horizon is used as an aid for supporting both pitch and bank. When the aircraft is airborne, retract the gear. The air speed should increase steadily until the climbing air speed is reached. Then use the cross-check and control techniques for a normal climb. Make the first power reduction when a safe air speed is reached.

3. Pitch Control:

Your instructor will explain how the artificial horizon, the altimeter, vertical-speed indicator, and the air-speed indicator show the pitch attitude of the aircraft. He will also explain how good pitch-control technique is dependent upon accurate interpretation of the instruments and small corrections of pitch attitude. Further explanation will show how proper application of elevator trim is an integral part of pitch control, and that good technique is very difficult without it.

The proper cross-check of pitch instruments is the process of reading and interpreting the flight instruments to determine the attitude of the aircraft. The primary instrument is always the instrument that gives the most pertinent information for any particular maneuver and is usually the one that should be held at a constant indication. There are times when a supporting instrument is used almost as much as a primary instrument. For example, the artificial horizon is used to make any pitch corrections indicated by the altimeter and to hold constant any desired attitude.

4. Bank Control:

Your instructor will explain how the artificial horizon, the directional gyro, and the turn needle show the bank attitude of the aircraft. He will tell you why accurate interpretation of the indications of the bank instruments is essential. Errors in bank attitude should be noted quickly so that corrections will be small. He will explain why proper application of rudder and aileron trim is essential to good bank-control technique.

Cross-check between bank instruments only and then both bank-and-pitch instruments will be discussed. If more than one instrument to show bank is present, a continuous cross-check is necessary to insure accurate control and to correct any errors that may be present in any of the instruments. In bank as in pitch there is always a primary instrument. It is the one that should be stationary during the maneuver performed. In straight flight the directional gyro should not move, therefore, it is the primary instrument. If it is not available the turn needle should be stationary and become the primary instrument.

When bank-and-pitch control are combined, two instruments are primary. for example, in straight-and-level flight with all instruments available, the directional gyro and the altimeter are used to hold a constant heading and attitude. Combining bank-and-pitch control also requires a more rapid cross-check, and interpretations must be very accurate. The cross-check should always be as rapid and accurate as possible, even in simple maneuvers. This develops the student's ability to cross check and allows him to direct more attention to other matters in the basic phase.

B. In the Aircraft:

Your instructor will demonstrate and/or have you perform the functions, procedure and/or maneuvers connected with the following four separate phases of this lesson.

1. Instrument Cockpit Check:

Make the cockpit check of all flight instruments and equipment needed for the flight. Give the check to the instructor over the interphone while taxiing out. Make a definite check of all radio equipment prior to take-off.

2. Instrument Take-Off:

The aircraft should be at a complete stop when giving the student the controls. The directional gyro will be set on the runway heading and fully uncaged. Application of throttle will be one continuous movement. Your use of trim will be noted throughout the take-off.

The instrument take-off pitch attitude is actually a tail-low attitude and not 3-point. Because of acceleration error in the instrument, a 3-point indication will give the tail-low attitude. The first turn out of traffic will be at 1000' indicated and the initial level off will be at the discretion of the instructor. For the purpose of power reduction, the air speed is considered to be safe as soon as the gear is retracted and the air speed is steadily increasing. Turns out of traffic should be used to obtain an approximate calibration of the turn needle. Excessive oral presentation should be avoided while the instrument take-off is being made.

3. Pitch Control:

Pitch control can best be explained by referring separately to the different instruments and controls used.

a. The Artificial Horizon:

In demonstrating the characteristics and uses of the artificial horizon, your instructor will show you the similarity between the artificial horizon and natural horizon by placing the nose of the aircraft first above and then below the horizon and showing how the natural and artifical horizons give the same indication. He will show the loss of indication when the limits of an instrument are exceeded, by raising the nose of the aircraft until the artificial horizon "spills." (This maneuver may be omitted if it is prohibited in the aircraft being used.) After "spilling" the instrument, any attitude indication shown is unreliable. He will point out the need for level flight when uncaging the artificial horizon by placing the aircraft in a climbing attitude and having you cage and uncage the artificial horizon. He will return to level flight and point out the false reading of the instrument.

The acceleration and deceleration error of the artificial horizon will be shown by increasing power rapidly from low to high power and pointing out the loss of altitude even though the artificial horizon indicates a constant level attitude. By attaining a high cruising speed and retarding the throttle rapidly to low power, your instructor will point out the gain in altitude even though the artificial horizon indicates a constant level attitude. By keeping a constant altitude during power changes, he will show how the horizon bar moves downward on acceleration and upwards on deceleration. NOTE: If the artificial horizon is new, these errors might be difficult to notice; however, the more worn the instrument becomes the more prominent the error.

Your instructor will show you a comparison of movements of the miniature aircraft in the artificial horizon with the actual movement of the nose of the aircraft as it appears on the actual horizon. He will do this by (1) keeping the aircraft level at normal cruising and having you adjust the miniature aircraft so that its wings exactly overlap the horizon bar; and then by (2) changing the pitch attitude so that the horizon bar indicates a climb of 1/2 the width of the horizon bar; he'll have you compare this movement to the actual movement of the nose of the aircraft as it appears on the actual horizon. By repeating the demonstration (indicating a descent) he will show that normally, if the aircraft is near the desired attitude, any pitch change exceeding this amount is an indication of overcontrolling.

You will then practice pitch control by using the artificial horizon. In this practice you will maintain level flight (1) by keeping the wings of the miniature aircraft centered exactly on the artificial horizon bar and (2) by making small changes in pitch, effecting a movement of not more than 1/2 the width of the horizon bar. Your instructor will occasionally place the aircraft in a steep climb or steep descent and have you return to level flight. He will have you make sure that your control pressure is smooth and that you are not overcontrolling.

b. The Altimeter:

In any demonstration of the characteristics and uses of the altimeter there are four factors to be considered. Each of four is listed and explained separately as follows:

First, constant altitude: You instructor will show you that to maintain a constant altitude with a given power setting in level flight, the pitch attitude must also remain constant. He will then change the pitch attitude until the altimeter indicates a climb or descent and point out to you this change of pitch attitude. If altitude is being gained, the nose of the aircraft is too high and should be lowered, and if altitude is being lost, the nose is too low and should be raised to return to level flight.

Second, determining pitch attitude: Your instructor will raise the nose of the aircraft until the miniature aircraft of the artificial horizon is well above the horizon bar. He will point out that the altimeter is changing rapidly as is the pitch attitude shown on the artificial horizon. He will make a small change in pitch attitude and point out the corresponding slow change in altitude as indicated on the altimeter. By interpolating the rate of movement of the altimeter you can visualize the approximate change in pitch attitude.

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Third, lag in the altimeter: Your instructor will demonstrate this by making an abrupt change in pitch attitude of the aircraft and pointing out the momentary lag in the altimeter. He will then make a small, slow change in pitch attitude to show that the lag is not apparent and explain that even though there is a small lag in the indications of the altimeter, for all practical purposes it can be considered as giving an immediate indication of a change in pitch attitude. (Control technique determines the lag.)

Fourth, cross-check between the altimeter and artificial horizon: To control the pitch attitude of the aircraft properly by using both the artificial horizon and the altimeter, a system of cross-checking must be developed. With only two instruments at this stage of instruction, the cross-check consists of merely looking from one instrument to the other. Changes in pitch are made in order to keep the altitude constant.

Your instructor will have you practice using the altimeter by keeping the altitude constant. When you are able to control the pitch attitude by using only the altimeter, then maintain level flight using the artificial horizon and the altimeter. You will practice further losing or gaining 50 feet of altitude by changing the pitch attitude not more than 1/2 the width of the horizon bar. Your instructor will emphasize the use of a small change in the pitch attitude. Return to the proper altitude and repeat this exercise until you are capable of cross checking the two instruments and have acquired the proper control technique.

c. The Vertical-Speed Indicator:

In demonstrating the characteristics and uses of the vertical-speed indicator your instructor will show you its use in level flight. First observe the vertical-speed indicator and then the remaining pitch instruments as small changes in pitch attitude are made. Your attention will be called to the immediate change in the indication of vertical speed and how this indication is used to determine the need for a pitch correction.

He will then show you how to use the vertical-speed indicator in a descent. While in level flight, he will make a large change in pitch attitude so that the aircraft is diving. While the vertical-speed indicator gives an immediate indication of a change in pitch attitude, a short time elapses before it settles down and indicates the actual rate of descent. The value of the vertical-speed indicator and the fact that the instrument should not be "chased" will be stressed. You will see the necessity for making small corrections and then waiting for the instrument to settle down. (NOTE: Control technique has a definite effect on the indications. An abrupt pitch change will cause excess movement of the needle. This excess movement may be reduced to a minimum with a smooth, positive pressure control technique.) From level flight he will dive the aircraft, making a large change in the pitch attitude. While the vertical speed is rapidly increasing in a descent, he will pull up into a climb, making another large change in the pitch attitude. You will notice almost immediately the vertical speed reverses its direction of movement and begins to move rapidly upwards, indicating a change in the pitch attitude.

Your instructor will show you how to use the vertical-speed indicator to correct for deviations in altitude. From level flight he will raise the nose of the aircraft so that the artificial horizon indicates a 1/2 bar width climb. A change in pitch of this magnitude indicates a vertical speed of about 200-300 fpm. (The relation between the artificial horizon and vertical-speed indicator depends upon the air speed. For example, at 450 mph a 1/2 bar movement of the artificial horizon might indicate a climb of as much as 2,500 fpm. The relation, therefore, is for low-speed flight.) A pitch change resulting in a rate of more than this amount is an indication of overcontrolling when the altitude is near that desired. He will repeat the demonstration in a descent. He will level off 50 feet below the desired altitude and show you that in order to correct to the desired altitude, a climb of 200 fpm should be established.

He will show you the cross-check of the three pitch instruments studied thus far by resuming a level-flight attitude at the desired altitude. A cross-check of the three pitch instruments is made to detect a deviation in altitude. The vertical-speed indicator is added to the sequence of the pitch attitude cross-check previously described, and any deviation from the zero indication shows the need for a change in pitch attitude. (NOTE: Vertical speed gives first indication of a change in pitch attitude.) He will call attention further to cross check by placing the aircraft in a descent of 100 fpm and show you that the vertical-speed indicator indicates the change in pitch attitude faster than the altimeter and that this indication is easier to detect than the movement of the horizon bar. He will descend to 50 feet below the altitude desired and enter a climb of 200 fpm to return to the proper altitude. During the few seconds required to climb the 50 feet, the vertical-speed indicator is the primary pitch instrument. The artificial horizon is cross checked rapidly for approximately the correct position, and the altimeter is cross checked to determine when the level-off should be started. The cross-check must be rapid. He will repeat the demonstration and show you how to correct for a gain in altitude.

Your instructor will have you practice pitch control by keeping the vertical-speed indicator on zero. After you are able to keep the vertical-speed indicator zerod without overcontrolling, enter a climb of 200 fpm and gain 100 feet of altitude. Then resume level flight and descend at 200 fpm to the desired altitude. Cross check the altimeter, the artificial horizon, and the vertical-speed indicator while maintaining level flight. Make sure that you exert the proper corrective pressures to return to the specified altitude when you deviate from the desired altitude. Your instructor will emphasize precision.

d. The Air-Speed Indicator:

To demonstrate the characteristics and uses of the air-speed indicator, your instructor will show you its use in determining attitude. He will do this by first, using a constant power setting in level flight, pointing out that when the altitude is constant, the air speed remains constant; then by making small changes in pitch attitude and having you notice the slow changes in air speed, and finally by making extreme changes in pitch attitude and pointing out the fast changes in air speed. He will show the apparent lag in the air-speed indicator by making short climbs and dives. This lag is caused by the time required for the aircraft to accelerate or decelerate after the pitch attitude has been changed. There is no appreciable lag incorporated in the design of this instrument. He will show you how to include the air-speed indicator in the cross-check. He will explain that the air-speed indicator is placed in the cross-checking sequence in the same way as for the previous combination of the artificial horizon, the altimeter, and the vertical-speed indicator. As each instrument is added to the cross-check, speed of the cross checking must be increased to afford adequate coverage of all available instruments.

Now practice pitch control with a constant power setting and holding a constant speed in level flight using first the air-speed indicator alone, and then all available pitch instruments.

e. Elevator Trim:

Your instructor will demonstrate elevator trim by showing application of elevator trim in pitch control. He will make sure that the aircraft is not trimmed properly and place it in level flight. He will point out that pressure on the stick is necessary to hold the desired pitch attitude and by adjusting the elevator trim to relieve this pressure, will show you how the aircraft will fly "hands off." In level flight, he will change the air speed and show how it is necessary first to hold pressure on the stick and then to relieve this pressure with elevator trim. He will have you practice flying level while he makes various power changes, first with all available instruments and then without the artificial horizon. (NOTE: Your instructor will aid in rudder and bank control.)

Additional practice will be given for you to improve your cross-check. You should be absolutely sure that you are properly cross checking all available pitch instruments. Your instructor will re-emphasize some of the ground briefing to impress you with the need for a rapid cross-checking. The quicker you notice a deviation, the smaller the amount of control pressure necessary to counteract the deviation. In level flight the altimeter and vertical-speed indicator relationship must be used to control the pitch in order to keep the altitude constant.

Practice pitch control in level flight. If you or your future students are weak on pitch control practice "open hood" until the trouble has been eliminated. If progress is satisfactory, practice under the hood. Your instructor will make various power changes and have you practice pitch control, first with all available pitch instruments, and then without the artificial horizon.

You will proceed immediately to another maneuver or another combination of instruments as soon as you are proficient. Your success in instrument flying depends upon you becoming proficient in all combinations of instruments before advancing to another lesson.

4. Bank Control:

As in pitch control, for purposes of clarity, bank control is best explained by referring separately to the different instruments and controls used.

a. The Artificial Horizon:

Your instructor will demonstrate the characteristics and uses of the artificial horizon by showing the similarity between the artificial and natural horizons in the banking plane. He will take control of the aircraft and have you watch the real horizon and the artificial horizon as the aircraft is rolled from one bank to the other. He will also point out the similarity between the movement of the miniature aircraft and the real aircraft. The horizon bar is parallel to the actual horizon, and any attitude of the real aircraft is indicated instantly on the artificial horizon. To aid your understanding of this principle, imagine yourself in the miniature aircraft. Proper control of the miniature aircraft insures proper control of the actual aircraft. He will point out the banking scale at the top of the instrument and, by rolling from one bank to another, show how the pointer indicates the degree of bank.

In showing the limits of the artificial horizon in the banking attitude, he will demonstrate how the horizon tumbles when its limits are exceeded and will not be usable for a considerable length of time. (If this maneuver is prohibited in the type of aircraft being used, it may be eliminated.)

He will place the aircraft in a bank and have you cage and uncage the artificial horizon. He will return the wings of the aircraft to level flight and point out that the instrument indicates a bank. He will then place the aircraft in a 20° to 30° bank, have you cage and uncage the artificial horizon, then have you take control and endeavor to keep the miniatur aircraft level on the horizon bar. Note the dangerous maneuver this causes. The importance of uncaging the artificial horizon in level flight will be stressed. If the instrument is not fully uncaged it may tumble with only a medium bank.

Your instructor will show precession of the horizon bar by making a steep turn of 180° and pointing out that a different position of the miniature aircraft is necessary to maintain straight-and-level flight because of the precession of the horizon bar in the turn. The steep turn is used to make the error more apparent.

The banking attitude that is shown on the artificial horizon is now combined with the cross-checking system that is used for pitch control. When the artificial horizon is cross-checked, both pitch attitude and bank attitude should be checked at the same time.

In giving you an opportunity to practice bank control with the artificial horizon, your instructor will occasionally place the aircraft in a bank and have you return the wings to level flight. You will practice pitch-and-bank control using the artificial horizon, the air-speed indicator, the altimeter, and the vertical-speed indicator to produce straight-and-level flight.

b. The Directional Gyro:

Your instructor will demonstrate the characteristics and uses of the directional gyro in banks and turns. Turning means banking in coordinated flight; therefore, the directional gyro gives an indirect indication of bank. Your instructor will roll the aircraft into a very shallow bank and point out that the directional gyro moves slowly in the direction of bank. He will increase the bank and point out the corresponding increase in the rate of turn on the directional gyro. The directional gyro always gives exact headings and has no turn error.

In setting the directional gyro, remember that since it has no direction-seeking qualities, it must be adjusted to magnetic headings. This is done with the aircraft in straight-and-level flight.

When the actual heading deviates from the desired heading, the aircraft is returned to the proper heading by the use of a bank which should not exceed the number of degrees to be turned. When large changes in heading are to be made, the angle of bank should not exceed that for a standard-rate turn. Your instructor will demonstrate the limits of the directional gyro by exceeding its limits first in the pitch attitude, then in the banking attitude. (All headings are generally considered to have 55° of pitch or bank.) You will note the resultant indications. When the limits of either pitch or bank are exceeded, the directional gyro is not to be relied upon because it may tumble. (Occasionally the directional gyro may give correct indications even though its limits are exceeded.)

The directional gyro in the cross-checking system will be explained by your instructor. The directional gyro is now added to the cross-checking system being used to maintain straight-and-level flight. The directional gyro, when available, is always the primary instrument for bank control in straight flight.

You will practice bank control, at first using the directional gyro and the artificial horizon to produce straight flight, and then using all instruments except the needle and ball to produce straight flight.

c. The Turn Needle:

Your instructor will demonstrate the characteristics and uses of the turn needle in banks and turns by rolling from one bank to another to show how the needle indicates indirectly the banking attitude of the aircraft. At the same time, you should remember that when the aircraft is banked, it is also turning. This turn is indicated on the turn needle. When the turn needle is exactly centered (with proper trim), it indicates straight flight with the wings level. By reference to the artificial horizon, he will place the aircraft in a very shallow bank (approximately 2°) and point out the minute deflection of the turn needle. He will also point out the corresponding slow movement of the directional gyro. The importance of keeping the turn needle exactly centered to maintain straight flight will be emphasized.

The turn needle is now added to the cross-checking system that is being used to maintain straight-and-level flight. When the directional gyro is not available, the turn needle is of primary importance for bank control to maintain straight flight.

Now practice bank control using first the turn needle and then a combination of all the instruments with the exception of the ball instrument.

d. The Ball Instrument:

In demonstrating the characteristics and uses of the ball instrument, your instructor will show you how the ball is used to determine whether or not the correct rudder pressure or rudder trim is being used. While in straight-and-level flight he will adjust the rudder trim (holding the wings level) until the aircraft is in a skid. This is indicated by the ball's being displaced from center. Note that the ball can then be recentered by applying rudder pressure on the side to which the ball has been displaced. Then relieve the rudder pressure by adjusting the rudder trim. The importance of keeping the aircraft properly trimmed at all times will be stressed. Your instructor will have you practice rudder trim by occasionally changing the trim so that the ball is not centered and have you re-center the ball with rudder pressure. Relieve this pressure with rudder trim.

Additional practice will be given in straight-and-level flight, first visually and then under the hood with all available instruments, then, without the directional gyro, next without the artificial horizon, and finally without the artificial horizon and the directional gyro. Your instructor will emphasize cross-checking and point out that control of the aircraft is easy if the instruments are cross-checked rapidly and their indications are properly interpreted. He will emphasize the use of trim. He will make changes in power settings and have you maintain straight-and-level flight by keeping the aircraft trimmed properly.

C. After the Flight:

Your instructor will review your errors and point out your weak points; discuss the flight and error analysis and show its application to cadet training, and assign the next lesson if you have completed this one satisfactorily.

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TPO-C-105401K-IF-2
May 1952

INSTRUMENT LESSON II (Primary)

I. OBJECTIVES:

At the end of this lesson you should:

A. Have a thorough understanding of the maneuvers and procedures listed below.

B. Be able to give an oral presentation and demonstration of these maneuvers and procedures.

II. MANEUVERS*:

A. Power Control, rudder-elevator trim control (AFM 51-37, ch. 1, pp. 16-17, AFM 51-38, ch. 2)

B. Straight climbs and descents (AFM 51-37, ch. 1, pp. 17-24; AFM 51-38, ch. 2)

C. Turns (AFM 51-37, ch. 1, pp. 26-29; AFM 51-38, ch. 2).

D. Turns to directional gyro headings (AFM 51-37, ch. 1, pp. 33-34).

III. LESSON PROCEDURE:

A. Ground Briefing:

The four phases of the ground briefing in this lesson are listed below.

1. Power Control and Rudder-Elevator Trim:

Your instructor will explain power control and rudder-elevator trim. Power changes which definitely affect the attitude of an aircraft require control pressures to maintain a constant attitude. These pressures are relieved by proper application of elevator and rudder trim. He will explain the proper technique for changing air speed while in straight-and-level flight and point out the correct power settings for various air speeds.

* Sources of information are found in parentheses.

Basically, the cross-check between pitch, bank, and power control instruments is the same as that previously used for pitch-and-bank control only. The altimeter remains the primary instrument for pitch control, and the directional gyro (or turn needle when the directional gyro is not available) is used for bank control. In most maneuvers the air-speed indicator is the primary instrument for power control. The manifold pressure gage is used to aid in making the desired changes. The speed of the cross-check must be increased when power changes are made, since changing the power tends to change the attitude of the aircraft.

2. Straight Climbs and Descents:

Be prepared to explain the proper procedure for entering climbs and descents from cruising, climbing and descending air speed. Explain further the proper procedure for leveling off from climbs and descents at cruising, climbing, and descending air speed, and the proper air speeds and power settings for climbs and descents.

3. Turns:

Give an explanation of a properly coordinated turn, aileron drag, effects of slips and skids, and turns in climbs and descents.

4. Turns to Directional Gyro Headings:

Be prepared to explain the proper procedure and technique used in making turns to directional gyro headings.

B. <u>In the Aircraft:</u>

Before beginning the four new phases of this lesson as listed below, you will be expected to demonstrate the instrument cockpit check and will practice making an instrument take-off.

1. Power Control and Rudder-Elevator Trim:

You will demonstrate elevator-rudder trim with power changes. Show the effect of power changes on pitch attitude and trim technique. While in level flight with the aircraft properly trimmed, apply power and point out that the aircraft will go into a nose-high attitude. Forward pressure on the elevator control is necessary to maintain a constant altitude and elevator trim is used to relieve this pressure. Now decrease the power and point out that the aircraft will go into a nose-low attitude. Back pressure and elevator trim must be used to maintain a constant altitude.

Show the torque effect when changing power. Increase power but maintain a constant altitude and point out the resultant yaw to the left. Decrease the power and point out the yaw to the right. In both cases the need for rudder trim is indicated by the ball instrument. In multi-engine aircraft, torque is negligible but is still present. Torque is not present in jet aircraft.

Show the effect of power on pitch and bank. With the aircraft trimmed for straight-and-level flight, apply power and show that the nose will rise and go to the left. Reduce power and show the movement of the nose to the right and below the horizon. Demonstrate how smooth application of power has different effects on pitch-and-bank attitude.

Practice trim control by making large, smooth and abrupt changes in power and practice trim control in straight-and-level flight. Emphasize at this time that the hand should be resting on the trim-tab controls at all times except when actually changing power setting.

Demonstrate changes of air speed. First show how to decrease air speed properly. Reduce the manifold pressure approximately 3 to 5 in. Hg below the power setting needed for low cruising air speed, stressing the fact that the throttle should be moved smoothly and accurately in all power changes. The manifold pressure gage should not be observed until the throttle has been moved approximately to the desired position. At this time it is brought into the cross-check to make accurate adjustment. Re-emphasize the need for proper rudder and elevator trim to aid in maintaining the desired bank-and-pitch attitude, because the pressure on the controls changes as the power is changed. Point out that the pitch attitude must be changed to hold a constant altitude as the air speed changes. Remember the acceleration and deceleration errors of the artificial horizon. The air-speed indicator remains the primary power instrument, and as it approaches low cruising air speed (within 2-3 mph) the power should be increased to the setting that will maintain this air speed in level flight. When this adjustment has been made, using the manifold pressure gage, the air speed must be checked to see if the power setting is correct.

Now show how to increase the air speed. Demonstrate an increase in air speed to normal cruise by increasing the manifold pressure 3 to 5 in. Hg above the power setting needed for normal cruise. When the desired air speed is approached (within

2-3 mph), adjust the power to maintain this air speed. The same control technique which is used for decreasing air speed is also used for increasing air speed.

Demonstrate control of altitude and air speed in straight-and-level flight. While maintaining straight-and-level flight, it is important that an exact altitude and air speed be maintained with pitch control and air speed is maintained with power control. The need for a power or pitch change is indicated by a cross-check between the air-speed indicator and the altimeter. When the altitude is correct and the air speed is either high or low, a power change is needed to attain the desired air speed. When the altitude is low and the air speed is high (or when the air speed is low and the altitude is high), only a change in pitch attitude may be needed to attain the desired altitude and air speed. When both the altitude and the air speed are high (or low) a change in both pitch and power is needed. Now practice your cross-check combining pitch, bank, and power instruments. The cross-check of the pitch and the bank instruments to produce straight-and-level flight is now combined with the instruments that control power. The altimeter is the primary instrument for pitch control and the directional gyro (turn needle when the directional gyro is not available) is the primary instrument for bank control throughout the lesson. During power changes the speed of cross-check must be increased to cover the pitch-and-bank instruments adequately and counteract any deviations indicated.

Practice changing power and air speed in straight-and-level flight:

a. With all available pitch-and-bank instruments.

b. Without the directional gyro.

c. Without the directional gyro and the artificial horizon.

2. Straight Climbs and Descents:

Demonstrate climbs from level flight at cruising air speed. Enter a straight climb, and during the entry, point out that as the power is increased to the proper setting, the aircraft starts to climb; thus, only a slight adjustment in pitch is necessary to establish the proper climbing attitude. The initial pitch attitude is established by reference to the artificial horizon. As soon as this attitude is established, the vertical-speed indicator will show a climb. It becomes the primary pitch instrument until air speed decreases to climbing speed. Then the airspeed is primary for pitch control.

After establishing a constant air-speed climb, change the pitch attitude so that air speed is first 5 mph below and then 5 mph above that desired, thus showing how the vertical-speed indicator is used to adjust the pitch attitude to regain the desired air speed. Emphasize the use of small, smooth corrections in pitch attitude (not to exceed 200 fpm on the vertical-speed indicator for the initial correction). In the climb, as in level flight, the vertical-speed indicator is used to aid in pitch control. Level off at a predetermined altitude at cruising air speed. Point out the proper amount of lead to be used. As soon as the level-off is started, the altimeter is the primary pitch instrument. The approximate level-flight attitude is established on the artificial horizon, and the altimeter cross-checked to determine the adequacy of the pitch change; then the normal level flight cross-check is used. Since cruising air speed is desired, the power is set 3 to 5 in. Hg above cruising power setting and as the desired speed is obtained, the power is reduced to cruising manifold pressure. During the level-off, emphasize the need for prompt use of trim and smoothness of control pressure. Now practice entering straight climbs from cruising air speed, constant air-speed climbs, and level-offs at cruising air speed. Do this first with all available instruments and later without the artificial horizon and the directional gyro.

Demonstrate the entry to a straight climb from climbing air speed. Emphasize that as the power is increased to climbing manifold pressure, the air speed immediately becomes the primary pitch instrument. Level off at a predetermined altitude at climbing air speed as was used to level off at cruising air speed. The level-off requires a coordinated change in power and pitch. The power is reduced to the manifold pressure which will maintain level flight at climbing air speed. When the level-off is started the altimeter becomes the primary pitch instrument and the normal straight-and-level method of cross-checking is used. Re-emphasize the use of trim. Now practice entering straight climbs from climbing air speed, constant air speed climbs, and level-offs from climbs at climbing air speed. Do this first with all available instruments, and then without the artificial horizon and directional gyro.

Now demonstrate descents. During the basic phase of instrument training, descents are usually started from descending air speed. In your entry into a descent, reduce power to descending manifold pressure, maintaining a constant altitude until the air speed reaches descending speed. The altimeter is the primary pitch instrument until the air speed reaches descending speed; then the air-speed indicator becomes the primary pitch instrument and the pitch attitude is adjusted to maintain a constant descending air speed. Emphasize proper rudder and elevator trim during this maneuver. During the descent, change the pitch attitude so that the air speed is first 5 mph above and then 5 mph below that desired and show how the vertical-speed indicator is used to regain the desired air speed.

The same control technique used for climbs is also used for descents. Show the exact altitude at which the level-off is started, and level off at a predetermined altitude at descending air speed. As soon as this altitude is reached, the level-off is accomplished by increasing the power to the manifold pressure [illegible] to maintain level flight at descending air speed. Point out the need for retrimming the aircraft for level flight. As soon as the power is applied, the altimeter becomes the primary pitch instrument and the normal straight-and-level cross-check is used.

Demonstrate how to level off at cruising air speed. [illegible] the approximate amount of lead (150') that is necessary to allow the air speed to increase to cruising air speed by the time the desired altitude is reached. When the power is added, the vertical-speed indicator becomes the primary pitch instrument. It should remain constant until a point is reached where the nose must be raised to reduce the vertical-speed indicator to zero at the instant the altitude is reached. The altimeter then becomes the primary pitch instrument. Trim must be used in this maneuver since the aircraft tends to level off as soon as power is added.

Now practice descent entries and descent level-offs at descending and cruising air speed, with all available instruments, and then without the artificial horizon and directional gyro.

3. Turns.

Demonstrate turns at cruising air speed. Make an entry into a standard-rate turn at cruising air speed. Point out the steady coordinated pressures exerted on the aileron and rudder. Because of the loss of vertical lift when the aircraft is in a bank, the pitch attitude must be changed to maintain a constant altitude. Corrective control pressures should be applied only when the flight instruments indicate a deviation from the desired conditions of flight. The altimeter is the primary instrument indicating pitch attitude. Other primary instruments are these: air-speed indicator for power control and artificial horizon for bank control (needle and ball when the artificial horizon is not available). The method of cross-checking is basically the same as that used for straight-and-level flight. When the desired angle of bank is reached, it is necessary to exert a slight pressure on the aileron and rudder opposite to the direction of turn in order to prevent the bank from increasing. The importance of maintaining an exact angle of bank should be emphasized. The power is adjusted to hold a constant air speed. Point out the angle of bank necessary to maintain a standard-rate turn. The angle of bank needed for a standard-rate turn varies with the true air speed. Recover from the turn and point out that the control technique and method of cross-checking used for the roll-in are used for the roll-out.

The accompanying table gives the angle of bank for a standard-rate turn at varying air speeds:

Air Speed mph (true)	Angle of bank for 3^{o}/sec. turn	$1\ 1/2^{o}$/sec. turn
100	13.5	6.8
125	16.7	8.5
150	19.8	10.2
175	22.8	11.8
200	25.6	13.5
225	28.4	15.1
250	30.1	16.7
300	35.7	19.8
350	40.0	22.8
400	43.8	25.6
500	50.2	30.1

Now demonstrate turns at low cruising air speed.

Roll into a bank at a low cruising air speed and point out the angle of bank necessary to maintain a standard-rate turn. Now perform the same maneuver at high cruising speed.

Demonstrate a turn entry by the use of rudder alone. Point out the resulting skid and displacement of the ball and the decrease in air speed. Both are undesirable. Show that the aircraft is turning faster than the angle of bank indicates.

Show a turn entry using aileron alone. Point out the yaw caused by aileron drag, and show how the coordinated use of rudder and ailerons eliminates its effect. Aileron drag is more noticeable at low air speeds and with positive use of the ailerons. When correcting for a slip or skid, the angle of bank will have to be changed to maintain a constant rate of turn. Demonstrate climbing turns, and in your demonstration point out that the technique used to control the banking attitude in a level turn and the technique used to control the pitch attitude in a straight climb are used simultaneously during the entry. Emphasize that the airspeed and vertical-speed combination is the primary indication for pitch control and that the artificial horizon (or if not available, the turn-and-bank indicator) is the primary instrument for bank control. The manifold pressure gage is the primary instrument for power control throughout the maneuver. The pitch attitude needed in a climbing turn is slightly lower than that needed for a straight climb because of the loss of lift in a banking attitude. Roll out at the desired altitude, using a combination of the control technique used for leveling off from climbs.

Now demonstrate descending turns and point out that the same technique used for climbing turns is used for descending turns. Then practice turns (not to exceed standard rate), first visually and then hooded. Do this with all available instruments, and then without the artificial horizon.

4. Turns to Directional Gyro Headings.

You will demonstrate turns to directional gyro headings. Enter a standard-rate turn and emphasize that a smooth, coordinated entry aids in pitch-and-bank control. Since the aircraft will continue to turn as long as the wings are banked, show that the roll-out must be started before reaching the desired heading. Roll out on the desired heading and point out that a lead of 1^{o} for every 2^{o} (see AF Manual 51-37) of bank being held is used. During the roll-out emphasize smoothness and coordination. Show the proper amount of bank required to change the heading of the aircraft from 20^{o} to 45^{o} when the artificial horizon is not available, using caution not to overbank. The amount of lead is computed in the same manner as previously mentioned. Now show the proper amount of bank required when the change in heading is less than 20^{o}. (NOTE: Your instructor will show you why the angle of bank should not exceed the number of degrees to be turned when the artificial horizon is available.)

Now practice turns to directional gyro headings which require a standard-rate turn, a 2/3 rate turn, and a 1/3 rate turn. Do this with all available instruments, and then without the artificial horizon.

Now, give attention to some additional practice. BE SURE THAT YOU DO NOT SPEND SO MUCH TIME ON THE PRIMARY INSTRUMENTS THAT YOU LOSE SIGHT OF THE IMPORTANT INFORMATION PRESENTED BY THE OTHER INSTRUMENTS. DIVIDE YOUR ATTENTION! Try changing your air speed and practice constant-rate descent.

C. After the Flight:

Your instructor will review your errors and point out your weak points; discuss the flight and error analysis and show its application to cadet training; and assign the next lesson if you have completed this one satisfactorily.

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TPO-C-105401K-IF-3
May 1952

INSTRUMENT LESSON III (Primary)

I. OBJECTIVES:

At the end of this lesson you should be able to give an oral presentation and demonstration of the maneuvers and procedures listed below:

II. MANEUVERS*:

A. Instrument Take-Off (AFM 51-37, ch. 1, pp. 24-26; AFM 51-38, ch. 1; Primary Instrument Lesson No. 1).

B. Climbs and Descents at a definite rate (indicated and absolute)(AFM 51-37, ch. 1, pp. 29-31).

C. Vertical S and Vertical S-1 (AFM 51-37, ch. 1, pp. 31-32).

D. VHF/DF procedure (See Inclosure #1 to this TPO).

E. Ground-Controlled Approach (AFM 51-37, ch. 1, pp. 35-39).

III. LESSON PROCEDURE:

A. Ground Briefing:

Review the instrument take-off and explain the four additional maneuvers listed below:

1. Instrument Take-Off:

You should know the proper air speeds and power settings used for take-offs. Stress the proper cross-check used during take-off. Explain the procedures for making an instrument take-off.

2. Climbs and Descents at a Definite Rate - Indicated and Absolute:

You will explain that all climbs and descents at a definite indicated or absolute rate are entered at climbing or descending air speed. You should understand and explain how to cross check the altimeter and clock to determine the absolute rate of climb or descent and explain the procedure and technique to be used when making climbs and descents at a definite rate.

* Sources of information are shown in parentheses.

3. Vertical S and Vertical S-1:

Explain the procedure, control technique, and cross-check used in the Vertical S. Explain the procedure, control technique and cross-check used in the Vertical S-1.

4. VHF/DF Procedure:

Be able to explain the procedure listed in Inclosure #1 to this TPO.

5. Ground-Controlled Approach (GCA):

Discuss the correct power settings, air speeds, and flap settings for a GCA. Explain the procedures, including voice procedure, and technique used to effect a GCA. The rectangular GCA traffic pattern is used during training, but under actual conditions, the type of pattern is determined by the physical set-up of the field and the instructions given by Approach Control. Regardless of the type of pattern flown, all GCA approaches will include four phases: initial approach, final approach, pre-landing, and touchdown or landing roll.

B. <u>In the Aircraft:</u>

Listed below are five separate procedures and/or maneuvers which you should be prepared to present or practice as noted.

1. Instrument Cockpit Check and Instrument Take-Off:

Your instructor will give the instrument cockpit check. You correct any mistakes made by your instructor. Make certain your instructor covers all items listed on the check list. Demonstrate an instrument take-off to your instructor as though you were giving this maneuver to a student for the first time.

2. Climbs and Descents:

Demonstrate climbs and descents at a definite (indicated and absolute) rate. To demonstrate a climb at an <u>indicated</u> rate, enter a climb and explain that it is started from an exact altitude and at climbing air speed. The power must be increased to the approximate setting that will result in a 500 fpm indicated rate of climb. The air-speed indicator is the primary pitch instrument during the entry. When the vertical speed approaches 500 fpm (rate of climb), it becomes the primary pitch instrument, and the air-speed indicator is the primary instrument for power control. Show that any deviation of the vertical-speed indicator indicates a need for a change in the pitch attitude, and that the air-speed indicator is controlled by the use of power. Show how a normal level-off is made from a definite-rate climb.

Demonstrate a descent at an indicated rate. The technique and cross-check used for descents are exactly the same as those used for climbs. The only difference is the direction of vertical movement.

To demonstrate a descent at an absolute rate, enter a definite rate-timed descent of 500 fpm and point out that the same entry technique is used as was used in a definite rate descent. The entry is started when the second hand of the clock is on a cardinal position. The first 30 seconds are used in establishing the proper vertical speed and trimming the aircraft; thereafter, the altimeter should be cross-checked every 15 seconds to determine whether the absolute rate of descent is being maintained. The altimeter, when checked, should read approximately 20 to 40 feet behind the clock, since the aircraft does not start descending immediately at the desired rate. This lag is maintained throughout the descent. If the exact rate of descent is being maintained, change the pitch attitude so that the rate is too fast (or too slow) and then show how to correct the pitch attitude to compensate for this error. When the cross-check of the altimeter and the clock indicates that the error has been corrected, the pitch attitude is adjusted to hold the desired absolute rate of descent. This method of determining an absolute rate of descent is used to calibrate the vertical-speed indicator.

Now demonstrate a climb at a definite (absolute) rate and finally demonstrate a timed climb, pointing out that the techniques and cross-check used for definite-rate timed climbs is exactly the same as that used for definite-rate timed descents. The only difference is the direction of vertical movement.

You will be given additional practice with all available instruments and without the directional gyro or artificial horizon.

3. Vertical S and Vertical S-1:

You will demonstrate the Vertical S. Establish a normal descent at a definite (indicated) rate of 500 fpm, descend 500 feet, and then start a climb. Point out the proper coordination of pitch and power. The lead associated with a descent level-off is used as the starting point for the reversal in vertical direction. As soon as the power is changed, the air-speed indicator is the

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primary pitch instrument. Proper use of the trim tabs increases the ease of aircraft control. Stress the need for a rapid cross-check during the changes in vertical direction.

You will demonstrate the Vertical S-1. Enter the Vertical S-1 in the same manner as entering a descending turn. The direction of turn is reversed after every descent. Pitch, bank, and power are changed simultaneously as soon as the proper altitude is reached. Re-emphasize the necessity for proper trim during this maneuver.

Practice the Vertical S and Vertical S-1 with all available instruments, and then without the artificial horizon.

4. VHF/DF Procedure:

Your instructor will demonstrate a VHF/DF procedure as discussed during ground briefing.

5. Ground-Controlled Approach (GCA):

Maneuver the aircraft to a position suitable for a GCA down-wind leg. Over the interphone simulate the initial call-in and explain that the pilot must acknowledge all transmissions until otherwise instructed by the final controller. Headings and altitudes are always repeated while lengthy transmissions are acknowledged with "Wilco" or "Roger." Continue the simulated GCA instructions and perform the landing check while still on the down-wind leg. Point out the similarity of GCA procedures to a visual pattern. Continue the pattern by turning to a base leg. All changes in headings of more than 45° are made at a standard rate of 3° per second. Have your instructor observe while the final cockpit check is performed. Simulate a turn to the final approach heading and emphasize that when the range is given as seven miles, the air speed is reduced to descending speed and the landing flaps set for landing. Reduce the air speed and set the flaps while your instructor observes. The altitude and heading must remain constant during the change in air speed. The descending air speed is the same as normally used on a visual approach to land. Simulate receiving instructions to change headings and emphasize that on the final approach the degree of bank will not exceed the number of degrees to be turned. When the air speed is at or near the desired reading, and the altitude is off 50 feet or less, a change in pitch alone is sufficient to bring the aircraft back to the glide path. If the error from the glide path is more than 50 feet a change in both pitch and power is necessary. Stress the importance of making immediate corrections when instructed by the final controller.

C. After the Flight:

Your instructor will review your errors and point out your weak points; discuss the flight and error analysis and show its application to cadet training and assign the next lesson if you have completed this one satisfactorily.

Inclosure No. 1
TPO-C-105401K-IF-3

AIRWAYS AND AIR COMMUNICATIONS SERVICE*
DETACHMENT 1922-2
1922nd AACS Squadron
Craig Air Force Base, Alabama

28 April 1952

SUBJECT: Standard Operating Procedures for VHF/DF

TO: All Concerned

PURPOSE

This Direction Finding Unit is operated primarily for rendering steers to the station with zero wind, for homing, and to render bearings from the D/F station to the aircraft as applies.

1. Practice Steers

a. All practice steers will be conducted on VHF Channel "C" 137.88 megacycles. Under no circumstances will "D" Channel 121.50 megacycles be utilized for practice steers. For the benefit of all concerned several practice steers should be accomplished in order to minimize possible errors.

b. Example of aircraft and D/F operator's use of phraseology when accomplishing a practice is as follows:

(1) Pilot calls VHF/DF station.
"Craig DF Homer, this is AF 1234, Over"

(2) D/F Operator acknowledges:
"AF 1234, this is Craig DF Homer, Over"

(3) Pilot:
"Craig DF, this is AF 1234, request practice steer to Craig"

(4) D/F Operator:
"AF 1234, Craig DF Homer, Transmit a 20 second CW tone for steer to Base"

(5) Pilot depresses CW tone button for 20 seconds

(6) Pilot:
"AF 1234"

* A reproduction of the original regulation.

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(7) DF Operator:
"AF 1234, Craig DF Homer, your steer to base is 315 degrees, Class Able with zero winds; stand by, will re-check in two minutes."

(8) Pilot:
"AF 1234, Craig DF Homer, understand 315 degrees, standing by."

(9) DF Operator:
"AF 1234, Craig DF Homer, request:
(a) Aircraft type.
(b) Frequencies aircraft able to work.
(c) Type of distress (low of fuel, lost, weather, etc.)
(d) Last known position and has he changed heading since that time.
(e) Amount of fuel.
(f) Number of personnel aboard.
(g) Altitude and flight conditions.
(h) Pilot's name and home station."

c. Maximum intervals between steers during emergency is as follows:

Jet type aircraft -- steer every one (1) minute.
Conventional type aircraft -- steer every two minutes.

d. The DF operator will call the aircraft every minute or two minutes as applicable and will not wait for the pilot to make the transmission if the time element between steers has elapsed.

3. EMERGENCY PROCEDURES FOR LOST AIRCRAFT AND COORDINATION WITH OTHER FACILITIES AND SERVICES:

a. Each D/F operator must coordinate or cause to be coordinated, all emergency operations with other AACS facilities and services in order to insure that maximum service is rendered each aircraft. Flight Service, control tower, and air traffic control personnel must be given as much information as possible regarding each request for emergency assistance in order that further service and the avoidance of accidents can be made possible. This can be accomplished by the above cited facilities monitoring the frequency the distressed aircraft is working. EXAMPLE: When the aircraft gets within sight of Craig AFB, the tower should clear the traffic pattern and be standing by to alert crash facilities if required.

b. Immediately upon receipt of a distress call from an aircraft and if call is initiated on any frequency other than "Dog" Channel (121.50 mc) operator will request aircraft to change to "Dog" if available. The D/F operator will then take a bearing and relay steer to aircraft. The operator will then obtain the following information from the aircraft and relay it to the control tower.

(1) Aircraft number and type.
(2) Frequency aircraft able to work.
(3) Type of distress (low on fuel, lost, weather, etc.)
(4) Heading and last known position and whether he has changed his heading since that time.
(5) Amount of fuel.
(6) Number of personnel aboard.
(7) Altitude and flight conditions (IFR or VFR).
(8) Pilot's name and home station.

c. The tower will then notify the following facilities of the above information.

(1) Atlanta Control (if IFR).
(2) Flight Service.
(3) Det C. O. / NCOIC.
(4) Base Operations.

4. Classification of Bearings:

a. According to its estimate of the accuracy of the observation, the D/F station classifies bearings as follows:

(1) A Class A bearing is one which the direction finding operator may reasonably consider to be accurate to within pluse or minus two (2) degrees. (The arc of the minimum signal should not normally exceed twenty (20) degrees).

(2) A Class B bearing is one which the DF operator may reasonably consider to be accurate to within plus or minus five (5) degrees. (The arc of the minimum signal should not exceed forty (40) degress).

(3) A Class C bearing is one which the DF operator may reasonably consider to be accurate to within plus or minus ten (10) degrees.

(4) Bearings in excess of Class C will be so designated by the appropriate operating signal or radio telephone phrase.

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(5) In cases of emergency, if operator is unable to classify a bearing, an immediate notification will be relayed to Maxwell AFB, Alabama and Greenville AFB, Mississippi, (via landline facilities in control tower to standby for the aircraft.)

5. Operating Signals:

	QUESTION	ANSWER
a.	What is my true bearing from you? or What is my true bearing from __(call sign). or, What is the true bearing of __ (call sign) from __(call sign).	Your true bearing from me is __ degrees (at __ hours). OR your true bearing from __(Call sign) was __ degrees (at __ hours). OR the true bearing of __(call sign) from __(call sign) was __ degrees (at __hours).
b.	Will you indicate the magnetic course for me to steer toward you (or __) with no wind?	The magnetic course for you to steer to reach me (or __) with no wind was __ degrees at __ hours.

BY ORDER OF COLONEL BUNDY:

STEPHEN D. ARMSTRONG
Captain USAF
Base Operations Officer

HARVEY L. DURDEN
M/Sgt USAF
Detachment NCOIC

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TPO-C-105401K-IF-4
May 1952

INSTRUMENT LESSON IV (Primary)

I. OBJECTIVE:

A review to give you additional practice on maneuvers previously covered.

II. MANEUVERS:

See Lesson 1, 2, and 3.

III. LESSON PROCEDURE:

Assigned by your instructor according to your needs.

INSTRUMENT LESSON V (Primary)

I. OBJECTIVES:

At the end of this lesson you should be able to give an oral presentation and demonstration of the maneuvers and procedures listed below.

II. MANEUVERS*:

A. Magnetic Compass (AFM 51-37, ch. 1, p. 41; AFM 51-38, ch. 4.)

B. Timed Turns (AFM 51-37, ch. 1, pp. 42-44; AFM 51-38, ch. 10)

C. Pattern "A" (AFM 51-37, ch. 1, pp. 44-45).

III. LESSON PROCEDURE:

A. Ground Briefing:

1. Magnetic Compass:

Explain the turning errors of the magnetic compass. When an aircraft is turned in the north or south quadrants, the magnetic compass will give an erroneous indication. The magnitude of this error varies with the angle of bank being used and the proximity to a northerly or southerly heading, because the error becomes progressively smaller as east and west headings are approached. The error also depends upon the latitude in which the aircraft is flying. All methods of compensating for turn error in medium latitudes are based on using a definite and constant degree of bank (between 15° and 18°) and not a standard-rate turn. Give the correct number of degree to overshoot or undershoot on turns to magnetic compass headings. On northerly and southerly headings the wings must remain level if the magnetic compass is to indicate a correct heading.

Explain acceleration and deceleration errors. A constant air speed must be maintained on easterly and westerly headings if the magnetic compass is to indicate correctly.

Explain the demonstrations to be given during the flight. Describe all demonstrations to be made in the aircraft and the expected reaction of the magnetic compass during the demonstrations.

* Sources of information are found in parentheses.

2 Timed Turns:

You will explain timed turns by reviewing the proper method of entering and recovering from turns Cover in detail the air work to be accomplished Be sure to emphasize the degree of bank needed to produce a standard-rate turn at different air speeds

Discuss calibration of the turn needle

3 Pattern"A":

You will explain the Pattern "A " Discuss the proper air speeds to use during each phase of the maneuver, and explain when the change of air speed is accomplished Point out that timing for the pattern is connective and reference should be made to the pattern when flying Do not try to memorize pattern

B In the Aircraft

You give the instrument cockpit check to your instructor and demonstrate an instrument take-off to him In addition, the new procedures or maneuvers to be covered in this lesson are listed below

1 Magnetic Compass:

Give a demonstration of the characteristics and uses of the magnetic compass Demonstrate northerly turning error by placing the aircraft on a magnetic heading of north and flying a straight course for a few seconds until the compass has settled down Roll the aircraft into a bank and enter a turn to the west The compass will immediately indicate a turn to the right, i e , toward east Return to straight flight on a heading of north and repeat the demonstration; however, this time, enter a turn to the east and point out that the compass indicates a turn to the west. Demonstrate also that if a turn is entered slowly from a northerly heading, the compass indicates that a straight course is being maintained It is impossible to read the compass on a northerly heading unless the wings are level and the compass is given time to return to the correct heading Demonstrate a steep turn from a heading of north, showing that the compass lags excessively and may swing completely around in the opposite direction from the turn

Demonstrate southerly turning error by placing the aircraft on a heading of south and entering a turn Point out that the compass indicates a much faster turn in the same direction The angle of bank used governs how much the compass is in error

On southerly headings the wings must be levelled before the compass is read.

Demonstrate acceleration and deceleration error by placing the aircraft on a heading of east and showing the errors, first by changing the air speed in level flight, and then by raising and lowering the nose with a constant power setting. The magnitude of the error depends upon the rate of acceleration or deceleration. To read the compass accurately on easterly or westerly headings, the air speed must be constant. Repeat this demonstration using a heading of west. Point out that either on westerly or easterly headings, deceleration error is always to the south and acceleration error is always to the north. These errors are not present in constant air-speed climbs and descents.

Demonstrate the proper method of setting the directional gyro to a magnetic heading. On headings in the northern and southern quadrants, the aircraft must be in coordinated, straight flight with a constant air speed in order for the magnetic compass to be read properly. On headings of east and west, stress the importance of maintaining a constant air speed in order to assure correct readings on the magnetic compass.

Demonstrate turns to magnetic compass headings. Turn to a heading of north using 15° to 18° of bank. Show the student the number of degrees of lead to use. The speed of roll-out is the same as previously taught. Turn to a heading of south using 15° to 18° of bank. Show the student the number of degrees to overshoot. Demonstrate turns to headings of east and west. Point out that the turn error is small but still present until reaching exactly east or west. For a turn to a heading of east or west from north, the lead should be 10° to 12°; however, when turning from a southerly heading the lead will be only 5° to 6°. Interpolation is required to turn to any intermediate heading.

Now you practice turns to magnetic compass headings without the directional gyro, and then without the directional gyro and the artificial horizon. Also practice setting the directional gyro to correspond to the magnetic compass heading.

2. Timed Turns:

You will give the demonstration for timed turns. Show how to calibrate the turn needle. Establish the proper angle of bank on the artificial horizon and point out the position of the turn needle

The ball must be centered throughout the turn. This position of the turn needle should give a rate of turn of 3° per second. The exact position of the turn needle is noted and the turn continued for 30 seconds. A turn of 90° should be shown on the directional gyro and any deviation is corrected in a timed turn by increasing or decreasing the rate of turn as shown by the turn needle.

Show how to execute a timed turn using all gyro instruments. Enter a standard-rate turn and point out that it is started when the second hand is on a cardinal position. The first 30 seconds are used to establish the turn properly, and the directional gyro is then checked to see whether the rate of turn is proper. It should indicate a turn of 90° minus the number of degrees of lag for that particular angle of bank. Demonstrate how the angle of bank is increased or decreased to compensate for any error. After the first 30 seconds the directional gyro should be cross-checked every 10 or 15 seconds (see AFM 51-37). Timing is very important. The time is started when pressure is applied to roll into the turn and is stopped when pressure is exerted to roll-out. In a timed turn with all the instruments available, the aircraft is rolled out on the desired heading regardless of the timing. The method of cross-check is exactly the same as that used in turning to directional gyro headings except that the clock is now added.

Demonstrate a timed turn without the directional gyro and artificial horizon. With the directional gyro and artificial horizon caged, enter a 30-second timed turn, using the turn needle and the clock. The rate of roll-in and roll-out must be the same. The proper position of the turn needle must be maintained throughout the turn. It is primary for bank control. When 30 seconds have elapsed, start the roll-out. When the wings are level, the magnetic compass should indicate a turn of 90°. When turning more than 45°, a standard-rate turn is used; from 20° to 45°, a 2°/second turn is used; for a turn of 20° or less a 1°/second turn is used.

You will practice timed turns at different air speeds with all available instruments, then without the directional gyro, and finally without the directional gyro and the artificial horizon.

3 Pattern "A".

You will demonstrate Pattern "A." Start Pattern "A" and continue the pattern through at least two turns. This should be sufficient demonstration. You should understand that the timing for the legs begins when control pressure is applied to recover from

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the preceding turn. After recovery from turns, sufficient time is allowed for the compass card to cease oscillating before changing the air speed. When a correction in heading is required, it should be made before changing the air speed; if no correction is required, the air speed is changed immediately. You should be able to accomplish the pattern on any heading as the turns are identical with standard holding procedures; however, some practice with all available instruments and on cardinal headings should be allowed for familiarization. Now practice the Pattern "A" without the directional gyro, and then without the artificial horizon and the directional gyro.

4. Review "GCA":

You will give your instructor a simulated GCA. Maneuver the aircraft into a position on the down-wind leg for the traffic pattern being used at the home field. Let your instructor take control and fly while you act as a ground controller for the remainder of the approach. Call Runway Control when 3 miles out on final approach for possible touchdown clearance or further instructions.

C. <u>After the Flight:</u>

Review with your instructor any errors made during the flight. He will point out any points on which you need practice and discuss the flight with respect to cadet training. You will be assigned the next lesson if this one has been satisfactorily performed.

TPO-C-105401K-IF-6
May 1952

INSTRUMENT LESSON VI (Primary)

I. OBJECTIVE:

At the end of this lesson you should be able to give an oral presentation and demonstration of the maneuvers and procedures listed below.

II. MANEUVERS*:

A. Steep Turns (AFM 51-37, ch. 1, p. 46)

B. Change of Air Speed in Turns (AFM 51-37, c... 1, pp. 47-48)

C. Pattern "B" (AFM 51-37, ch. 1, pp. 48-49)

III. LESSON PROCEDURE:

A. Ground Briefing:

The three phases of instruction to be explained in the ground briefing of this lesson follow.

1. Steep Turns:

You will discuss with your instructor the procedure used for making steep turns. Stress the fact that the technique of entry, control during the turn, and recovery are the same in steep turns as in normal turns. Any turn with a degree of bank greater than 30° is considered a steep turn and these are practiced to test the ability of the pilot to react quickly and smoothly to changes in attitude of the aircraft.

2. Changing Air Speed in Turns:

Explain the procedures for changing air speed in a turn. Establish bank for a standard-rate turn and then reduce power. Change bank and power simultaneously.

3. Pattern "B":

Explain Pattern "B." It is designed for practice in combining most of the maneuvers covered thus far and for teaching the

* Sources of information are found in parentheses.

student to plan ahead of the aircraft. As the pattern contains no new material, the only ground instruction necessary is an explanation of the timing and sequence of the maneuvers that compose the pattern. The Pattern "B" is similar to the Pattern "A" except that all the flight instruments are used and the air speed changes are accomplished during the turns. Power adjustments to change the air speed are made at the same time control pressures are applied to enter the turn. Timing is consecutive and is begun when control pressure is applied to enter or recover from the turn. Be sure you have a good picture of the pattern before attempting to fly it. Memorization is beneficial but unnecessary. The use of a card is recommended as it helps prepare anyone to control the aircraft and read a chart simultaneously. The pattern may be started on any heading, however, you should start practicing the pattern on cardinal headings.

B. In the Aircraft:

Have your instructor give the instrument cockpit check, and make an instrument take-off (hooded). You will be expected to give any assistance necessary to accomplish this take-off. Remember to keep your instructions to a minimum during actual take-off. After completion of turns out of traffic take control and tell your instructor what he did wrong and how he can correct for these mistakes next time. Then proceed to the practice of the three new maneuvers that follow.

1. Steep Turns:

You will demonstrate steep turns. Stress that regardless of the degree of bank, the procedures of entry, recovery, and control during a steep turn are the same as those used in normal turns. As the bank increases, the nose of the aircraft must be raised to avoid loss of altitude resulting from the decrease of vertical lift on the wings. The altimeter is the primary pitch instrument. When the nose is raised, additional power is needed to maintain the desired air speed. Altitude is maintained with pitch control, and power is added when the air speed starts to decrease. (Although a constant air speed is desirable, it is difficult to hold, and limits on air-speed control are relaxed for grading purposes). The air-speed indicator is used as an aid to pitch control. Any rapid change would indicate change in pitch; however, it is always used with the altimeter when making a correction. The altimeter and vertical-speed indicator combination, in most cases, is the best for pitch control. A constant bank must be maintained after the desired banking attitude has been established. Any change in bank makes a pitch control difficult because of the corresponding changes in vertical lift. Point out that the roll-out must also be smooth and coordinated so that the pitch and power may be adjusted properly.

You will have an opportunity to practice steep turns with all available instruments, and then without the artificial horizon and directional gyro.

2. Change of Air Speed in Turns:

You will demonstrate and explain a change of air speed in turns. Establish a standard-rate turn at high cruising air speed, then reduce the power to a low cruise setting. Point out the change in bank that is necessary to maintain the standard-rate turn as the air speed decreases. Point out the similarity between this maneuver and the change in air speed in straight flight. Re-emphasize the fact that the altimeter is the primary pitch instrument, and the artificial horizon, if available, or the turn needle is the primary bank instrument.

With the aircraft in straight-and-level flight at low cruising speed, demonstrate the procedure for entering a turn and changing the power at the same time the bank is being established. The simultaneous change in bank and power is the only difference between this and the previous demonstration. Stress the need for keeping the aircraft trimmed during the change in speed.

You will now have opportunity to practice changes of air speed in turns. Use high, normal, and low air speeds as required by Pattern "B." Perform the changes first with all available instruments and then without the artificial horizon. Now practice timed turns, with all instruments, changing air speed during the entry.

3. Pattern "B":

In the demonstration of Pattern "B", you will demonstrate to your instructor as much of the pattern as he thinks is necessary to insure that you understand the technique and procedure involved. You will practice at least one pattern using all available instruments.

4. Review Practice:

You will demonstrate and explain the correct VHF/DF procedure. You will give your instructor a simulated GCA before returning to the field, using the same procedure outlined in Lesson IV.

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C. After the Flight:

Your instructor will discuss this flight with you, emphasizing error analysis and how to apply it to cadet training. He will assign you the next lesson if you have completed this one in a satisfactory manner.

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INSTRUMENT LESSON VII (Primary)

I OBJECTIVE

At the end of this lesson you should be able to give an oral presentation and demonstration of the maneuvers listed below

II MANEUVERS*

A Climbs and Descents to Predetermined Altitudes and Headings (AFM 51-37, ch 1, p 49)

B Recovery from Unusual Attitudes (AFM 51-37, ch 1, pp 49-51).

III LESSON PROCEDURE

A Ground Briefing

In this ground briefing the two distinct phases listed below must be covered

1 Climbs and Descents to Predetermined Altitudes and Headings

Explain the procedures and techniques used in climbs and descents to a predetermined heading and altitude Proper execution of climbs and descents to predetermined headings and altitudes requires thought, skill, and a rapid and accurate cross-checking of all instruments These maneuvers incorporate nothing which has not already been learned The only requirements are the ability to make a timed turn and at the same time accomplish a climb or a descent at an absolute rate Accuracy is expected, and it will be necessary to cross-check the altimeter with the clock while also checking the directional gyro to see if the desired amount of turn and change in altitude have been completed

2 Recovery from Unusual Attitudes

Explain what unusual positions are, how they occur, how they are recognized and the correct method of recovery

B In the Aircraft

Have your instructor give the instrument cockpit check Your

* Sources of information are found in parentheses

instructor will make an instrument take-off and you will analyze his errors. Now proceed to the two new phases to be covered in the aircraft.

1. Climbs and Descents to Predetermined Altitudes and Headings

   Demonstrate and explain climbs and descents to predetermined headings and altitudes by climbing 1000 feet and turning 360°. Before starting the maneuver reduce the air speed to climbing speed. Emphasize that as soon as the clock indicates the starting time, the pitch, bank, and power are adjusted simultaneously to enter the maneuver. Stress the necessity for proper timing and corrections in rate of climb and turn, so that the proper heading and altitude is reached when the time has elapsed. Point out that regardless of the time factor, the aircraft is levelled off on the correct altitude and heading.

   Now perform the demonstration by descending 1000 feet and turning 360°. Emphasize the points covered in the climbing turn.

   You will practice climbs and descents to heading and altitude with all available instruments (visual practice may be necessary), then without the artificial horizon, and finally, without the artificial horizon and directional gyro.

2. Recovery from Unusual Attitudes

   Explain and demonstrate the recovery from unusual attitudes. Show how the rules of recovery are applied in each case. Look at the air-speed indicator and its trend immediately upon detecting an unusual attitude. If the air speed is too high, first reduce the power, correct the bank, and then correct the pitch attitude. If the air speed is too low, increase power, correct the pitch, and then correct the bank attitude. Demonstrate the recovery from a diving spiral, the top of wing over (air speed low, but increasing), the top of wing over (air speed low and decreasing), and the recovery from stalls. Point out that a stall recovery is made exactly as in contact flight. After a short practice, all components of control should be changed simultaneously. Speed in recovery is essential and excessive loss of altitude is undesirable. When the altimeter and air-speed indicator stop and start to reverse their direction of movement, the aircraft is in an attitude that would give level flight. The altimeter immediately becomes the primary pitch instrument and a constant altitude is held. Emphasize that in recovery from all unusual attitudes a climb or descent back to the original altitude will begin as soon as a safe air speed has been attained. Do not wait until cruising air speed has been attained.

Have your instructor recover from the unusual attitudes listed below. Tell him what he is doing wrong on recovery and how it can be corrected. In recovering from unusual attitudes, he should return to original headings and altitudes, using instruments that normally remain in operation during such maneuvers as the following:

a. Diving spiral.

b. Top of wing-over where air speed will build up.

c. Start of wing-over with nose-high attitude.

d. Stalls.

e. Any other reasonable positions that are necessary.

C. <u>After the Flight:</u>

Your instructor will review this flight with you pointing out your weak points and how to correct them. He will assign you the next lesson after you have satisfactorily completed this one.

INSTRUMENT LESSON VIII (Primary)

I. OBJECTIVE:

A review to give you additional practice on maneuvers previously covered.

II. MANEUVERS:

Lessons 1, 2, 3, 5, 6, and 7

III. LESSON PROCEDURE:

Assigned by your instructor according to your needs.

INSTRUMENT LESSON IX (Primary)

I. OBJECTIVES

This lesson is an evaluation flight to:

A. Provide another evaluation (other than by your assigned instructor) of your capabilities and potentialities as a flight instructor.

B. Provide you with some insight into the typical errors, mental apprehensions, and the proficiency level of student pilots undergoing check flights.

C. Teach you how to recognize a student pilot's potentialities and how to determine when he should be given additional training.

II. MANEUVERS

You will be expected to conduct the ground briefing, in-flight demonstrations, and oral presentation of this lesson.

III. LESSON PROCEDURE

A. Ground Briefing:

You will be notified prior to the date of your evaluation flight and assigned a particular lesson to study. Prior to executing the flight, the PIS instructor will brief you on the type of evaluation flight that is to be accomplished while he is flying the aircraft as a student pilot (progress or final proficiency check).

B. In the Aircraft:

For the first half of the flight, you will assume that the PIS instructor is a student pilot who supposedly has reached the level of proficiency that warrants the presentation of this particular lesson. On this part of the flight, the instructor is interested in your instructional abilities on aerial demonstrations, oral presentation, error analysis, and standardization.

During the latter part of the flight, you will assume that the PIS instructor is a student pilot who, for a specific reason, is receiving an evaluation flight on this particular lesson. On this part of the flight, the instructor is interested in your evaluation of the student's potentialities and your recommendations concerning further training.

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C After the Flight

Your instructor will discuss the flight with a view toward error analysis of your performance He will point out your shortcomings, your good points, and will inform you if you satisfactorily completed this evaluation ride

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GROUND SAFETY

DIGEST

NOTE: For June 1954 issue, see FTAF History, Jan-June 54, Vol II, pp 347 ff.

MAY 1954

HONOR ROLL

FIRST PRIZE PRESENTED TO:

LAREDO AIR FORCE BASE

LOWEST COST PER CAPITA ----- .43

SECOND PRIZE PRESENTED TO:

REESE AIR FORCE BASE

2ND LOWEST COST PER CAPITA .50

HONORABLE MENTION:

MATHER AIR FORCE BASE

COST PER CAPITA --- .60

BASES NOTED ON THIS PAGE
ARE NOT PERFECT YET.
BUT WITH THE ACCIDENTS OF THIS AGE
THEY HAVE NO REASON TO FRET!

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IRIS WORKSHEET

006 OLD REEL NUMBER

016 CALL NUMBER (18AN): K221.757

005 IRIS NUMBER (10AN): 00917312

026 OLD ACCESSION NUMBER (12AN)

014 MICROFILM REEL/FRAME NUMBER: 0000025995 001522

SECURITY WARNING/ADMIN MARKINGS

RD FR CN SA WI NF PV FO FS

ORAL HISTORY CAVEAT 01 02 03 04

NO CONTRACT PROPRIETARY INFO THIS DOCUMENT CONTAINS NATO ______ INFO

501 DOCUMENT SECURITY

501 U

DOWNGRADING INSTRUCTIONS

DECLASSIFY ON | REVIEW ON

CLASSIFICATION AND DOWNGRADING INSTRUCTIONS FOR

502 ____/____/____
TITLE ABSTRACT LISTINGS

028 REF ______ DEST DUP OF ______
INSERT TO ______ DUP OF ______

027 NUMBER IN AUDIO REEL SERIES1

CATALOGING RECORD

MAIN ENTRY (Use one) (150AN)

100 - PERSONAL NAME 109 - ISSUING AGENCY 120 - TITLE AS MAIN ENTRY

Flying Training Air Force

TITLE (Use one) (DO NOT USE IF TITLE IS MAIN ENTRY) (180AN)

(270) Ground Safety Digest

OR CHECK:

- ☐ 2210 ORAL HISTORY
- ☐ 222E END OF TOUR REPORT
- ☐ 223H HISTORY (AND SUPPORTING DOCUMENTS)
- ☐ 224C CHECO MICROFILM
- ☐ 226Q CORRESPONDENCE
- ☐ 228Z PAPERS
- ☐ 227P CALENDAR

250 TITLE EXTENSION ENTER VOLUME NUMBER, PARTS, ETC. (30AN)

DATES: ONLY 264 OR 265 MUST BE COMPLETED. SUPPLY BOTH IF KNOWN

264 INCLUSIVE DATE ___/___/___ TO ___/___/___ (DD MM YY)

IF DATE ESTIMATED, CHECK HERE ☐

265 DATE OF PUBLICATION 54 05 00 (DD MM YY)

300 TOTAL PAGES ______

AFSHRC FORM 7 MAY 82 PREVIOUS EDITIONS ARE OBSOLETE

MARCH-APRIL-MAY
GROUND ACCIDENT COST SUMMARY, FTAF

BASE	MARCH FATAL	MARCH TOTAL COST	MARCH COST/ CAPITA	APRIL FATAL	APRIL TOTAL COST	APRIL COST/ CAPITA	MAY FATAL	MAY TOTAL COST	MAY COST/ CAPITA	TOTAL FATAL	AVG COST/ CAPITA
LAREDO	0	2,819.00	.97	0	525.00	.18	0	383.00	.13	0	.43
REESE	0	1,217.00	.39	0	2,375.00	.79	0	931.00	.31	0	.50
MATHER	0	5,632.00	.82	0	4,904.00	.71	0	1,984.00	.28	0	.60
VANCE	0	1,625.00	.50	0	2,921.00	.89	0	1,962.00	.60	0	.66
GOODFELLOW	0	635.00	.25	0	2,191.00	.82	0	2,720.00	.99	0	.69
GREENVILLE	0	3,389.00	1.05	0	877.00	.30	0	2,140.00	.74	0	.70
FOSTER	0	606.00	.24	0	6,121.00	2.57	0	1,908.00	.87	0	1.23
ELLINGTON	0	3,218.00	.50	0	5,490.00	.84	1	36,449.00	5.59	1	2.31
J. CONNALLY	1	32,940.00	6.95	0	2,687.00	.54	0	4,104.00	.81	1	2.77
CRAIG	0	1,436.00	.50	0	1,262.00	.44	1	34,644.00	12.04	1	4.33
HARLINGEN	0	813.00	.16	0	4,287.00	.82	2	64,419.00	12.21	2	4.40
WILLIAMS	0	3,653.00	1.10	2	65,538.00	19.31	0	2,753.00	.89	2	7.10
WEBB	0	1,254.00	.44	1	34,543.00	11.97	1	32,436.00	11.29	2	7.90
GARY	0	2,167.00	.61	0	3,032.00	.86	3	95,718.00	27.64	3	9.70
BRYAN	1	33,625.00	11.52	0	2,010.00	.72	2	64,684.00	23.18	3	11.61
HQ SQN UNITS	0	1,172.00	.89	0	277.00	.21	0	0	0	0	.37
CONTRACT SCHOOLS											
Columbus	0	70.00	.12	0	21.00	.04	0	14.00	.02	0	.06
Malden	0	7.00	.01	0	28.00	.06	0	49.00	.10	0	.06
Graham	0	164.00	.33	0	28.00	.06	0	0	0	0	.13
Bartow	0	250.00	.57	0	35.00	.07	0	0	0	0	.21
Bainbridge	0	660.00	1.51	0	0	0	0	277.00	.57	0	.69
Marana	0	14.00	.03	0	1,050.00	2.46	0	95.00	.21	0	.90
Hondo	0	28.00	.06	0	1,323.00	2.70	0	457.00	.88	0	1.21
Spence	0	84.00	.18	0	98.00	.20	0	2,433.00	5.21	0	1.86
Stallings	0	2,668.00	7.85	0	1,392.00	3.15	0	21.00	.05	0	3.68
TOTALS							10	350,581.00	5.74		

ACCIDENT PREVENTION PROGRAMS AT FTAF BASES

REESE AFB

Aqua System. The Ground Safety Inspector informed the Council that bronze could not be obtained for making a valve key. He stated that a key is being made from aluminum. The key is to be six feet long and will be used by the personnel in the Aqua System to turn valve key which will eliminate the necessity for going down into the pit to operate the valves.

HARLINGEN AFB

The major topic of discussion during this meeting was the fatal accident of 2 May 1954, including causation factors and possible corrective measures. Wing Personnel Officer and Ground Safety Officer presented to the Board photographs taken at the scene of the accident, also a diagram road sketch. Wing Personnel Officer and Ground Safety Officer also presented an analysis of how the accident probably occurred.

The Chairman then asked for suggestions or recommendations designed to place more emphasis on the Ground Safety Program:

1. Wing Personnel Officer recommended that renewed emphasis be placed on a thorough safety orientation for every individual who is newly assigned to the base.

2. Commander of Air Base Group recommended that a traffic specialist be secured from the Texas State Highway Department to present lectures on safe driving practices. The Provost Marshal will coordinate this item.

3. Commander of Air Base Group stated that the Wing Commander desires that maximum consideration be given to administering corrective and/or disciplinary action to offenders of civil and military traffic laws in all cases.

4. Wing Personnel Officer recommended that each Squadron Commander provide an opportunity for each individual in his organization to attend, at some time during the month, a period in which safety is the primary subject of discussion. The Ground Safety Office will furnish material for these periods.

5. Wing Personnel Officer recommended that the Provost Marshal furnish each Squadron Commander a weekly list of all members of his organization who have newly registered automobiles on the base, and that the squadron commander personally counsel those personnel as to safe driving practices and existing traffic laws.

GREENVILLE AFB

In the absence of the Air Police Officer, the Chairman submitted an analysis of traffic violations that were reported on personnel of this base. Noted of interest was the increase in the traffic enforcement index over the previous month's report from 4.75 to 9.6. In relation to these indexes, ground accidents caused by private vehicle operation have decreased from 4 to 2 during the same period. This analysis will be submitted monthly by Air Police Officer.

It is recommended that GAFB Regulation 125-2 be amended outlining the procedures that are being used to forward the citations through the Squadron and Group Commanders to the Wing Commander. Further, that this amendment direct that "Prompt remedial action" be taken on these citations.

R&R dated 30 April 1954 from Wing Commander to Group Commanders relative to ground accidents is quoted as follows:

"1. I am very much concerned by our large increase in ground accidents over the past 3 months. I feel that some of this increase can be contributed to the fact that our commanders and supervisors have adopted the attitude of 'getting the job done, come hell or high water' and have neglected being safety conscious. Of course, our aim is to 'get the job done' but I will not condone unsafe practices or acts for I know we can do a better job in less time if we observe safety rules and practice safe operations.

2. I desire that you, together with your Squadron Commanders, make a detailed safety inspection of your area and activities for the specific purpose of correcting on the spot any unsafe condition and/or practice you observe. If the corrective action desired is not within your purview, such will be brought to my attention."

Action recommended that Group Commanders will comply with paragraph 2, in writing, as soon as possible.

LAREDO AFB

The Provost Marshal reported that the Corpus Christi and Harlingen District Offices of the Texas Highway Department will comply with our request to be notified of all Laredo AFB personnel arrested for traffic violations. Reports will be sent to this Base on the first and fifteenth of each month. Upon receipt of these arrest notices by the Provost Marshal, the Squadron Commander of the violators will be advised. The Commander can then take action in accordance with the provisions of the two letters from General Discsway, dated 24 January 1953 and 19 January 1954, regarding disciplinary action for Off Base traffic violations. The San Antonio District Office has not yet been heard from. Another letter will be sent to them from this Base requesting an answer and a further report will be made at the next Council meeting.

BRYAN AFB

Commander AB Group read the Headquarters BAFB Letter, Subj: Private Motor Vehicle Accidents, with further comment on specific information contained therein, particularly reading that portion of paragraph 3 which states that "Squadron Commanders will apply proper and firm action to control traffic law violators when it has been determined that Air Force personnel have endangered their own safety and/or the safety of others." Wing Inspector stated that recent review of Article 15 Base Disciplinary Record indicates that Commanders are taking appropriate action as required and, that actions taken are entirely satisfactory to the Wing Inspector's Office.

Commander AB Group read a TWX from Commander FTAF to Commander BAFB concerning the explosion to two oxygen purifier assemblies while in use at bases within the command with further statement that "it is imperative that all oxygen equipment maintenance, inspection and servicing procedures be reviewed to insure that all personnel are aware of proper safety precautions." Ground Safety Officer stated that the Ground Safety Office would publicize this information in the June issue of the BAFB Ground Safety Digest and that written information will be given to all Ground Safety personnel at the next monthly meeting.

Ground Safety Officer presented past accident experience records as follows:

1. The 3530th Food Service Squadron has operated from 29 April 1953 to 21 April 1954, a total of 256 days, without a fatality or disabling injury.

2. The Base Motor Pool has operated all assigned vehicles from 22 April 1953 through 30 April 1954, a total of 378 days, without a reportable USAF vehicle accident. Motor Pool operated approximately 630,000 miles during this period.

TEN FATALITIES - MAY 1954

The Command reported nine fatalities for the first four months of 1954 and then May - 10 fatals in one month. This is discouraging - if you let it be. It proves one thing. There can be no relaxation of Safety efforts. Fatalities resulted as follows:

Bryan	1 private auto
	1 drowning
Craig	1 private auto
Ellington	1 private auto
Gary	2 private auto
	1 gas explosion
Harlingen	2 private auto
Webb	1 drowning

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PREVENTATIVE ACTION

The military personnel responsible for carrying out operational functions are gradually taking a more active participation in Ground Accident prevention. This activity must be directed into the channels most likely to get the best results. Herein enters the Ground Safety Directors' responsibility and opportunity. Research, analysis of the problem and application of safety principals should insure their appropriateness.

Do not with-hold recommendations regardless of what use — or non-use — you think will be made of them. It's your responsibility to make them. It's somebody else's responsibility to execute them.

SAFETY FILMS

Three very good films are brought to your attention. The first one was made by the Caterpillar Tractor Company, Peoria, Illinois, entitled "The Gambler". Excellent for heavy equipment operator and general use.

The second one is "Permit to Drive". In this picture the "permit" does the talking. Very Effective. Write Safety Officer, Chicopee Police Depart., Chicopee, Mass., who will tell you where it is obtainable.

Kaiser Frazier dealers can supply "Word of Honor" another good film.

OXYGEN PURIFIER FILTERS

Explosions have occurred to oxygen purifiers and a possible reason has been found. It may be because purifier cartridges are labeled with decals instead of being lithographed.

Contents of TWX, 24 May 1954, from Topeka AFB reads: "Information available indicates some cartridge oxygen purifiers stock #8500-283000 have been found that are labeled with decalcomanias instead of employing lithographing as required. This is considered to be a fire and explosion hazard and should definitely not be utilized with oxygen. It is, therefore, requested that no cartridges of this type be issued for oxygen use under any circumstances. It is recommended that whenever possible cartridge marked "General Air Conditioning Corporation" be issued instead of those marked "Russell R. Gannon Company".

OFF DUTY ACCIDENTS - MAY 1954

1. Ground Accident results for May bring "The Problem" into dramatic focus. Ten fatalities, 96% of total cost, 61% of all accidents and 67% of days lost. (see page 6 for complete analysis.)
2. Who can favorably affect this result? Group and Squadron Commanders with the help of their NCOs and flight chiefs. Direct supervisors over the classes of personnel who are committing the unsafe acts, as shown by Ground Safety records.
3. How can it be done? By education and enforcement. Ground Safety Directors can assist in planning an educational program. They are familiar with command policy on enforcement.

OFF DUTY ACCIDENTS FACTS AND CAUSES

The following is the FACTS and CAUSES of Off-Duty accidents for the month of May 1954:

PRIVATE VEHICLE OPERATION

Total Accidents	28
Lost Time Injuries	33
Fatalities	7
Total Cost	$226,154.00

CAUSES

FATIGUE	DRINK	SPEED
18%	32%	50%

TRAFFIC VIOLATIONS noted in 75% of these accidents.

SUMMARY OF OFF DUTY ACCIDENTS

Percent of Accidents	61%
Percent of Days Lost	67%
Percent of Overall Cost	96%

ALTERCATIONS, DANCE HALLS AND TAVERNS

	Maj Inj	Days Lost	COST
Dance Halls and Taverns	8	78	2,340.00
TOTAL	8	78	2,340.00

UNSUPERVISED SPORTS AND RECREATION

	MAJ INJ	DAYS LOST	COST
Swimming	7*	49	64,470.00
Boating	2	11	330.00
Fishing	1	5	150.00
Softball	10	93	2,790.00
Roller Skating	1	2	60.00
Horseback Riding	2	28	840.00
Handling Firearms	2	50	1,500.00
Basketball	1	35	1,050.00
TOTAL	26	273	71,190.00

*Denotes 2 Fatalities

DOMESTIC QUARTERS AND BARRACKS

	MAJ INJ	DAYS LOST	COST
Improper Use Hand Tools	2	25	750.00
Improper Use Machines	1	7	210.00
Falls	4	41	1,230.00
Walking and Running	2	10	300.00
Fights	2	8	240.00
Burns	2*	28	32,340.00
Horseplay	2	14	420.00
Baths and Showers	1	5	150.00
TOTAL	16	138	35,640.00

*Denotes 1 Fatality

COMMAND GROUND ACCIDENT STATISTICS
MAY 1954

GOVERNMENT MOTOR VEHICLE ACCIDENTS

Base	Number	Cost	Rate
Foster	0	0	0
Gary	0	0	0
Harlingen	0	0	0
Reese	0	0	0
Vance	0	0	0
Webb	0	0	0
Hq Units	0	0	0
Ellington	1	94.00	.80
Mather	1	219.00	.82
FTAF	18	1,172.00	1.28
COMMAND LINE			
Greenville	1	61.00	1.59
Bryan	1	0	1.80
Williams	3	53.00	1.99
Laredo	1	42.00	2.32
Craig	3	317.00	2.52
Goodfellow	2	74.00	2.92
J. Connally	5	312.00	4.27

CIVILIAN LOST-TIME INJURIES

Base	Number	Days Lost	Rate
FTAF	5	37	3.36
COMMAND LINE			
Williams	1	20	7.58
Bryan	1	5	12.64
Greenville	1	8	13.68
Reese	2	4	21.25

NO OTHER BASES

REPORTED CIVILIAN INJURIES

DURING MONTH OF MAY 1954

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COMMAND GROUND ACCIDENT STATISTICS
MAY 1954

MILITARY LOST TIME INJURIES

Base	Number	Fatal	Days Lost	Rates On-Dy	Rates Off-Dy	Rates Total
Laredo	1	0	5	4.07	0	1.36
Greenville	3	0	35	0	5.94	3.96
Mather	9	0	53	1.56	6.22	4.67
Vance	4	0	47	7.05	3.52	4.70
Harlingen	7	2	38	0	7.19	4.79
J. Connally	7	0	112	2.22	6.66	5.18
Webb	4	1	22	4.04	6.06	5.38
Reese	5	0	21	0	9.92	6.61
Foster	4	0	58	11.21	5.60	7.47
FTAF	123	10	965	5.19	8.81	7.60
COMMAND LINE						
Williams	7	0	76	4.17	12.52	9.74
Gary	10	3	32	6.60	13.20	11.00
Ellington	21	1	139	10.03	12.54	11.70
Craig	9	1	87	8.39	14.68	12.58
Goodfellow	11	0	84	17.66	15.45	16.19
Bryan	13	2	51	12.52	20.87	18.08
Hq Sq Unit	0	0	0	0	0	0
Columbus						
Malden						
Graham						
Bartow						
Stallings						
Marana	1	0	2	0	10.87	7.25
Hondo	2	0	15	18.57	9.29	12.38
Bainbridge	2	0	9	0	20.05	13.36
Spence	3	0	79	20.74	20.74	20.74

COST

Base	Total	Cost/ Capita
Laredo	383.00	.13
Mather	1,984.00	.28
Reese	931.00	.31
Vance	1,962.00	.60
Greenville	2,140.00	.74
J. Connally	4,104.00	.81
Foster	1,908.00	.87
Williams	2,753.00	.89
Goodfellow	2,720.00	.99
Ellington	36,449.00	5.59
FTAF	350,581.00	5.74
COMMAND LINE		
Webb	32,436.00	11.29
Craig	34,644.00	12.04
Harlingen	64,419.00	12.21
Bryan	64,684.00	23.18
Gary	95,718.00	27.64
Hq Sq Unit	0	0
Graham		
Bartow		
Columbus	14.00	.02
Stallings	21.00	.05
Malden	49.00	.10
Marana	95.00	.21
Bainbridge	277.00	.57
Hondo	457.00	.88
Spence	2,433.00	5.21

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DOCUMENT TO ROLL INDEX

FRAME NUMBER	CLASSIFICATION NUMBER	DATE PERIOD	VOL	PT	TITLE	SECURITY CLASSIFICATION	REMARKS	DOWNGRADE/DECLASSIFICATION
6	00917301	10/69-02/70			WRAMA Data On UH-1H and UH-1P Heli-			
					copter	Uncl		None
48	00917302	07/52-12/52			"IRIS WORKSHEET ONLY"	Uncl		None
54	00917303	07/68-06/69	1		History; Arnold Engineering Development			
					Center	S/RD/FRD/Noforn		None
393	00917304	07/68-06/69			Annual History Of Pacific GEEIA Region	Uncl		None
760	00917305	01/63-06/63			Command Actions To Support; Air Force			
					Role In Space	S/Noforn/FOUO		Review On; 31 Dec 93
794	00917306	01/63-06/63			"IRIS WORKSHEET ONLY"	Uncl		None
800	00917307	01/63-06/63	22		History; Air Training Command	Secret		Review On; 30 Jun 93
1389	00917308	01/51			"IRIS WORKSHEET ONLY"	Uncl		None
1395	00917309	1939-1965			"IRIS WORKSHEET ONLY"	Uncl		None
1401	00917310	05/52			Pilot Instructor Training-Flightline,			
					TPO-C-51-3-CF	Uncl		None
1463	00917311	05/52			Pilot Instructor Training: 51-105401K			
					Primary Instrument Lesson Guide	Uncl		None
1522	00917312	05/54			Ground Safety Digest	Uncl		None
1537					INDEX			

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