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# SURVEY REPORT

## HF TELECOMMUNICATIONS SYSTEM

Peshawar and Quetta, Pakistan

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**SITE SURVEY REPORT**  
**HF TELECOMMUNICATIONS SYSTEM**  
**PESHAWAR & QUETTA, PAKISTAN**

**1 INTRODUCTION**

**1.1 GENERAL**

This survey document is provided to document the results of a site survey of the RONCO and AID sites located in Peshawar and Quetta, Pakistan. The primary purpose of the survey was to collect data to develop an **ASTRO** installation plan for performance of Contract No. B200927, and identify any potential problems related to the execution of the installation plan.

**1.2 OVERVIEW**

The highlights or major results of the survey are identified below.

- General system overview with all end-user Chiefs of Party (COP) in Peshawar and Quetta, Pakistan.
- Survey performed at each end-users BSAA location to determine the location of equipment (BSAA, telephones, and DC power supply) in Peshawar and Quetta.
- Determination of each site location in Peshawar and Quetta.
- Survey of proposed HF Base Station locations in Peshawar and Quetta.
- Identification of end-user existing and future fixed and vehicular equipment requirements.
- Interview of Afghan technicians for maintenance technicians selection in Peshawar.

The following are the major topics of interest which require clarification. Issues are not in any priority.

- Issue 1. Guyed vs Self-Supporting Towers in Peshawar and Quetta.
- Issue 2. Tower heights at Peshawar and Quetta.

- Issue 3. Requirement to provide fixed and/or transportable HF radios vs. mobile radios.
- Issue 4. Requirement to provide the end-users with a system operation plan.
- Issue 5. Provide Afghan maintenance personnel in Quetta.
- Issue 6. Training end-user personnel in use and installation of fixed and transportable radios.
- Issue 7. No suitable locations are available at each BSAA for proper ventilation for battery fumes.
- Issue 8. No transmitter building is available at the Pabbi Facility.
- Issue 9. Based on location of the HF Base Station antenna, Maintenance facility to be adjacent to transmitter building.
- Issue 10. Storage facility for BSAA equipment required in Peshawar City to reduce travel time to University Town locations.
- Issue 11. Specified antenna does not fit in only suitable location in Quetta
- Issue 12. Modifications to be made to a portion of the Nasir Pur Maintenance Facility for warehouse and vehicle maintenance.
- Issue 13. Location of radio equipment in end-user vehicles.
- Issue 14. Responsible Agency for system operation.

## **2 APPLICABLE DOCUMENTS**

### **2.1 RONCO CONSULTING CORPORATION**

Contract No. B200927

## 2.2 MAPS

### 2.2.1 Defense Mapping Agency Aerospace Center (DMAAC)

#### **Peshawar**

Jet Navigation Charts (JNC) Scale 1:2,000,000

Operational Navigation Charts (ONC) Scale 1:1,000,000

Tactical Pilotage Charts (TPC) Scale 1:500,000

Combined Joint Operations Graphic, Scale 1:250,000, Series 1501 C, Sheet NI 42-8, Edition 1.

Peshawar Guide Map, First Edition 1:15,000

Pakistan, 1:500,000 Sheet NI-42/NE First Edition Layered.

#### **Quetta**

Joint Operations Graphic (Air), Scale 1:250,000, Quetta, Pakistan, Afghanistan and Pakistan

## 3 SURVEY RESULTS

### 3.1 GENERAL

This document has been prepared to provide the necessary physical and technical details required to successfully install and test the HF Telecommunications System at Peshawar and Quetta, Pakistan. This survey was completed during the period of 11 August through 25 August 1992, by Mr. Thomas A. Dunlap, Project Manager, **ASTRO** Systems, Inc.

## 3.2 PESHAWAR, PAKISTAN

### 3.2.1 Introduction

Peshawar is located approximately 155 kilometers west of Islamabad. A super highway named the Grand Trunk Road connects the two cities.

Initially, the telecommunications equipment located in the Peshawar area was identified as the following major components.

- HF Base Station
- Base Station Access Arrangements (BSAA)
- Mobile HF Radios

Since a number of the end-users already have permanent or semi-permanent operations within Afghanistan, the need for a fixed HF station vs a mobile configuration was revealed. In addition, some end-users requested a transportable unit which could be used at temporary work sites within Afghanistan. This results in the following re-definition of major system components.

- HF Base Station
- Base Station Access Arrangements (BSAA)
- Mobile HF Radios
- Fixed HF Radios
- Transportable HF Radios

Table 3, *System Equipment Distribution*, provides a site-by-site listing of each end-user's requirements.

### 3.2.2 Administrative Matters

#### 3.2.2.1 Points of Contact

The primary point of contact for future activities in Pakistan is Mr. Guy Bowen, RONCO Islamabad, Chief of Party. In addition, the following personnel were

identified as the primary POCs at the end-user locations in Peshawar.

AID/REP/P

57-C Gulmohar Lane.

University Town, Peshawar

Phone: 41354, 45257

Fax: 41378

Point of Contact: Mr. Hank Cushing

RONCO/P

Procurement Component

Railway Rd. Peshawar

Phone: 211299/215989

Fax: 211299

Point of Contact: Mr. John McHale, Area Commodity Mgr.

RONCO/MDC

Mine Detection Center

Animal Holding Facility

Grand Trunk Rd, Pabbi

Phone: 778236

Point of Contact: Mr. John Ottenberg

DAI/P

31 Chinar Rd.

University Town, Peshawar

Phone: 45307/45407

Fax: 840301

Point of Contact: Mr. Richard Smith (Islamabad)

CCSC/P

19-A Jamrud Lane

University Town, Peshawar

Phone: 41178/44578/44651

Fax: 840274

Point of Contact: Mr. Larry Sinclair, Chief of Party  
Mr. Ron Lovell

VITA/P

3-B1 Circular Lane

University Town, Peshawar

Phone: 42254/44518/42979

Fax: 840247

Point of Contact: Mr. Mir M. Sediq, Chief of Party

UNO/P

35 F/A Khushal Khan Kattak Rd.

University Town, Peshawar

Phone: 44536/45318/42103

Fax: 840492

Point of Contact: Mr. Gerald Boardman, Chief of Party

MSH/P

Old Bara Rd.

University Town, Peshawar

Phone: 42647, 44564

Fax: 840297

Point of Contact: Mr. William Oldham, Chief of Party

IRC/P

41-F Sahib Zadar Abdul Quyam (SAQ) Rd.

University Town, Peshawar

Phone: 41274/41845/43242

Fax: 840283

Point of Contact: Mr. Randolph Martin, Chief of Party

RAP POC: Mr. Andrew Wilder

RPA POC: Mr. Allen C. Jelich

IMC/P  
GPO 562/55C-3  
Gulmohar Lane  
University Town, Peshawar  
Phone: 40429, 43512  
Fax: 42250  
Point of Contact: Mr. Michael Chommie, Admin Officer

CARE/P  
Ali Road  
Academy Town, Peshawar  
Phone: 43875, 44748  
Fax: 45317  
Point of Contact: Mr. Dale Harrison

Note: The in-country phone and fax prefix code for Peshawar is 0521.

#### 3.2.2.2 Initial Contact Meeting

On 12 August 1992, a meeting of all Chiefs of Party (COP) was held at the new O/AID/Rep facility. A brief outline of the system operation was presented in a printed format to all attendees. Some interesting points were raised by a number of the attendees.

- **Off-Road Vehicles.** Pickup trucks are used by a number of the end-users. Based on the size of the radio, tuner and Nocode device some re-engineering of the mounting technique will be required. The models of the pickup trucks currently being used are:
  - Toyota Hilux Pickup
  - Toyota Hilux Crew Cab Pickup
- **Fixed HF Station vs Mobile.** Some end-users do not desire using mobile radios. DAI and MSH indicated that they desire to convert the units to fixed stations within Afghanistan. Clearly these organizations have made relocations into Afghanistan since the original surveys. Questions were raised regarding the feasibility of converting the mobiles into base stations. I advised that this

modification could be accomplished by using a battery bank, battery charger, and a different type of HF antenna. All parties were advised that this would be a change to the current scope of work. Guy Bowen (RONCO/P) stated he will advise RONCO Washington regarding this issue.

- **Power Fluctuations.** Questions were raised regarding system performance since AC power in Peshawar fluctuates and in some cases fails for long periods of time. The group was advised that the BSAA configurations are operated from a battery source with an average backup time of 8 hours. In the event of longer AC outages it was suggested that each group use a small portable generator.
- **Spare Parts.** The issue of spare parts was discussed. I advised it was my understanding that only complete units spares have been ordered. No board level or component repair parts are being provided. Personnel were advised that warranty repair required the removal and replacement of the failed unit by local personnel. All failed units must be returned to ASTRO for repair during the warranty period.
- **Radio Mount.** A large majority of the vehicles are utilized in an off-the-road environment. Questions were raised regarding the sturdiness of the radio mount. I advised that a standard commercial mount is being supplied, not a military or tactical shock mount device.
- **Inspection Schedule.** A specific site visit schedule was determined at the close of the meeting. Site inspections for the site were accomplished in the following sequence:

Thursday 13 August

DAI

RONCO/P

Friday 14 August

VITA

IMC

Saturday 15 August

MDC (Mine Detection Center)  
IRC

Sunday 16 August

UNO/ESSP  
HRD (new organization)

Monday 17 August

O/AID/Rep  
CCSC/ACLU

Tuesday 18 August

MSH  
CARE

Pursuant to a request from RONCO, **ASTRO** had developed an overview of the communications system. This was presented to the personnel that attended the meeting. A copy of the document is provided as addenda to this report.

3.2.3 Civil Engineering Matters

3.2.3.1 Introduction

3.2.3.2 Antenna Foundations

3.2.3.2.1 HF Base Station Antenna

The Antenna Products, Model LPH-0408 will be utilized as the base station HF antenna. Installation of the antenna requires a specific amount of area for proper operation. Decisions for final location of the two (2) HF base station antennas at Peshawar and Quetta were based on the physical dimensions of the required antenna.

### 3.2.3.2.2 UHF Antenna Support Towers

The original bill of materials required providing 50 foot and 100 foot guyed antenna towers manufactured by Rohn. It is our understanding that these products were selected primarily for their transportability (i.e. temporary installation in Pakistan with the easy ability to de-install the towers and re-install the towers when the HF system is moved to Afghanistan).

Two types of guyed towers are required to support the UHF antennas used to interconnect each BSAA with the HF Base Station. A majority of the sites are located in residential areas. For the most part the building structure occupies from 85-90% of the property area. Most structures are two story with flat roofs. The ability of installing a 50-foot guyed tower, let alone a 100-foot tower is a virtual impossibility. Clearly the use of a self-supporting tower should be considered.

The self-supporting towers require a small concrete base 6'-6" square by 3' deep. This could be easily installed at each site in a manner in which the foundation could be easily covered in the event the tower is relocated. A smaller foundation 5'-9" square can also be employed. The depth of the foundation is increased by 1 foot.

## PESHAWAR SITES

During the survey of Peshawar, it was noted that there was a discernible change in topography between the Pabbi HF Base Station location and the majority of BSAA locations in University Town. The following information was obtained from the listed sources.

### Tactical Pilot Chart, TPC G-6C

- Airport Point of Reference (APR) Peshawar Elevation: 1180 feet
- The Pabbi HF Base Station site is located 25 kilometers from the APR at a bearing of 83° approximately 2 kilometers inside the 1000 foot contour line. This would result in a 180 foot delta between the BSAA sites and Pabbi.

- Based on a Magellan GPS Measurement and additional reference is from the Pearl Hotel to Pabbi, 18.3 kilometers at a bearing of 88°. This measurement was made for reference purposes only.

The other site locations are listed in Table 1, Site Coordinates. In addition, elevation measurements made with a Magellan 5000 are furnished.

### **Combined Joint Operations Graphic 1:250,000 1501C NI-42-8 & NI-42-12**

Table 2, Path Lengths, lists the azimuth and distance between the sites and the HF Base Station at Pabbi. It should be noted that the longest path is from the IMC site which is 30.65 kilometers from Pabbi. The shortest path is 19.2 kilometers from RONCO to Pabbi. The same data for the Quetta sites is also provided in Table 2.

Details of the HF Base Station are provided in **ASTRO** Drawing, PD-1173-1843, AID Communications System, Pabbi HF Base Station Site Plan. The drawing also details the proposed location of the 100-foot UHF tower and the Equipment Building.

### **Site Elevations**

Specific site elevations in the Peshawar area are of great concern. Based on the path lengths, and insufficient elevation data, the size of towers at the BSAA locations and the tower height requirement for the UHF antenna at Pabbi could not be determined while in-country. During the survey a Magellan 5000 GPS mapping grade device was used in Peshawar and Quetta. The device is capable of making 3-dimensional measurements (latitude, longitude, and elevation). According to a number of sources, the unit is designed primarily to provide accurate 2-dimensional data, but questionable elevation data.

### **UHF Path Profile**

Based on the limited information obtained during the survey, and data from various maps, **ASTRO** has been able to estimate a path profile for the BSAA to HF Base Station path. Our worst case profile is based on the following:

- 100 ft. UHF tower at Pabbi.
- 50 ft UHF towers at the BSAA locations, except MSH.
- Maximum path length of 15 miles (24 kilometers)
- Pabbi Elevation - 1000 ft. AMSL
- University Town - 1180 ft. AMSL
- Maximum Tree or Obstruction Height is 30 ft.

A graphic of the profile is furnished in **ASTRO** Drawing PD-1173-1846, Sheet 1, *AID Communications System, UHF Path Profile*.

### Tower Heights

Due to the limited area of each BSAA location **ASTRO** proposes that 50-foot self-supporting towers be located at each BSAA location, except MSH. The MSH location, which is 30 kilometers from Pabbi, will require a 100-foot self-supporting tower to ensure path clearance. Installation of these towers can be achieved with minimal construction work at each site.

#### 3.2.3.2 City Coordinates

Peshawar is located at:

Longitude:	34.00° N
Latitude:	71.55° E
AMSL:	1180 feet <sup>1</sup>
Magnetic Declination <sup>2</sup> :	3.16°

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<sup>1</sup> Based on data obtained from DMAAC TPC G-6C.

<sup>2</sup> The magnetic declination is obtained from the United States Geophysical Survey IGRF.90 data base.

### 3.2.3.2 HF Base Station Location

#### 3.2.3.2.1 General

The Peshawar HF Base Station is located within the RONCO Animal Holding Facility located 20 kilometers due west of Peshawar. The HF base station is interconnected to the agency offices by means of UHF point-to-point, duplex, microwave links. Simply stated, each office is equipped with a UHF radio with an antenna pointed toward the HF base station location at Pabbi. A site designation, P1 has been assigned to this locations.

#### 3.2.3.2.2 Alternate Location

During initial discussions with Guy Bowen, the subject of an alternate location for the HF Base Station was raised. The O/AID/Rep proposed to locate the antenna at his new facility. Clearly the O/AID/Rep was not aware of the type or size of the antenna required by the contract. He was under the impression that a vertical radiator or small dipole would be used. There was some discussion of locating the antenna away from the Grand Trunk Highway in an effort to make the antenna less obvious.

#### 3.2.3.2.3 Pabbi Location

The Pabbi Animal Holding Facility has been renamed the Mine Detection Center (MDC). During the survey, it was determined that the Antenna Products Model LPH-408 antenna can be installed in the "orchard" area directly west of the Mine Detection Center (previously named the Animal Holding Facility).

The proposed site was measured and it was confirmed that the antenna could be installed in the "orchard" area. Measurements of the orchard area were recorded. The results are detailed in **ASTRO** Drawing PD-1173-1843, *Pabbi Transmitter Site Plan*. A photographic record of the entire area was taken. (See Appendix A). Based on the results, it was agreed that the HF base station would be installed at this location.

Since the MDC is scheduled to be turned-over to the United Nations, it was agreed

that a transmitter building must be constructed within the site confines. Based on this requirement, a simplified design was provided to Mr. John Ottenberg on 23 August 92.

Prior to my departing Pakistan, Mr. Guy Bowen (RONCO COP) stated that he would like to have the Maintenance Facility co-located with the HF Transmitter Building to provide a central location for technicians to store spare parts and perform future vehicular installations or repairs. In addition, the area is manned, hence more secure.

Based on this requirement, **ASTRO** provides a simplified plot plan layout, individual room layouts, and furnishings, etc. The new structure will be divided into the following major areas;

- HF Transmitter Room
- Maintenance Work Shop
- Equipment Store Room
- Vehicle Repair Area
- Toilet Facility

**ASTRO** Drawing PD-1173-1847, Pabbi HF Transmitter Building, provides the basic details of the requirements of this structure. A brief description of each room or area is provided below.

### **HF Transmitter Room**

This section of the structure will house the following equipment:

- Two (2) 1 kW HF High Power Amplifier (one unit is spare)
- Two (2) 125W HF Transceiver
- One (1) Personal Computer
- One (1) UHF Transceiver
- One (1) 50A Battery Charger
- Four (4) Storage Batteries

The room will be sub-divided to separate the batteries from the electronic equipment. This will also protect personnel and equipment from the acid out-

gassing from these batteries.

The room will have the following structural attributes;

Internal Measurements:	14 ft. wide x 14 ft. long.
Ceiling Height:	8 ft. (above floor)
Floor:	Concrete slab
Roof:	Pre-fab or poured slab
Walls:	Brick or poured concrete

### **Maintenance Workshop**

This section of the structure will house the workbenches, tools, test equipment, and related equipment necessary to maintain the HF system.

The room will have the following structural attributes;

Internal Measurements:	14 ft. wide x 14 ft. long.
Ceiling Height:	8 ft. (above floor)

### **Equipment Store Room**

This section of the structure will be utilized to store all spare parts and components provided to support the HF system. Shelving should be provide to maximize the storage capacity of this room.

The room will have the following structural attributes;

Internal Measurements:	14 ft. wide x 14 ft. long.
Ceiling Height:	8 ft. (above floor)

### **Vehicle Repair Area**

This exterior section of the structure will be used to perform the installation and/or repair of vehicular installations. The covered roof is intended to provide

protection for personnel from the elements. Tarpaulins can be attached to the support columns for additional protection, if necessary. Exterior walls of the structure shall be fitted with AC receptacles to use electric power tools in this area.

This area will have the following structural attributes;

Internal Measurements:	10 ft. wide x 25 ft. long.
Ceiling Height:	8 ft. (above floor)

### **Toilet Facility**

Since the structure will be located in a separate area, (i.e. the area will be totally separated from the new UN MDC facility) as a minimum, a toilet facility should be provided. As a minimum, the facility should include a western toilet, eastern toilet, and a sink. Final design will rest in the hands of the local architect.

#### **3.2.3.3 BSAA Site Locations**

##### **3.2.3.3.1 General**

There are a total of 12 Base Station Access Arrangements located in the Peshawar area. Contractually only ten (10) sites will be installed. The field office locations for these agencies are listed below. Each site has been assigned an alpha-numeric designator.

- Site P2 - RONCO Consulting Corporation - ALO
- Site P3 - RONCO Consulting Corporation - MDC
- Site P4 - Construction Control Services Corporation (CCSC-ACLU)
- Site P5 - DAI
- Site P6 - Volunteers In Technical Assistance (VITA)
- Site P7 - University of Nebraska at Omaha (UNO)
- Site P8 - ACLU
- Site P9 - Management Sciences for Health (MSH)
- Site P10 - International Rescue Committee (IRC)
- Site P11 - IMC

- Site P12 - CARE
- Site P13 - US AID - AREP/OE<sup>3</sup>
- Site P14 - US AID - TSSP<sup>3</sup>
- Site P15 - HRD (New End-User)

A majority of the sites are located in the south western sector of University Town. This simplifies the installation phase of the BSAA's. The primary issue is the matter of line-of-sight from these locations and the Pabbi HF Base Station location. Inspection of the Peshawar Guide Map, First Edition, 1:15,000 indicates that the general pointing angle for the yagi antennas would be approximately 83°. It should be noted that the UHF links from University Town will cross directly over the Peshawar Airport (joint civil and military operations).

During the inspection of the DAI and VITA offices it was noted that these groups use the Magellan Systems GPS Nav5000 for mapping inside Afghanistan. A unit was borrowed from VITA to aid in the path profiles between the end-users and the HF base station in Pabbi.

The latitudinal and longitudinal data obtained was confirmed by making multiple measurements at the same location. The Nav5000 could not however provide repeatable elevation data at each site, hence the information obtained could only be considered as a reference. A more sophisticated GPS system would be required to obtain accurate site elevations.

A recapitulation of the BSAA equipment distribution is furnished in Table 3. at the end of this report.

#### 3.2.3.3.2 RONCO Area Logistics Office (ALO)

The primary RONCO site is located inside Peshawar city proper. The site is located southeast of the Deans Hotel complex inside the Railway Colony.

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<sup>3</sup> Contractually these locations are identified as optional or add-on sites. Information is gathered to permit installation without performing additional survey tasks at a later date.

Location:  
Latitude: 33° 59" 56'  
Longitude: 71° 32" 53'

No. of BSAA: 1 each  
No. of Telephones: 4 each

### 3.2.3.3.3 RONCO MDC

The BSAA radio and associated HF mobile radios were to be installed as part of the MDC operations. Based on discussions with Mr. Guy Bowen, the MDC project is scheduled to be turned over to the United Nations by June 1993. The BSAA related equipment will be turned over to the RONCO office in Peshawar.

Further discussions with Guy Bowen provided the following details regarding the distribution of the BSAA and mobile radios.

#### **BSAA Location**

The BSAA equipment will be located in John Ottenberg's office at the MDC facility at Pabbi. Final location of the equipment will be determined when the installation team is deployed to Peshawar.

#### **Mobile Radios**

A total of ten (10) mobile HF radios are scheduled for the MDC operation. Per Guy Bowen, five (5) of these units will be installed in MDC vehicles. The remaining five (5) units will be turned over to RONCO HQ for installation in RONCO vehicles that will be used inside Afghanistan. These vehicles will be identified by RONCO when the information is available.

Location:  
Latitude: 34° 00" 50'  
Longitude: 71° 45" 45'

No. of BSAA: 1 each  
No. of Telephones: 4 each

If the decision is made to install a BSAA at the MDC, it will be necessary to attenuate the output power of the UHF radio since the unit will be approximately 200 yards from the HF base station location.

A photographic survey was made during the site visit. Pertinent photographs of the site are provided in Appendix A of this document.

#### 3.2.3.3.5 Construction Control Services Corporation (CCSC-ACLU)

The CCSC organization headquarters is located in the University Town section of Peshawar.

Location:  
Latitude: 33° 59" 48'  
Longitude: 71° 45" 45'

No. of BSAA: 1 each  
No. of Telephones: 4 each

A photographic survey was made during the site visit. Pertinent photographs of the site are provided in Appendix A of this document.

#### 3.2.3.3.5 DAI-NCP

The DAI organization headquarters is located in the University Town section of Peshawar.

Location:  
Latitude: 33° 59" 44'  
Longitude: 71° 29" 37'

No. of BSAA: 1 each  
No. of Telephones: 4 each

A photographic survey was made during the site visit. Pertinent photographs of the site are provided in Appendix A of this document.

#### 3.2.3.3.6 Volunteers In Technical Assistance (VITA)

The VITA organization headquarters is located in the University Town section of Peshawar.

Location:  
Latitude: 33° 59" 23'  
Longitude: 71° 29" 58'

No. of BSAA: 1 each  
No. of Telephones: 4 each

#### 3.2.3.3.7 University of Nebraska at Omaha (UNO)

The UNO organization headquarters is located in the University Town section of Peshawar.

The UNO personnel attending the survey meeting were;

- Mr. Dave Weiler, UNO/ESSP
- Ms. Ramona Klaasmeyer, Finance Officer

Location:  
Latitude: 33° 59" 42'  
Longitude: 71° 30" 12'

No. of BSAA: 1 each  
No. of Telephones: 4 each

#### 3.2.3.3.8 Management Sciences for Health (MSH)

The MSH organization headquarters is located in the University Town section of

Peshawar.

Location:  
Latitude: 33° 59" 43'  
Longitude: 71° 30" 19'

No. of BSAA: 1 each  
No. of Telephones: 4 each

A photographic survey was made during the site visit. Pertinent photographs of the site are provided in Appendix A of this document.

#### 3.2.3.3.9 International Rescue Committee (IRC)

The IRC organization headquarters is located in the University Town section of Peshawar.

Location:  
Latitude: 33° 59" 51'  
Longitude: 71° 29" 83'

No. of BSAA: 1 each  
No. of Telephones: 4 each

A photographic survey was made during the site visit. Pertinent photographs of the site are provided in Appendix A of this document.

#### 3.2.3.3.10 IMC

The IMC organization headquarters is located at a site named Nasir Barg. The IMC BSAA site is the furthest from the Pabbi HF Base Station location. It is located in a large facility which houses a medical training center, administrative buildings, and medical warehousing facilities. The property is leased from a local landlord directly by IMC (not an AID lease).

Location:

Latitude: 34° 02" 26'  
Longitude: 71° 25" 53'

No. of BSAA: 1 each  
No. of Telephones: 4 each

A photographic survey was made during the site visit. Pertinent photographs of the site are provided in Appendix A of this document.

#### 3.2.3.3.11 CARE

The CARE organization headquarters is located in the University Town section of Peshawar.

Location:  
Latitude: 33° 59" 25'  
Longitude: 71° 28" 51'

No. of BSAA: 1 each  
No. of Telephones: 4 each

#### 3.2.3.3.12 US AID - AREP/OE

The US AID organization headquarters is located in the University Town section of Peshawar. Based on discussions held with the AREP and RONCO, the BSAA equipment for this organization will be purchased by AID directly from ASTRO.

Location:  
Latitude: 33° 59" 28'  
Longitude: 71° 29" 24'

No. of BSAA: 1 each  
No. of Telephones: 4 each

A photographic survey was made during the site visit. Pertinent photographs of the site are provided in Appendix A of this document.

### 3.2.3.3.13 US AID - TSSP

The Technical Support Special Project organization is not an officially formed group to date. Based on discussions held with the AREP and RONCO, the BSAA equipment for this organization will be purchased by AID directly from ASTRO.

Location:

Latitude: To Be Determined

Longitude: To Be Determined

No. of BSAA: 1 each

No. of Telephones: 4 each

Mr. Guy Bowen advised that HRD was one of the new end-users that may join the HF network. Although not a participant in the initial contract order, a survey was performed at the HRD facility, which is currently being renovated. During the meeting the quantity of equipment would be distributed as follows.

- One (1) BSAA to be installed in Peshawar
- One (1) BSAA to be installed in Quetta
- Four (4) vehicles in Peshawar
- Four (4) fixed stations in Afghanistan

Details for the Peshawar HRD equipment are identified below.

#### **HRD BSAA - Peshawar**

The location of the BSAA equipment and the four telephone units were discussed.

Installation of an antenna support or tower will be a big problem at this site. There is no earth in the HRD compound that would permit the placement of a self-supporting antenna tower. Due to the physical layout of the buildings there are only a few locations at which a tower can be installed.

A photographic survey was made during the site visit. Pertinent photographs of the site are provided in Appendix A of this document.

## **HRD Mobile Vehicles**

The following vehicles will require mobile radio installations. All vehicles are located in Peshawar.

- One (1) Pajero
- One (1) Mitsubishi Double Cab Pickup
- One (1) Chevrolet Pickup (by year end)
- One (1) Chevrolet Suburban (by year end)

## **HRD Fixed HF Stations**

Four (4) HF Fixed Stations are required inside Afghanistan. HRD will select the four (4) sites from the locations identified below.

### Existing Sites

- Ghazni
- Maroof

### Planned or Future Sites

- Wardak
- Quandahar
- Ningrahar
- Herat

### 3.2.3.4 Mobile Radio Details

#### 3.2.3.4.1 Introduction

Each agency identified in paragraph 3.2.3.3 operates a number of vehicles or mobile units.

During the survey of each end-user's facility, the end-user's vehicles were inspected and photographed. As previously discussed, there are a number of organizations that desire the installation of a fixed HF radio at various locations within Afghanistan. End-users desire a radio configuration that can be packaged

in such a manner as to make the installation of the units straight-forward and simple. There are two configurations that are desired, 1) a system powered from a small gas powered generator, and 2) a system which is powered from a solar panel configuration. A recapitulation of the mobile HF equipment distribution is furnished in Table 3 at the end of this report. Prior to departure, a listing of the Peshawar sites was presented to RONCO.

The discussion and distribution of radio systems for each end-user is detailed in the following section of the report.

#### 3.2.3.4.2 RONCO ALO

Contractually, RONCO has been allocated a total of twelve (12) mobile units. Discussions with John McHale on 13 August 92 indicated that two (2) of the mobile radios would be installed in a long-wheel base and one (1) short-wheel base Toyota. The balance of mobile radios were supposed to be installed in vehicles assigned to the Mine Detection Center in Pabbi. Due to the pending turnover of the facility to the UN, the installation of mobile radios has been temporarily suspended.

Mobile HF Radios	1 each
Fixed HF Radios	1 each
Transportable HF Radios	1 each

#### 3.2.3.4.3 RONCO MDC

The ten (10) mobile radios for the Mine Detection are to be distributed as follows.

Mobile HF Radios	10 each
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Five (5) units will be installed in vehicles to be identified. It should be noted that MDC is the one end-user that employs the use of large trucks. They also have a Nissan Patrol 4-wheel drive jeep. Five (5) units will be transferred to RONCO ALO for vehicles to be identified.

### 3.2.3.4.5 Construction Control Services Corporation (CCSC-ACLU)

Discussions with CCSC indicated that they do not desire mobile radio installations in their vehicles. Due to the nature of their in-country operations, they requested a transportable configuration of the mobile radio.

Mobile HF Radios	0 each
Fixed HF Radios	0 each
Transportable HF Radios	7 each

Based on discussions with CCSC and other end-users, the transportable configuration consist of the following:

- one (1) fiberglass transit case with front and rear cover.
- one (1) DC wiring harness to interface with the vehicle DC wiring.
- one (1) whip antenna assembly to be installed on the end-users vehicle.

CCSC stated they would provide the modified vehicle wiring harness if **ASTRO** would identify the appropriate mating plug. In addition, CCSC would modify each vehicle with method of securing the transit case in the bed of the vehicle.

### 3.2.3.4.5 DAI

DAI is one of the end-users that desires the fixed station configuration. In an effort to maintain configuration control, **ASTRO** proposes that the fixed station be installed in an identical transit case as the one selected for the transportable units.

Mobile HF Radios	0 each
Fixed HF Radios	8 each
Transportable HF Radios	0 each

The fixed station configuration would consist of the following items or components.

- one (1) radio and tuner,
- one (1) fiberglass transit case with front and rear cover,
- one (1) battery charger,

- one (1) battery,
- one (1) DC wiring harness to interface battery to charger,
- one (1) ground rod, and
- one (1) antenna assembly.

#### 3.2.3.4.6 Volunteers In Technical Assistance (VITA)

VITA is one of the end-users which desires the fixed HF station configuration. During the meeting the number of units ordered and desired were reviewed.

Mobile HF Radios	1 each
Fixed HF Radios	7 each
Transportable HF Radios	0 each

The fixed station configuration would consist of the following items or components.

- one (1) radio and tuner,
- one (1) fiberglass transit case with front and rear cover,
- one (1) battery charger,
- one (1) battery,
- one (1) DC wiring harness to interface battery to charger,
- one (1) ground rod, and
- one (1) antenna assembly.

The mobile HF radio is tentatively scheduled to be installed in a long wheel-based Toyota.

Specific site locations were not identified.

#### 3.2.3.4.7 University of Nebraska at Omaha (UNO)

UNO is one of the end-users which desires the fixed HF station configuration. During the meeting the number of units ordered and desired were reviewed.

Mobile HF Radios	4 each
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Fixed HF Radios	4 each
Transportable HF Radios	0 each

Fixed HF radios would be installed at the UNO Teacher Training Sites at:

Kabul (ECA)  
Herat  
Kandahar  
Ghazni

The fixed station configuration would consist of the following items or components.

- one (1) radio and tuner,
- one (1) fiberglass transit case with front and rear cover,
- one (1) battery charger,
- one (1) battery,
- one (1) DC wiring harness to interface battery to charger,
- one (1) ground rod, and
- one (1) antenna assembly.

#### 3.2.3.4.8 Management Sciences for Health (MSH)

MSH is one of the end-users which desires the fixed HF station configuration. During the meeting the number of units ordered and desired were reviewed.

Mobile HF Radios	2 each
Fixed HF Radios	4 each
Transportable HF Radios	0 each

MSH has been in Pakistan for 5½ year developing basic health services throughout unoccupied Afghanistan. It is expected that the four fixed stations would be located in four principal provinces as liaison offices.

The fixed station configuration would consist of the following items or components.

- one (1) radio and tuner,
- one (1) fiberglass transit case with front and rear cover,

- one (1) battery charger,
- one (1) battery,
- one (1) DC wiring harness to interface battery to charger,
- one (1) ground rod, and
- one (1) antenna assembly.

#### 3.2.3.4.9 International Rescue Committee (IRC)

Contractually, IRC has been allocated five (5) mobile radio units. There are two primary end-user organizations within IRC, 1) Rehabilitation Program for Afghanistan (RPA) and 2) the Rural Assistance Program (RAP).

Mobile HF Radios	3 each
Fixed HF Radios	1 each
Transportable HF Radios	0 each

RAP requested vehicular installations for the two (2) Toyota Hilux Crew Cab pickup trucks

The RPA group has been allocated the remaining three units. They desire to have one (1) mobile installation, one (1) fixed station package for a site located in Darsaman, and the last unit to be a portable or tactical unit which could be moved from a vehicle to a temporary site location during the execution of short term programs inside Afghanistan. They have a number of different vehicles which they would like to move the radio from vehicle to vehicle. This would require outfitting each vehicle with an antenna, a special DC wiring harness which would permit the easy installation and removal of the radio package.

#### 3.2.3.4.10 IMC

IMC intends to have two (2) mobile radios installed and use the third radio as a spare or backup. They requested that a third vehicle be equipped and prepared for the easy installation of the spare unit in case they lose one of the primary units.

Mobile HF Radios	3 each
Fixed HF Radios	0 each
Transportable HF Radios	0 each

IMC currently has a Toyota Hilux pickup truck and a Toyota Land Cruiser.

#### 3.2.3.4.11 CARE

The end-user desires to have the HF equipment distributed as follows:

Mobile HF Radios	0 each
Fixed HF Radios	2 each
Transportable HF Radios	0 each

Presently CARE operations are located in the following Afghan Provinces:

Urzgan  
Paktika  
Khost  
Paktia

Two locations were identified for the fixed HF radios, Urgun, Paktika Province, Afghanistan and Maidan Shar, Wardak Province, Afghanistan which are 527 km and 320 km from Peshawar.

#### 3.2.3.4.13 US AID - AREP/OE

The end-user desires to have the HF equipment distributed as follows:

Mobile HF Radios	3 each
Fixed HF Radios	1 each
Transportable HF Radios	0 each

Based on discussions with the COP, it is expected that the mobile HF radios will be installed in an existing Toyota Land Cruiser, a Mitsubishi L200 dual cab pickup truck and a Chevrolet Suburban vehicle. The fixed unit would be used in the event

an immediate move into Kabul is authorized. This would provide AID with a quick-response capability.

The fixed station configuration would consist of the following items or components.

- one (1) radio and tuner,
- one (1) fiberglass transit case with front and rear cover,
- one (1) battery charger,
- one (1) battery,
- one (1) DC wiring harness to interface battery to charger,
- one (1) ground rod, and
- one (1) antenna assembly.

#### 3.2.3.4.14 US AID - TSSP

The end-user desires to have the HF equipment distributed as follows:

Mobile HF Radios	1 each
Fixed HF Radios	1 each
Transportable HF Radios	1 each

The mobile HF radio is scheduled to be installed in a Chevrolet Suburban vehicle. The transportable unit would be used in the event an immediate move into Kabul is authorized. This would provide AID with a quick-response capability.

#### 3.2.3.5 Technician Candidates

##### 3.2.3.5.1 Interviews

During the visit to Peshawar, the following personnel were interviewed for the position as system technician.

- Candidate 1 - Mohamadullah
- Candidate 2 - Nike Mohammed
- Candidate 3 - Abdul Wakil
- Candidate 4 - Abdul Raqib
- Candidate 5 - Khan Mohammad

### Candidate 6 - Haji Mohammad Asif (Current RONCO Employee)

In addition to the personnel interviewed in Peshawar, the following personnel were interviewed in Islamabad.

### Candidate 7 - Ehsanullah Aslamzadah

Based on the results of interviews and review of the candidates resumes, the following candidates have been selected for the training program.

Candidate 1

Candidate 2

Candidate 3

Candidate 5

#### 3.2.3.5.2 Quetta Technicians

**ASTRO** suggests that RONCO consider selecting a small group of Afghan technicians to provide a maintenance and installation capability in Quetta. Deploying technicians from Peshawar to Quetta will be a time-consuming and costly enterprise. Based on the results of the interviews of the technician candidates in Peshawar, locating 3 or 4 Afghan technicians in Quetta would not appear to be a problem. **ASTRO** would propose to provide them on-the-job training during the installation phase in Quetta.

#### 3.2.3.5.3 End-User Employees

Since a number of the end-users have selected a fixed station or transportable radio configuration, **ASTRO** proposes that each end-user nominate an employee who would participate in the on-the-job training period with the Afghan technicians. Training would cover the installation and de-installation of the transportable equipment and in some cases the mobile radios. This will permit equipment relocation without having to utilize the technicians for this activity, and provide a measure of troubleshooting to identify problems which may develop at these remote locations.

### 3.3 QUETTA, PAKISTAN

#### 3.3.1 Introduction

#### 3.3.2 Administrative Matters

Note: The phone and fax prefix for Quetta is 081.

DAI/Q  
31-A Chaman Housing Scheme  
Quetta  
Phone: 77424, 7821  
Fax: 76114  
Point of Contact: Col. Saadulah

VITA/Q  
F-103, Block 5  
Satellite Town, Quetta  
Phone: 42489  
Fax: 40671  
Point of Contact:

UNO/Q  
82-E, Block 5  
Satellite Town, Quetta  
Phone: 42237  
Fax: 41631  
Point of Contact:

MSH/Q  
House #204-K, Block 5  
Satellite Town, Quetta  
Phone: 41277  
Fax: None  
Point of Contact:

AID/REP/P  
House C-54

Railway Housing Society, Quetta  
Phone: 42489  
Fax: 42821  
Point of Contact:

RONCO/Q  
81-A Chaman Housing Scheme  
Airport Road, Quetta  
Phone: 70972  
Fax: 73852  
Point of Contact: Mr. Earl Theime, Area Logistics Officer

HRD/Q  
No site location had been established by HRD during the survey of Quetta.

### 3.3.3 Civil Engineering Matters

#### 3.3.3.1 City Coordinates

Quetta is located at:

Longitude:	30.22° N
Latitude:	67.00° E
AMSL:	5,250 feet <sup>4</sup>
Magnetic Dec.	1.23°

#### 3.3.3.2 HF Base Station Location

No location for the Quetta HF Base Station was established during previous surveys. Based on the physical dimensions of the Antenna Products Model LPH-0408, the desired operating azimuth angle, and discussions with the RONCO and AID representatives, a location at the DAI Warehouse Facility No.2 was selected for the Quetta Base Station Facility. Selection of this site was based primarily on

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<sup>4</sup> Based on data obtained from DMAAC ONC H-8.

the fact that there was no other property leased by AID or RONCO that could meet the size requirements for the specified antenna.

Since this is the largest area available a plot plan drawing was developed during the survey period in Quetta. The CAD symbol of the antenna was then inserted into the drawing to make a preliminary assessment of the property. RONCO and AID were advised that based on this drawing there would be a need to "fit" the antenna into this area. See ASTRO Drawing PD-1173-1844. Basically a problem exists with the guy wire locations for the antenna. The drawing indicates that two guys would be placed outside the existing wall which surrounds the facility.

The HF base station is interconnected to the agency offices by means of UHF point-to-point, duplex, microwave links. Simply stated, each office is equipped with a UHF radio with an antenna pointed toward the HF base station location at DAI Warehouse No. 2. A site designation, Q1 has been assigned to this location.

## **QUETTA SITES**

### **Joint Operations Graphic (Air), 1501AIR NH-42-5**

- Airport Point of Reference (APR) Quetta Elevation: 5250 feet

### **Quetta Guide Map 1:200,000**

- The HF Base Station site is located approximately 5.3 kilometers south east of the APR at a bearing of 120°.
- Majority of sites are located in Satellite town. A reference AMSL on the map approximately 2.5 kilometers north northwest is 1681 meters or (5513 feet). This results in a 263 foot delta between Satellite Town and the airport. Further inspection of the map indicates that the proposed HF site is at an elevation of approximately 5400 feet.

The other site locations are listed in Table 1, Site Coordinates. In addition, elevation measurements made with a Magellan 5000 are furnished. Table 2, Path Lengths, lists the azimuth and distance between the sites and the HF Base Station at the DAI Warehouse Facility No. 2.

## HF Base Station Location

During the Quetta survey, two locations were presented for the HF Base Station antenna. Upon inspection of sketches, the first location was determined to be too small. The second site appeared to be a better location. Measurements were made, and a rough-drawing was developed in Quetta. The results indicate that the antenna can be fitted into the available space with some modifications to the antenna. Details of this site are provided in **ASTRO** Drawing PD-1173-1844, Quetta HF Base Station Site Plan.

Location:

Latitude: 30° 13" 47'

Longitude: 67° 00" 04'

Two (2) guy wires, used to support the antenna tower, are located outside the site wall. One guy is over 29 feet from the wall while the second is approximately 17 feet outside the wall. To relocate these guy points inside the existing facility will require re-engineering. In addition, the tie point for one of the catenary supports and another tower guy point fall directly on the concrete apron which surrounds the existing building. The method of placing the catenary and guy anchors will require removal of the existing concrete, excavation, and placement of the guy anchors.

Due to the limited space, it will be impossible to install a separate tower to support the UHF antenna, hence we would propose to use one of the 75-ft. support towers of the HF antenna.

## Path Profile

Based on the information obtained during the survey, and data from various maps, and the fact that the maximum distance between the sites is 7.5 kilometers, **ASTRO** feels that it is feasible to utilize towers with a maximum of thirty feet. Our worst case profile is based on the following:

- 75 ft. UHF tower at the HF Base Station Location.
- 30 ft UHF towers at the BSAA locations.
- Maximum path length of 4.4 miles (7 kilometers)

- DAI Warehouse Elevation - 5400 ft. AMSL
- Satellite Town - 5500 ft. AMSL
- Obstruction Height is 30 ft. or less.

A graphic of the profile is furnished in **ASTRO** Drawing PD-1173-1846, AID Communications System, UHF Path Profile, Sheet 2

## **Tower Heights**

A similar problem of available space to install a guy-supported antenna exists in Quetta. Due to the limited area of each BSAA location, **ASTRO** proposes that 30-foot self-supporting towers be located at each BSAA location. Installation of these towers can be achieved with minimal construction work at each site.

### 3.3.3.3 BSAA Site Locations

#### 3.3.3.3.1 Introduction

There are a total of six (6) Base Station Access Arrangements located in the Quetta area. Contractually only five (5) sites will be installed. The field office locations for these agencies are listed below. Each site has been assigned an alpha-numeric designator.

- Site Q2 - RONCO ALO
- Site Q3 - DAI-NCP
- Site Q4 - Volunteers In Technical Assistance (VITA)
- Site Q5 - University of Nebraska at Omaha (UNO)
- Site Q6 - Management Sciences for Health (MSH)
- Site Q7 - US AID - TSSP<sup>5</sup>
- Site Q8 - HRD (New End-User)

A recapitulation of the BSAA equipment distribution is furnished in Table 3 at the

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<sup>5</sup> Contractually this location is identified as optional or add-on site. Information is gathered to permit installation without performing additional survey tasks at a later date.

end of this report.

### 3.3.3.3.2 RONCO

The RONCO facility is located north of the proposed location for the HF Base Station. This location can also be utilized to store the installation material for all sites until the Quetta installation phase begins. A large warehouse could be utilized if coordinated with RONCO.

Location:	
Latitude:	30° 13" 47'
Longitude:	67° 00" 04'
No. of BSAA:	1 each
No. of Telephones:	2 each

A photographic survey was made during the site visit. Pertinent photographs of the site are provided in Appendix B of this document.

### 3.3.3.3.3 DAI-NCP

Location:	
Latitude:	30° 13" 26'
Longitude:	67° 00" 01'
No. of BSAA:	1 each
No. of Telephones:	2 each

A photographic survey was made during the site visit. Pertinent photographs of the site are provided in Appendix B of this document.

3.3.3.3.4 Volunteers In Technical Assistance (VITA)

Location:  
Latitude: 30° 09" 28'  
Longitude: 66° 59" 55'

No. of BSAA: 1 each  
No. of Telephones: 1 each

A photographic survey was made during the site visit. Pertinent photographs of the site are provided in Appendix B of this document.

3.3.3.3.5 University of Nebraska at Omaha (UNO)

Location:  
Latitude: 30° 09" 28'  
Longitude: 66° 59" 22'

No. of BSAA: 1 each  
No. of Telephones: 1 each

A photographic survey was made during the site visit. Pertinent photographs of the site are provided in Appendix B of this document.

3.3.3.3.6 Management Sciences for Health (MSH)

Location:  
Latitude: 30° 09" 31'  
Longitude: 67° 00" 10'

No. of BSAA: 1 each  
No. of Telephones: 2 each

A photographic survey was made during the site visit. Pertinent photographs of

the site are provided in Appendix B of this document.

#### 3.2.3.3.7 US AID - TSSP

Location:	
Latitude:	30° 09" 28'
Longitude:	66° 59" 55'
No. of BSAA:	1 each
No. of Telephones:	1 each

A photographic survey was made during the site visit. Pertinent photographs of the site are provided in Appendix B of this document.

#### 3.2.3.3.8 HRD

The HRD personnel were in the process of selecting a site for their Quetta operations. Finalization of BSAA installations can be accomplished when the installation team moves to Quetta,

Location:	
Latitude:	To Be Determined
Longitude:	To Be Determined
No. of BSAA:	1 each
No. of Telephones:	4 each

#### 3.3.3.4 Mobile Radio Locations

##### 3.3.3.4.1 Introduction

During the survey of each end-user's facility, the end-user's vehicles were inspected and photographed. As previously discussed, there are a number of organizations that desire the installation of a fixed HF radio at various locations within Afghanistan. End-users desire a radio configuration that can be packaged

in such a manner as to make the installation of the units straight-forward and simple. There are two configurations that are desired, 1) a system powered from a small gas powered generator, and 2) a system which is powered from a solar panel configuration. A recapitulation of the mobile HF equipment distribution is furnished in Table 3 at the end of this report. Prior to departure, a listing of the Quetta sites was presented to RONCO.

The discussion and distribution of radio systems for each end-user is detailed in the following section of the report.

#### 3.3.3.4.2 RONCO

The end-user desires to have the HF equipment distributed as follows:

Mobile HF Radios	3 each
Fixed HF Radios	0 each
Transportable HF Radios	0 each

Currently RONCO has a Nissan Patrol and a Mitsubishi Pajero.

#### 3.3.3.4.3 DAI-NCP

The end-user desires to have the HF equipment distributed as follows:

Mobile HF Radios	0 each
Fixed HF Radios	2 each
Transportable HF Radios	0 each

The fixed station configuration would consist of the following items or components.

- one (1) radio and tuner,
- one (1) fiberglass transit case with front and rear cover,
- one (1) battery charger,
- one (1) battery,
- one (1) DC wiring harness to interface battery to charger,
- one (1) ground rod, and

- one (1) antenna assembly.

#### 3.3.3.4.4 Volunteers In Technical Assistance (VITA)

The end-user desires to have the HF equipment distributed as follows:

Mobile HF Radios	0 each
Fixed HF Radios	2 each
Transportable HF Radios	0 each

The fixed station configuration would consist of the following items or components.

- one (1) radio and tuner,
- one (1) fiberglass transit case with front and rear cover,
- one (1) battery charger,
- one (1) battery,
- one (1) DC wiring harness to interface battery to charger,
- one (1) ground rod, and
- one (1) antenna assembly.

#### 3.3.3.4.5 University of Nebraska at Omaha (UNO)

The end-user desires to have the HF equipment distributed as follows:

Mobile HF Radios	2 each
Fixed HF Radios	0 each
Transportable HF Radios	0 each

Based on information obtained in Quetta, the two vehicles are expected to be a Nissan pickup and a Chevrolet, two door, crew cab, pickup.

#### 3.3.3.4.6 Management Sciences for Health (MSH)

The end-user desires to have the HF equipment distributed as follows:

Mobile HF Radios	2 each
Fixed HF Radios	0 each
Transportable HF Radios	0 each

MSH is currently renting two vehicles. It is expected that these units would be replaced by the time installation activity began in Quetta.

#### 3.2.3.4.7 US AID - TSSP

The end-user desires to have the HF equipment distributed as follows:

Mobile HF Radios	1 each
Fixed HF Radios	1 each
Transportable HF Radios	0 each

The mobile radio will be installed in a Toyota Land Cruiser.

The fixed station configuration would consist of the following items or components.

- one (1) radio and tuner,
- one (1) fiberglass transit case with front and rear cover,
- one (1) battery charger,
- one (1) battery,
- one (1) DC wiring harness to interface battery to charger,
- one (1) ground rod, and
- one (1) antenna assembly.

#### 3.2.3.4.8 HRD

Based on the information obtained from the end-user in Peshawar, the HF equipment will be distributed as follows:

Mobile HF Radios	2 each
Fixed HF Radios	0 each
Transportable HF Radios	0 each

Actual vehicle models or makes are unknown at this time.

### 3.3 OPERATIONAL FREQUENCIES

#### 3.3.1 General

A limited number of operational frequencies are available for the system. These are identified as an extension of the AID Pakistan program. Additional frequencies which may be considered are existing operating networks such as the United Nations High Commissioner for Refugee Affairs and the Afghan Mujahideen.

Mobile to mobile and fixed to mobile radio operation within Afghanistan should be accomplished at frequencies in the 20 to 25 Mhz range. **ASTRO** proposes that mobile and fixed radios be programmed to operate at these frequencies only inside Afghanistan since no limitations or problems are expected from Afghan governmental organizations. Actual frequencies will be selected and programmed based on in-country (Afghanistan) frequency scans.

#### 3.4.2 US AID

The following HF frequencies are currently being utilized by AID Pakistan. These will be the primary operating frequencies for existing HF system.

5890.0 kHz  
8037.5 kHz<sup>6</sup>  
12070.0 kHz  
13375.0 kHz

These frequencies would become the primary frequencies for the HF base station transmitter and receiver.

#### 3.4.3 UNHCR

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<sup>6</sup> Normally monitored.

Based on information obtained from previous survey reports, the UNCHR is operating within Pakistan and Afghanistan on the following frequencies.

2659.0 kHz	6260.0 kHz
3207.0 kHz	6475.0 kHz
4615.0 kHz	7395.0 kHz
4915.0 kHz	7667.0 kHz
5025.0 kHz	8257.0 kHz <sup>6</sup>

In addition to the in-country frequencies, the following international frequencies for operation to/from Geneva are utilized.

4090.0 kHz	9845.0 kHz
4615.0 kHz	14405.0 kHz
5025.0 kHz	14478.0 kHz
6260.0 kHz	17565.0 kHz
6475.0 kHz	19313.0 kHz
7395.0 kHz	19821.5 kHz
9004.0 kHz	20734.0 kHz <sup>6</sup>

To provide the ability of operating on these frequencies, AID should coordinate with the UNHCR prior to use.

#### 3.4.4 Afghan Mujahideen

AID personnel in Quetta stated that on a number of occasions, information was transmitted from Afghanistan to Quetta by the Afghan Mujahideen. Some end-users asked if it was feasible to monitor or utilize these frequencies for emergency operation. Personnel were advised that this would be feasible, if **ASTRO** was advised of the operating frequencies.

#### 3.4.5 Final Frequency Assignments

The HF radios have the capability of scanning a total of 10 frequencies. Prior to

the completion of the Peshawar and Quetta base station facilities, RONCO must provide a list of the ten (10) operational frequencies to permit programming the HF receivers.

It is proposed that the radios be programmed with the four (4) US AID frequencies, four (4) UNHCR frequencies as backup, and two (2) frequencies to be determined.

### 3.5 ISSUES

#### 3.5.1 General

During the performance of the survey a number of issues requiring resolution were noted.

#### 3.5.2 Issue 1 - Guyed vs. Self-Supporting Towers

This issue is addressed in section 3.2.3.2.2 and 3.3.3.2.

#### 3.5.3 Issue 2 - Tower Heights

This issue is addressed in section 3.2.3.2.2 and 3.3.3.2.

#### 3.5.4 Issue 3 - Fixed and/or Transportable HF Radios

During a meeting with the end-user COPs (Chief of Party) or their representative, it was revealed that a number of the groups have sites already established inside Afghanistan. These organizations desired a fixed HF radio to be installed at these locations. One organization, CCSC, stated that they would prefer to have a unit which could be transported in their vehicles or placed in a fixed location since their construction programs are of a varied duration (3 weeks to three months at a job site). This requirement could be best served by providing a transportable HF radio configuration, which is operated solely from the vehicle.

The change from mobile to fixed or transportable will require the end-users to provide additional funding. Costs for the two configurations would be based on the addition of the following items or components.

### **Fixed HF Station**

1. one (1) transit case for the HF transceiver and tuner,
2. one (1) dipole or long-wire antenna,
3. one (1) 12 vdc power cable assembly,
4. one (1) 12 vdc power sources listed below;
  - a. If AC power is available a battery charger and 12 VDC battery.
  - b. If no AC power is available, a solar panel kit.

### **Transportable HF Radio**

1. one (1) transit case for the HF transceiver and tuner,
2. one (1) vehicular whip antenna,
3. one (1) dipole or long-wire antenna,
4. one (1) 12 vdc power cable assembly to interface with vehicle wiring,

*Note:* The end-user stated that they would provide a modified wiring harness to interface with the transceiver 12 vdc power cable assembly, and would equip each vehicle with tie-down points and straps once the dimensions of the transit case were available.

### **3.5.5 Issue 4 - End-User Operation Plan.**

A number of the end-users were concerned that all system users would not have the same amount of access time to the network. It was explained that due to the number of BSAs and the two HF base stations, it would be necessary to develop an overall operation plan. This plan would address:

- Manning requirements for each end-user at Peshawar and Quetta.
- Transmission scheduling at both locations.
- Develop and maintain system operating procedures (SOPs).
- Coordinate maintenance and repair actions after contract warranty period.

### 3.5.6 Issue 5 - Maintenance Personnel In Quetta

Utilizing the Peshawar Afghan technicians to provide installation and maintenance support in the Quetta area would be an expensive operation. RONCO should consider selecting Afghan technicians in the Quetta area. Due to the smaller quantity of fixed and mobile radio installations, the smaller quantity of BSAAAs, it is envisioned that a cadre of 3 men would be sufficient.

### 3.5.7 Issue 6 - Training End-User Personnel

Since a number of the end-users desired a fixed HF radio for current operations in Afghanistan it is clear that their personnel should be familiar with all components of the fixed HF radio system. These personnel should receive OJT in the following areas:

- Familiarity with system parts
- Equipment set-up
- Equipment operation
- Non-technical troubleshooting
- Antenna siting period.

This training would be provided in Peshawar and Quetta.

### 3.5.8 Issue 7 - BSAA Batteries

Lead-acid batteries normally vent gases during the charging cycle. Since a majority of the sites in Peshawar and Quetta are residential structures, the use of these batteries could cause fumes and gases which are considered irritants. No sites have spare rooms or closets which could be equipped with fans to ventilate the fumes.

Placement of batteries at the transmitter site at Pabbi does not present an issue since it is proposed that a new building be constructed. Part of the design of this building includes a separate battery room. (see section 3.2.3.2.3)

### 3.5.9 Issue 8 - Pabbi Transmitter Building

Based on information obtained during the survey, it will be necessary to have a transmitter building constructed on the property which will house the HF base station antenna at Pabbi. See Section 3.2.3.2.3. for a specific discussion regarding this matter.

### 3.5.10 Issue 9 - Maintenance Facility

Since it was agreed that a transmitter building must be constructed at the Pabbi site, RONCO suggested that this would serve as the same location for post-installation maintenance facility. Based on this requirement, **ASTRO** included a maintenance room and storage rooms as part of the Pabbi transmitter design. (See section 3.2.3.2.3 for details).

### 3.5.10 Issue 10 - Storage in Peshawar City

In an effort to reduce equipment repair it is proposed that a storage facility be located in Peshawar City. Since a majority of sites are located in University Town this would reduce travel time for the maintenance personnel. Using the RONCO site in Peshawar City was discussed.

### 3.5.11 Issue 11 - Quetta HF Base Station Antenna

Upon arrival in Quetta the primary site proposed for the antenna was surveyed. Measurements were made and a CAD drawing was prepared to determine the feasibility of installing the specified antenna. Specific details of the antenna location are discussed in section 3.3.3.2. AID and RONCO personnel stated that it would be very difficult to find another location as this would require leasing another property.

### 3.5.13 Issue 12 - Modifications of Nasir Pur Maintenance Facility

Although the Pabbi Maintenance Facility can be used for the initial installation and storage of the mobile radio units, it clearly needs a great deal of work to make it usable. These modifications or upgrades should be made prior to starting any in-country mobile radio installations. The Nasir Pur facility was surveyed on 23 Aug 92 with Mr. John McHale.

A covered area currently used to house grain would provide sufficient area to permit the installation of two (2) mobile radio units at the same time. This area requires the addition of electrical service along the rear wall and on one of the support columns. Two (2) stalls provide about 400 sq. feet of space which should accommodate the end-users vehicles. A ramp must be constructed in front of each stall to allow easy access to the work area. It was agreed that tarpaulins could be used to cover the area in the event of rain.

Adjacent to this covered area is a "storage" room of approximately 700 square feet. It was agreed that this area would be used to store the mobile radio equipment and the BSAA equipment once the room was properly enclosed and air conditioned. In addition, electrical service in this room will be required.

#### 3.5.14 Issue 13 - Location Of Radio Equipment In End-User Vehicles

During the survey, most end-user vehicles were inspected. In addition, there was an opportunity to inspect UNHCR and AID Pakistan vehicles. Observations of the vehicle inspections are provided below.

- A number of vehicles are pickup trucks or crew cab pickup trucks. Dash mounting the radio and tuner in these vehicles will eliminate the space in the passenger side. Very little room is available behind either the driver or passenger seat for the radio components.
- A number of vehicles are Toyota or Nissan 4-wheel drive trucks. Dash mounting the radio and tuner in these vehicles will also virtually eliminate space in the passenger side.

In both cases, consideration should be made to using remote control heads, placing the radio equipment in the rear of the vehicle. Radios installed in the back of pickup trucks would require cover to protect against the elements.

### 3.5.15 Issue 14 - Responsible Agency for System Operation

The complexity of the AID Pakistan HF system will require the selection of an in-country agency that will be responsible for the day-to-day operation of the system. This organization should develop the system operation plan.

**Table 1**  
**Site Coordinates**

<b>Site No.</b>	<b>Location</b>	<b>Lat.</b>	<b>Long.</b>	<b>Elev (ft)</b>
<b>PESHAWAR</b>				
1	HF Base	34 00 50	71 45 45	1017
2	RONCO	33 59 56	71 32 53	1535
3	MDC	34 00 50	71 45 45	1017
4	CCSC	33 59 48	71 29 36	1153
5	DAI	33 59 44	71 29 37	1153
6	VITA	33 59 23	71 29 58	1144
7	UNO	33 59 42	71 30 12	1231
8	MSH	33 59 43	71 30 19	1144
9	IRC	33 59 51	71 29 83	1011
10	IMC	34 02 26	71 25 53	1234
11	CARE	33 59 25	71 28 51	1079
12	OAID/Rep	33 59 28	71 29 24	1186
13	OAID/TSSP	To Be Determined		
14	HRD	33 59 20	71 29 54	1038
15	Nasir Pur	33 59 15	71 25 49	1361
16	Hyatabad	34 00 51	71 45 44	1142
<b>QUETTA SITES</b>				
1	HF Site	30 13 47	67 00 04	5114
2	RONCO	30 14 08	66 59 50	5443
3	DAI	30 13 26	67 00 01	5075
4	VITA	30 09 28	66 59 55	5360
5	UNO	30 09 29	66 59 52	5358
6	MSH	30 09 31	67 00 10	5755
7	AID/Rep	30 09 28	66 59 55	5360
8	HRD	To Be Determined		

**Table 2**  
**Path Lengths**

<b>Site No.</b>	<b>MDC to</b>	<b>Path (km)</b>	<b>Bearing</b>
<b>PESHAWAR</b>			
1	HF Base	0	0
2	RONCO	19.82	83
3	MDC	0	0
4	CCSC	24.85	83
5	DAI	24.86	83
6	VITA	24.37	82
7	UNO	23.97	83
8	MSH	23.78	83
9	IRC	24.92	83
10	IMC	30.65	93
11	CARE	26.07	82
12	OAID/Rep	25.23	82
13	OAID/TSSP	TBD	
14	HRD	24.48	81
<b>QUETTA</b>			
1	HF Site	0	0
2	RONCO	0.78	159
3	DAI	0.58	356
4	VITA	7.94	0
5	UNO	7.9	0
6	MSH	7.85	357
7	AID/Rep	7.94	0
8	HRD	TBD	TBD

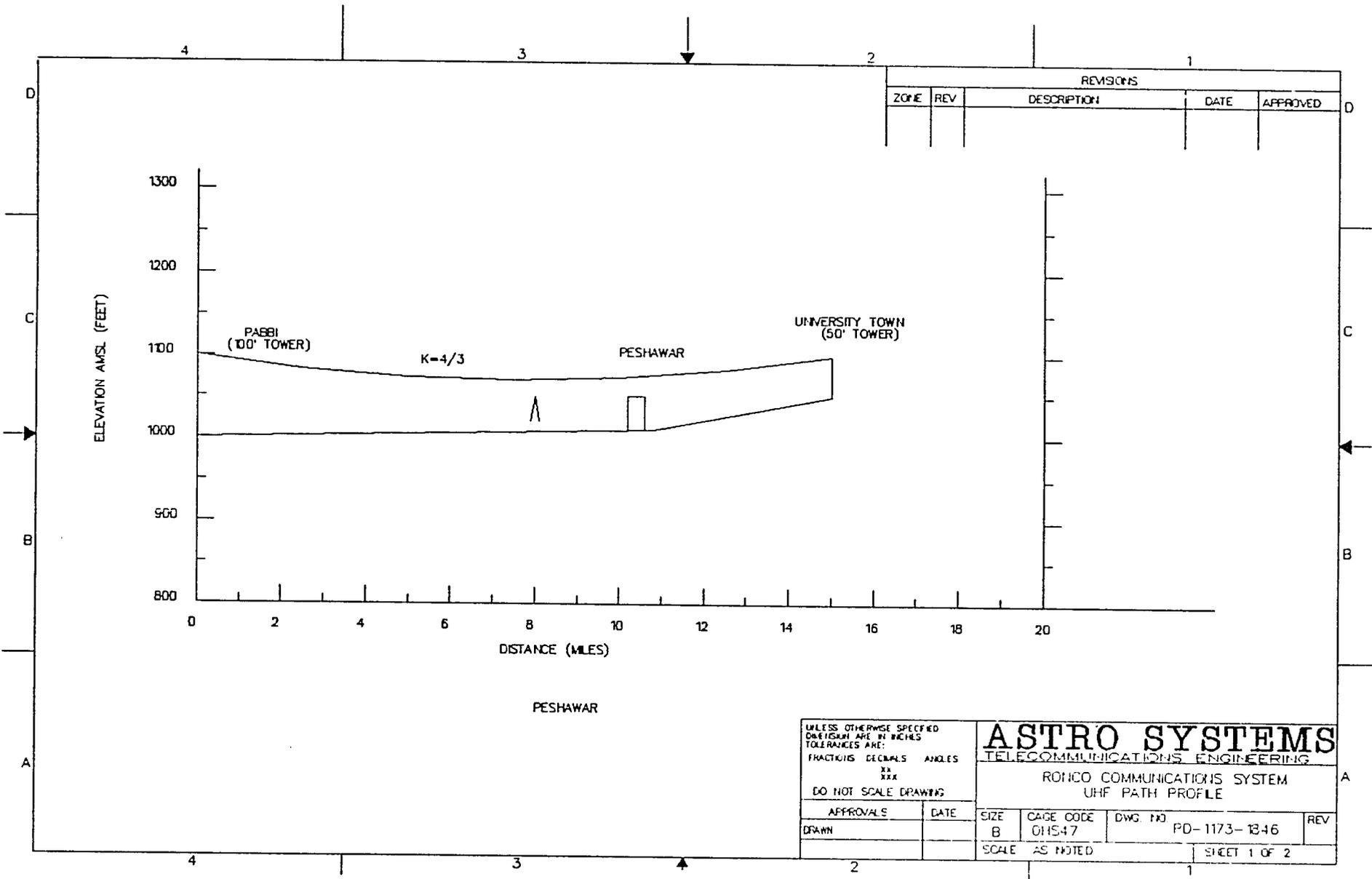
**TABLE 3**  
**HF TELECOMMUNICATIONS SYSTEMS**  
**Peshawar/Quetta, Pakistan**  
**Post Survey Quantities**

Site Location							
Peshawar, Pakistan							
1	Peshawar HF Base Station	1					
		BSAA	Phones	Mobiles	Fixed	Portable	Total
2	RONCO HQ BSAA	1	4	2	0	0	2
3	RONCO MDC BSAA	1	0	10	0	0	10
4	CCSC	1	4	0	0	7	7
5	DAI BSAA	1	4	0	8	0	8
6	VITA BSAA	1	1	1	7	0	8
7	UNO BSAA	1	3	4	4	0	8
8	MSH BSAA	1	1	2	4	0	6
9	IRC BSAA	1	3	3	1	1	5
10	IMC BSAA	1	2	3	0	0	3
11	CARE BSAA	1	4	0	2	0	2
12	AID-AREP/OE BSAA *	1	3	3	1	0	4
13	AID-AREP/TSSP BSAA *	1	0	6	0	0	6
14	Spares	0	0	3	0	0	3
15	HRD	1	4	2	4	0	6
<b>Peshawar Total</b>		<b>12</b>	<b>29</b>	<b>37</b>	<b>27</b>	<b>8</b>	<b>72</b>
Quetta, Pakistan							
1	Quetta HF Base Station	1					
		BSAA	Phones	Mobiles	Fixed	Portable	Total
2	RONCO HQ BSAA	1	2	3	0	0	3
3	DAI BSAA	1	2	0	2	0	2
4	VITA BSAA #	1	1	0	2	0	2
5	UNO BSAA	1	1	2	0	0	2
6	MSH BSAA	1	2	2	0	0	2
7	AID-AREP/TSSP BSAA *	1	1	1	1	0	2
	HRD BSAA	1	4	2	0	0	2
<b>Quetta Total</b>		<b>6</b>	<b>9</b>	<b>8</b>	<b>5</b>	<b>0</b>	<b>13</b>
<b>GRAND TOTAL</b>		<b>18</b>	<b>38</b>	<b>45</b>	<b>32</b>	<b>8</b>	<b>85</b>

\* The BSAA and Mobile radio quantities listed in the shaded areas will be purchased by AID directly from ASTRO.

HRD quantities are not included in totals for Peshawar and Quetta.

# Co-located in AID office building.



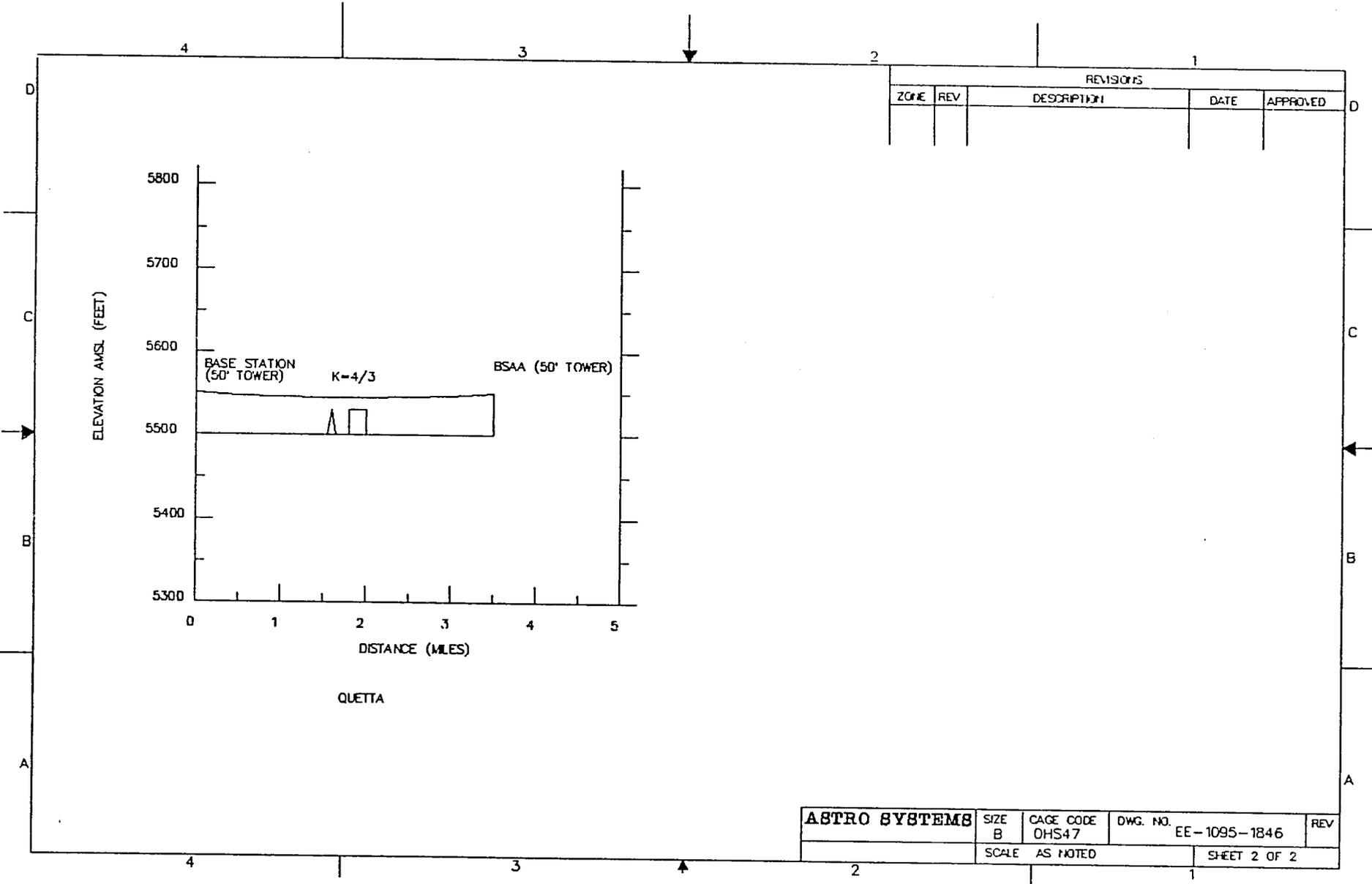
REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED

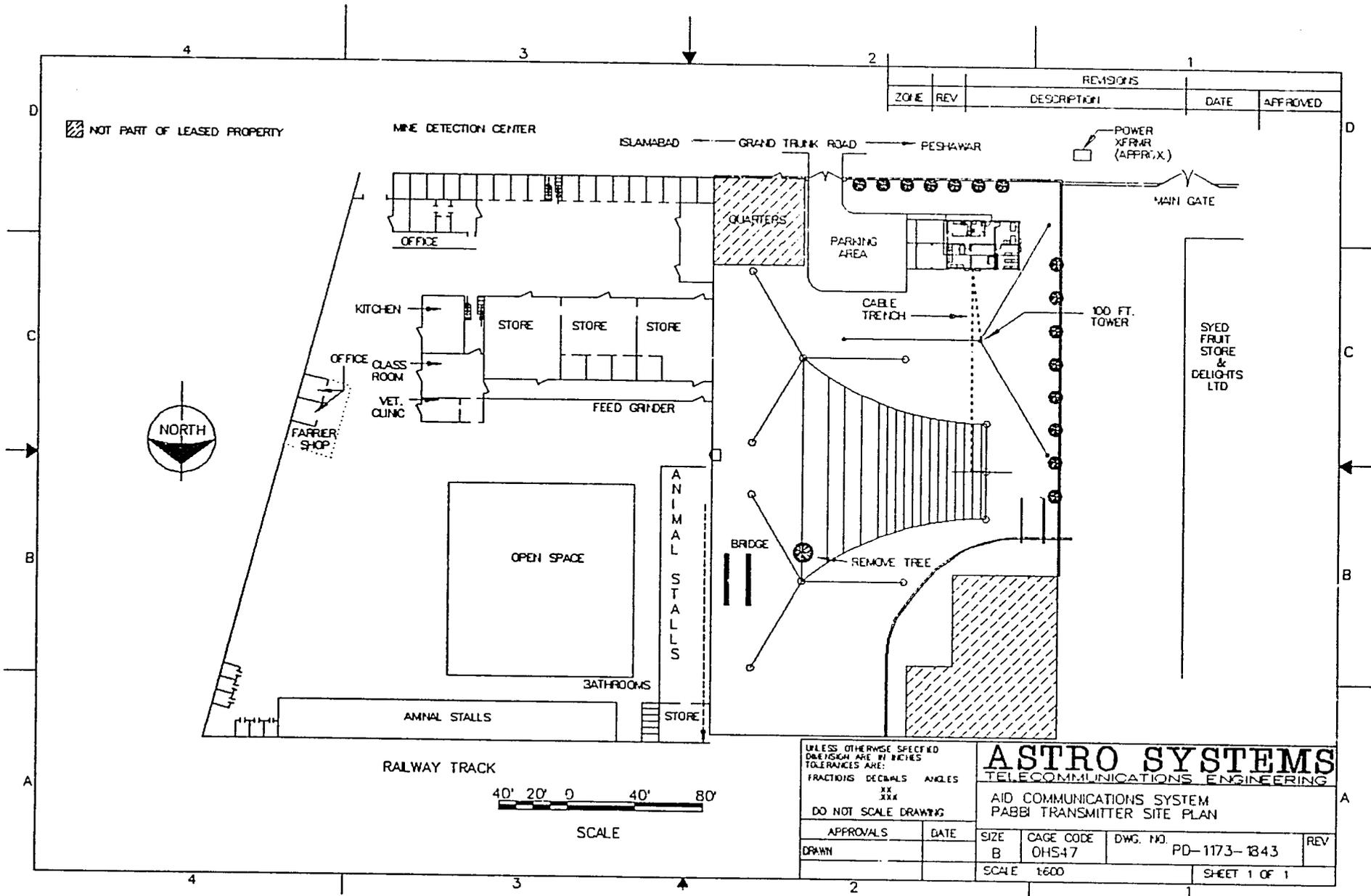
UNLESS OTHERWISE SPECIFIED  
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 TOLERANCES ARE:  
 FRACTIONS DECIMALS ANGLES  
 XX  
 XXX  
 DO NOT SCALE DRAWING

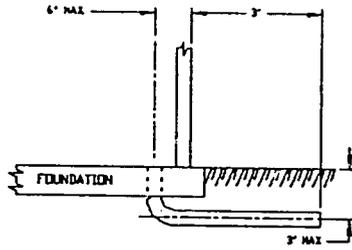
**ASTRO SYSTEMS**  
 TELECOMMUNICATIONS ENGINEERING

ROHICO COMMUNICATIONS SYSTEM  
 UHF PATH PROFILE

APPROVALS	DATE	SIZE	CAGE CODE	DWG NO	REV
DRAWN		B	DHS47	PD-1173-1846	
SCALE AS NOTED				SHEET 1 OF 2	

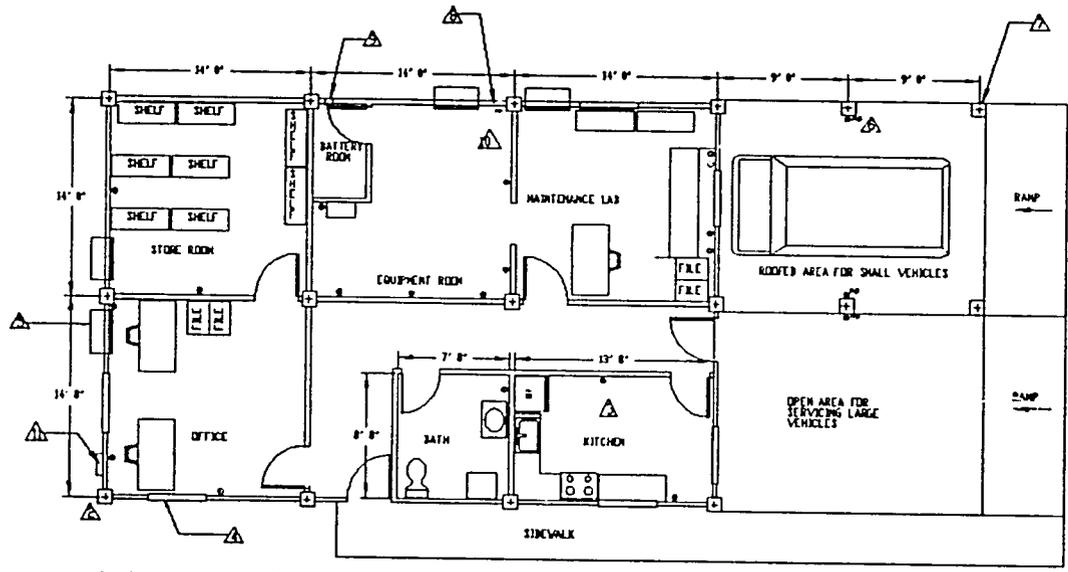






DETAIL A

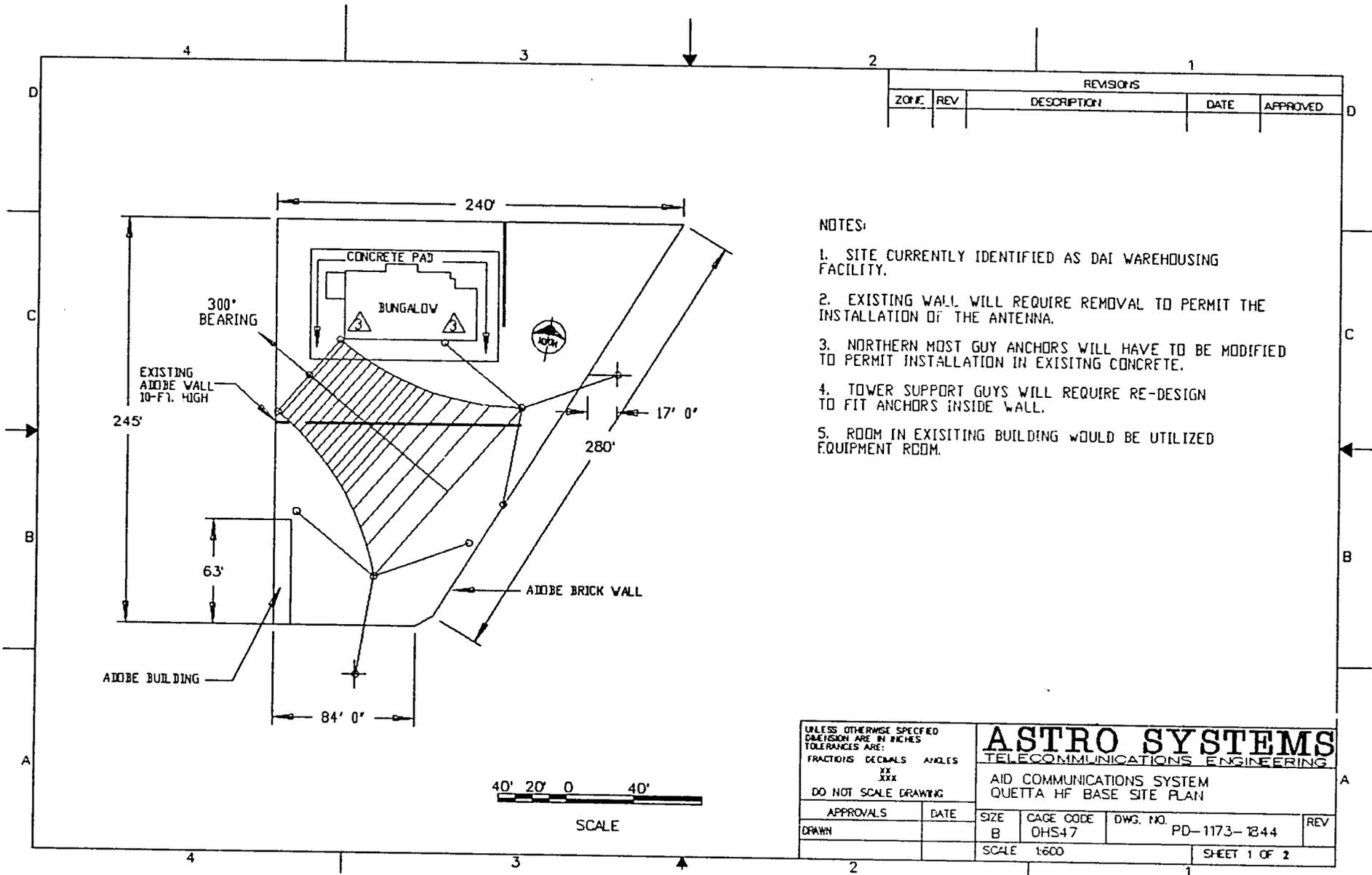
DATE	BY	DESCRIPTION	SCALE	APP'D



NOTES

1. THIS DRAWING INDICATES THE BASIC SIZE AND ROOM REQUIREMENTS FOR THE PABBI TRANSMITTER BUILDING. FINAL DESIGN TO BE COMPLETED BY A LOCAL ARCHITECT.
2. CORNER OF BUILDING TO BE LOCATED 24' FEET FROM THE WEST WALL AND 24' FROM THE SOUTH WALL OF THE SITE.
3. APPLIANCES AND ELECTRICAL FITTINGS TO BE LOCALLY SUPPLIED.
4. ACTUAL SIZE OF WINDOW FRAMES TO BE DETERMINED BY THE ARCHITECT.
5. AIR CONDITIONING UNITS MINIMUM SIZE: 24,000 BTU.
6. OUTDOOR OUTLETS TO BE WATERPROOF.
7. OUTDOOR VEHICLE MAINTENANCE AREA TO BE PROVIDED WITH ROOF AREA ONLY. NO SIDE WALL STRUCTURE ARE REQUIRED. RAMP GRADE TO BE DETERMINED BY LOCAL ARCHITECT.
8. TWO 2-INCH PVC CONDUITS SHALL BE PLACED IN THE FLOOR OF THE EQUIP. ROOM. SEE DETAIL A FOR EXACT PLACEMENT. CONDUIT TO BE BURIED AT 3'-FT. BELOW GRADE. PULL STRING TO BE LEFT IN CONDUIT. AREA OUTSIDE BUILDING TO BE RAMMED EXCAVATED. DO NOT BACKFILL.
9. MINIMUM 6-INCH PVC EXHAUST FAN TO BE PROVIDED 7'-FT. ABOVE FINISHED FLOOR TO VENT BATTERY GASES FROM ROOM. FAN TO BE OPERATED CONSTANTLY.
10. 30 AMPERE, SINGLE PHASE RECEPTACLE AND PLUG TO BE LOCATED 12-INCHES ABOVE FLOOR.
11. PROPOSED LOCATION FOR 3-PHASE POWER PANEL. TRANSFORMER LOCATED APPROX. 200'-FT. FROM SOUTHWEST CORNER OF BUILDING.

PROPERTY	NO.	DESCRIPTION	DATE	BY
ASTRO SYSTEMS				
<b>ASTRO SYSTEMS</b>				
AID COMMUNICATIONS SYSTEM				
PABBI HF TRANSMITTER BLDG.				
PROJECT NO.	DATE	SCALE	DATE	BY
D 04547			PO-1173-1847	



REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED

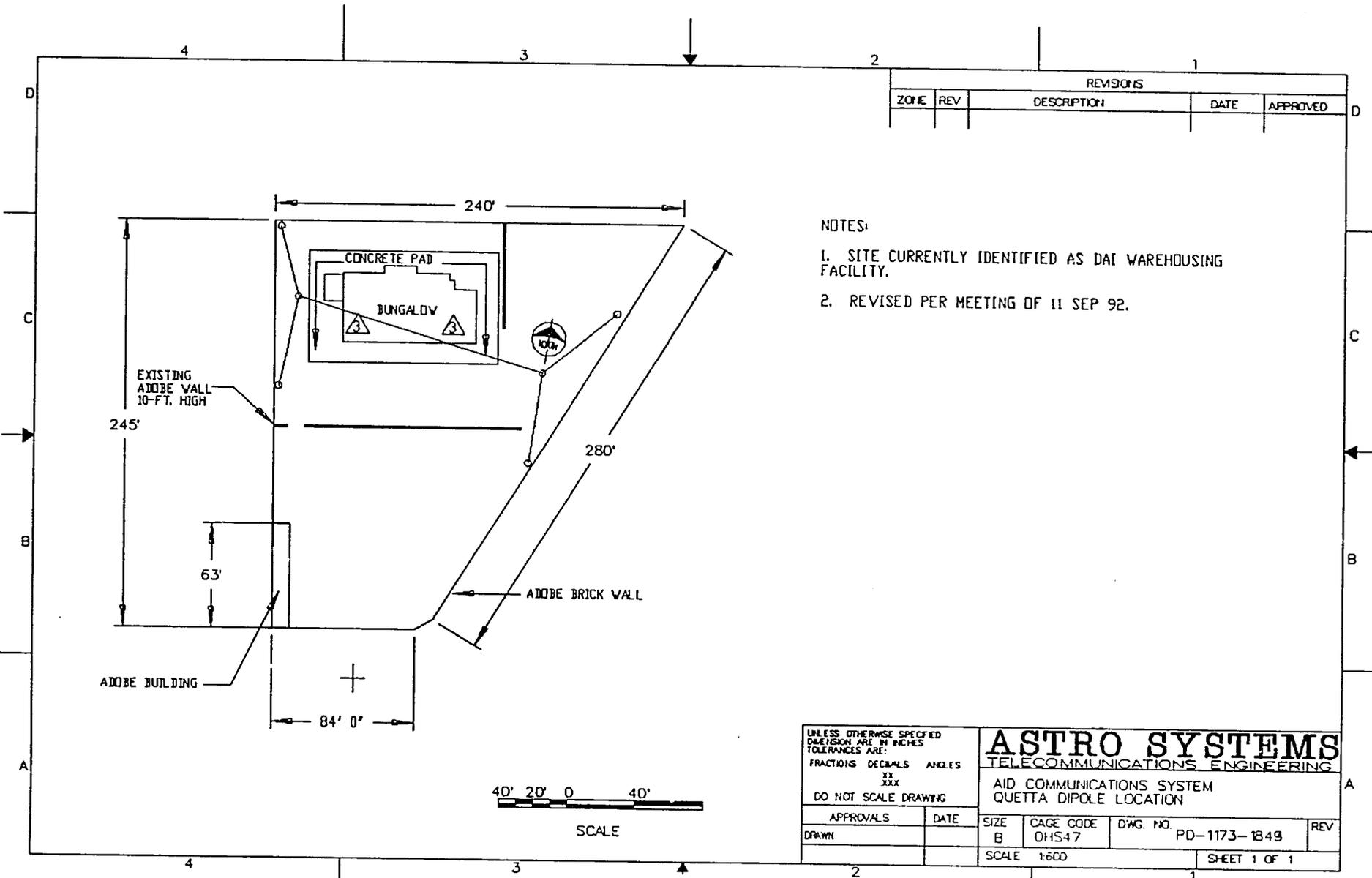
- NOTES:
1. SITE CURRENTLY IDENTIFIED AS DAI WAREHOUSING FACILITY.
  2. EXISTING WALL WILL REQUIRE REMOVAL TO PERMIT THE INSTALLATION OF THE ANTENNA.
  3. NORTHERN MOST GUY ANCHORS WILL HAVE TO BE MODIFIED TO PERMIT INSTALLATION IN EXISTING CONCRETE.
  4. TOWER SUPPORT GUYS WILL REQUIRE RE-DESIGN TO FIT ANCHORS INSIDE WALL.
  5. ROOM IN EXISTING BUILDING WOULD BE UTILIZED EQUIPMENT ROOM.

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
TOLERANCES ARE:  
FRACTIONS DECIMALS ANGLES  
XX  
XXX  
DO NOT SCALE DRAWING

**ASTRO SYSTEMS**  
TELECOMMUNICATIONS ENGINEERING

AID COMMUNICATIONS SYSTEM  
QUETTA HF BASE SITE PLAN

APPROVALS	DATE	SIZE	CAGE CODE	DWG. NO.	REV
		B	OHS47	PD-1173-1344	
SCALE 1:600				SHEET 1 OF 2	



REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPROVED

- NOTES:
1. SITE CURRENTLY IDENTIFIED AS DAI WAREHOUSING FACILITY.
  2. REVISED PER MEETING OF 11 SEP 92.

UNLESS OTHERWISE SPECIFIED  
 DIMENSIONS ARE IN INCHES  
 TOLERANCES ARE:  
 FRACTIONS DECIMALS ANGLES  
 XX  
 XXX  
 DO NOT SCALE DRAWING

**ASTRO SYSTEMS**  
 TELECOMMUNICATIONS ENGINEERING

AID COMMUNICATIONS SYSTEM  
 QUETTA DIPOLE LOCATION

APPROVALS	DATE	SIZE	CAGE CODE	DWG. NO.	REV
DRAWN		B	DHS47	PD-1173-1849	
SCALE 1:600				SHEET 1 OF 1	

## O/AID/Rep HF COMMUNICATIONS SYSTEM

### 1. INTRODUCTION

The O/AID/Rep HF communications system is being implemented to support U.S. AID activities for Afghanistan. The system is designed to permit various organizations in Peshawar and Quetta, Pakistan to communicate with mobile radios located in their associated vehicles.

### 2. SYSTEM CONFIGURATION

#### 2.1 GENERAL

The system will consist of three major components:

- a. Two (2) HF base stations, located in Peshawar and Quetta.
- b. Seventy-three (73) mobile HF radio vehicular installations. Each end user has a specified number of vehicles.
- c. Fifteen (15) Base Station Access Arrangements (BSAA). Ten (10) BSAA's are located in Peshawar and five (5) in Quetta.

The system will provide HF SSB voice communications over long distances between the mobile stations and the two HF base stations.

Each base station will be interconnected by a repeater controller to several Base Station Access Arrangements (BSAA) by means of UHF point-to-point transceivers. At both Peshawar and Quetta, the installed system will represent a "star" configuration. Figure 1, Peshawar Simplified System Diagram, and Figure 2, Quetta Simplified System Diagram, provide a graphic representation of the overall system configuration. At each BSAA, half-duplex voice service to the mobiles will be possible from one to four desk type telephone instruments. Conversely, half-duplex voice service from the mobiles will be possible to any of the BSAA desk type telephone instruments. A selective calling system will provide selective calling from any mobile HF transceivers or BSAA transceivers to any other mobile HF transceiver. The features of selective calling are

similar to several regular telephone service features. This will reduce confusion and congestion on this large network.

## 2.2. HF BASE STATIONS

There will be two HF base stations. Each base station will include an HF SSB transceivers operating over 2-30 MHz range with a 1 kW average and PEP rating, a UHF transceiver, high gain HF and UHF antennas and supporting towers and a microprocessor based system controller to interconnect the UHF and HF equipment. All equipment, except for the 1 kW linear amplifier, will operate on 12 VDC. A battery and battery charger will be provided to operate this service from 230 VAC 50 Hz. The 1 kW linear amplifier will operate on 230 VAC 50 Hz only.

## 2.3 MOBILE INSTALLATIONS

The mobile stations will be installed in user furnished passenger and rough-terrain vehicles to provide 2-way HF SSB voice service with selective calling. The installation will include the radio transceivers, antenna, antenna tuner, radio mounting shelf and brackets, microphone, speaker (inside radio), cables, connectors and materials and accessories needed to install the equipment. The equipment will operate from the vehicle 12 volt negative ground DC supply.

## 2.4. BASE STATION ACCESS ARRANGEMENT (BSAA)

The BSAA will consist of a UHF/FM transceiver, multiple desk set adapter control interface unit and from one to four desk type telephone instruments. The multiple desk set adapter control interface unit will be capable of interfacing the transceiver to one to four telephone instruments. This includes signalling supervision, keying and send/receive voice levels. The instruments will provide voice communications to the HF SSB mobile radio transceivers. In addition, the telephone sets will be equipped with touch-tone digital signalling pads to control transmission of selective calling codes and changing the base station SSB radio

operating channel (frequency). Various length interconnecting cable will be provided to interconnect the telephones to the control interface unit. The system will operate on 12 VDC. A battery and battery charger will be provided. The battery charger will operate on 220 VAC 50 Hz.

### 3. OPERATION

#### 3.1 GENERAL

By virtue of numerous microprocessors distributed throughout the system, user access will not incur the complexities of multiple-knob twisting of older HF systems. Radios will be quiet or "squelled" until they detect a call with the proper address signals. Selective signalling will be similar to dialling a number in a standard telephone network. The uniqueness of the system will be that operators, in addition to selecting the desired party number (like telephone service) will have a choice of HF frequency and service will be half-duplex, I.e. only one end can talk at a time.

Frequency selection will not require users to tune the radio to a particular frequency such as, 17.185 MHz. To facilitate operation all HF radios will be pre-programmed with all of the authorized operating frequencies and then will be designated as channels 1, 2...X. so that all the operator has to do is set the channel. The HF radio automatically tunes to the selected frequency (channel).

To accommodate the possibility that the HF transmitters may be on one of several frequencies, the HF receivers will automatically scan the pre-programmed frequencies and stop when a call is received on any of the assigned frequencies.

The procedure for selecting channels will be developed depending on what frequencies are assigned to the system.

### 3.2 Mobile Operation

For a mobile operator to call another station in the system, the operator performs the following steps:

- a. set radio transmit channel number.
- b. set the called station number.
- c. press the listen button - this turns on the receiver speaker so that the operator can listen to hear if the channel is not in use.
- d. press the call button.
- e. if the called station is in service, the caller will hear the called station send an acknowledgement tone (in the same manner as telephone service tones).
- f. lift the microphone and press the push-to-talk switch on the microphone and talk.
- g. release the PTT switch and listened to the called station on the speaker.
- h. call is completed by returning the microphone to the hook.

Reception of a call at an HF mobile station is indicated when the radio issues an audible tone. The radio displays the address of the calling party. The called station responds to a call by lifting the microphone and pressing the Push-To-Talk (PTT) switch in the same manner as making a call. If the operator is away from the radio when a call is received, the radio will continue to display the address of the caller so that the operator will know that the station has been called.

### 3.3 BSAA OPERATION

To call a mobile station from a BSAA , the operator performs the following steps:

- a. Observe the BUSY LED on the telephone
  - illuminated means the system is in use
  - extinguished means the system is idle

- b. Lift the handset and set the radio transmit channel number by depressing the appropriate channel number (1,2,3...X) using the telephone key-pad.
- b. Set the called station number by depressing the telephone key-pad.
- c. The system will automatically call the mobile station.
- d. When the mobile station responds to the call, the BSAA user will hear an acknowledgement tone and the BSAA user can press the telephone handset PTT switch and commence talking.
- c. The BSAA user listens by releasing the handset PTT switch.
- f. The BSAA user terminates the call by replacing the handset on the telephone set.

### 3.3 Operational Training

As the system is installed, personnel will be trained in the proper operation of the system components. In addition, a system directory of end-user numbers will be provided.

### 4. END-USER REQUIREMENTS.

The installation of the HF base stations and the BSAA's are dependent upon a number of criteria.

- All facilities are accessible 7 days per week.
- No clearing, grubbing or grading of the HF antenna sites is required.
- Adequate 230 VAC, 50 Hz power is available at protected receptacles at each end-user's facility.
- Suitable space is available for the installation of the BSAA equipment. A survey of each facility will be performed to determine the final location of the UHF transceiver/adaptor, batteries, battery charger, and the four telephone instruments.
- Identification of all vehicles at Peshawar and Quetta for mobile radio installations.

Provide coordination with building owners to permit installation of towers and electronic equipment.

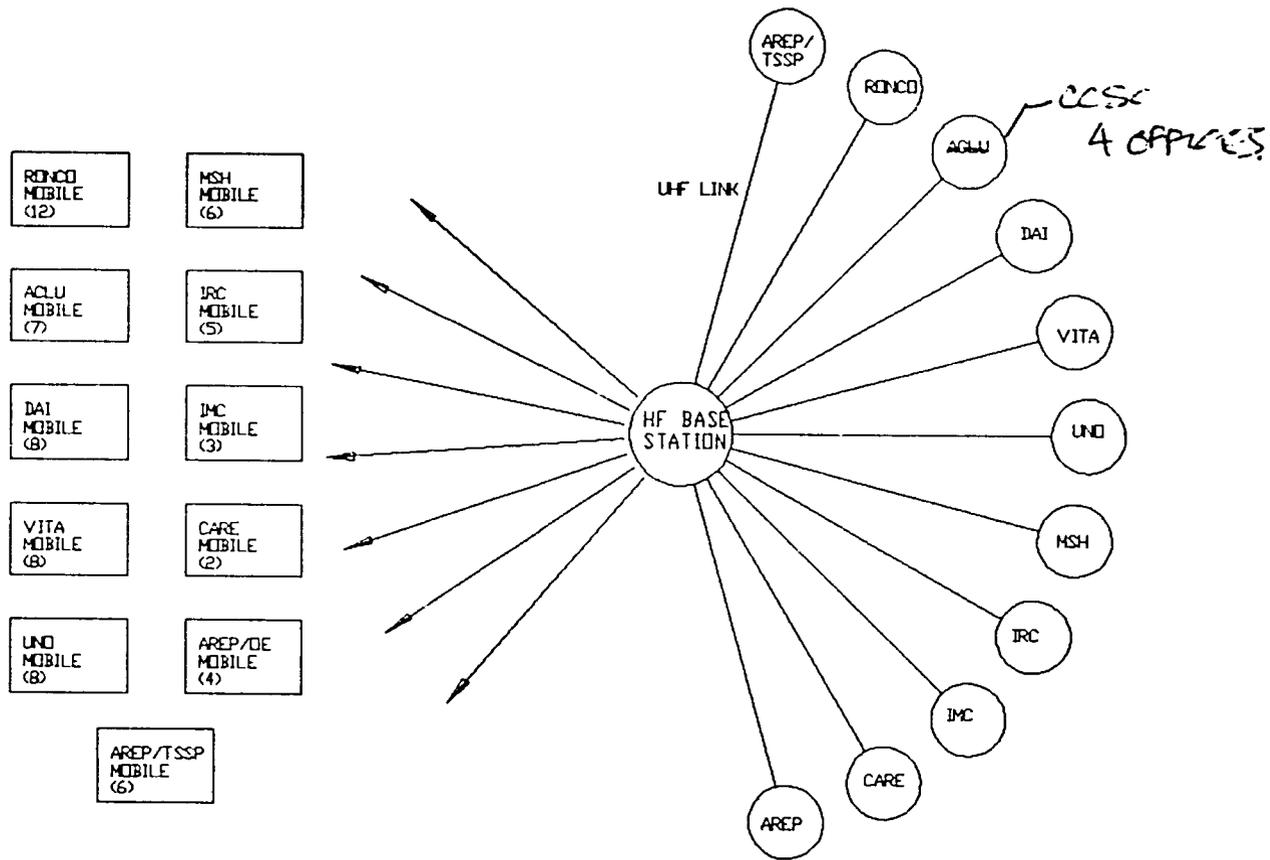


FIGURE 1. PESHAWAR SYSTEM SIMPLIFIED DIAGRAM

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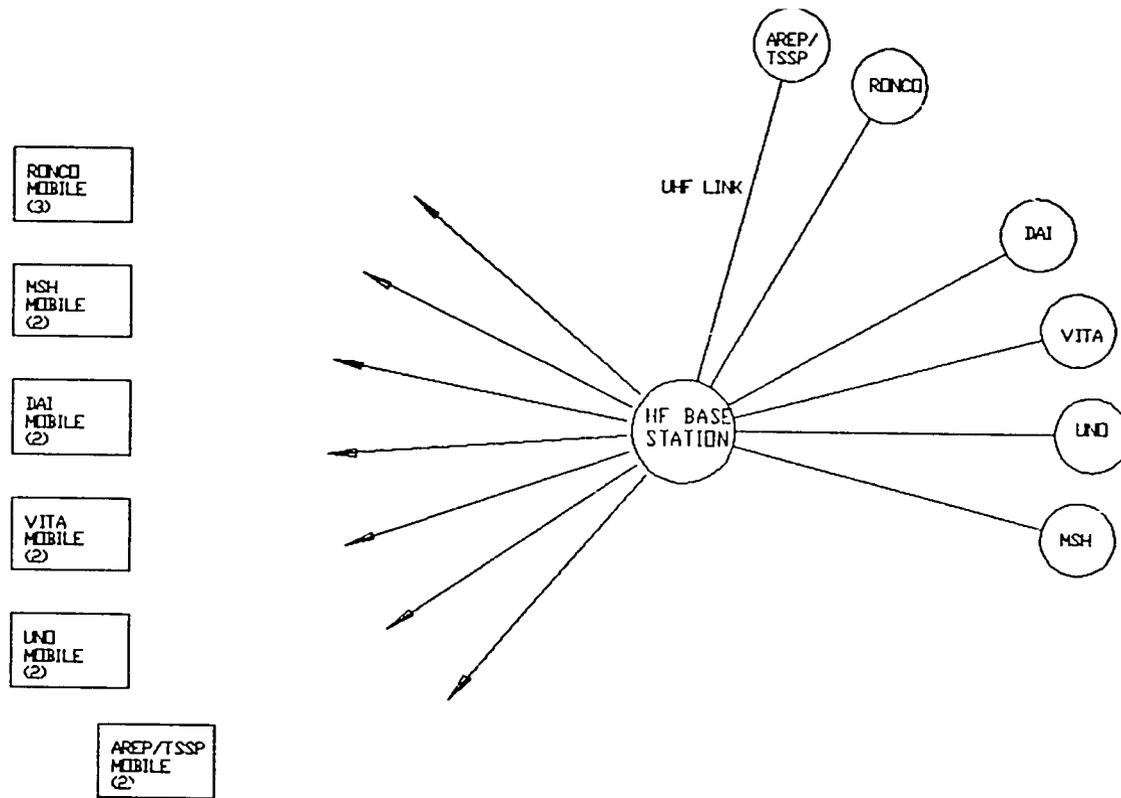


FIGURE 2. QUETTA SYSTEM SIMPLIFIED DIAGRAM

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**SURVEY REPORT  
HF TELECOMMUNICATIONS SYSTEM**

**APPENDIX A**

**Peshawar, Pakistan Photographs**

## APPENDIX A PHOTOGRAPH INDEX

- P1 Peshawar HF Base Station
- P2 RONCO ALO
- P3 RONCO MDC
- P4 CCSC
- P5 DAI
- P6 VITA
- P7 Not Used
- P8 MSH
- P9 IRC
- P10 IMC
- P11 CARE
- P12 O/AID/Rep
- P13 Not Used
- P14 HRD
- P15 RONCO Nasir Pur Vehicle Maintenance Facility
- P16 Hyatabad CCSC/ACLU Vehicle Facility
- P17 AID Pakistan Mobile Radio Installations
- P18 UNHCR Mobile Radio Installations
- P19 RONCO Vehicles
- P20 Miscellaneous

Site Photographs

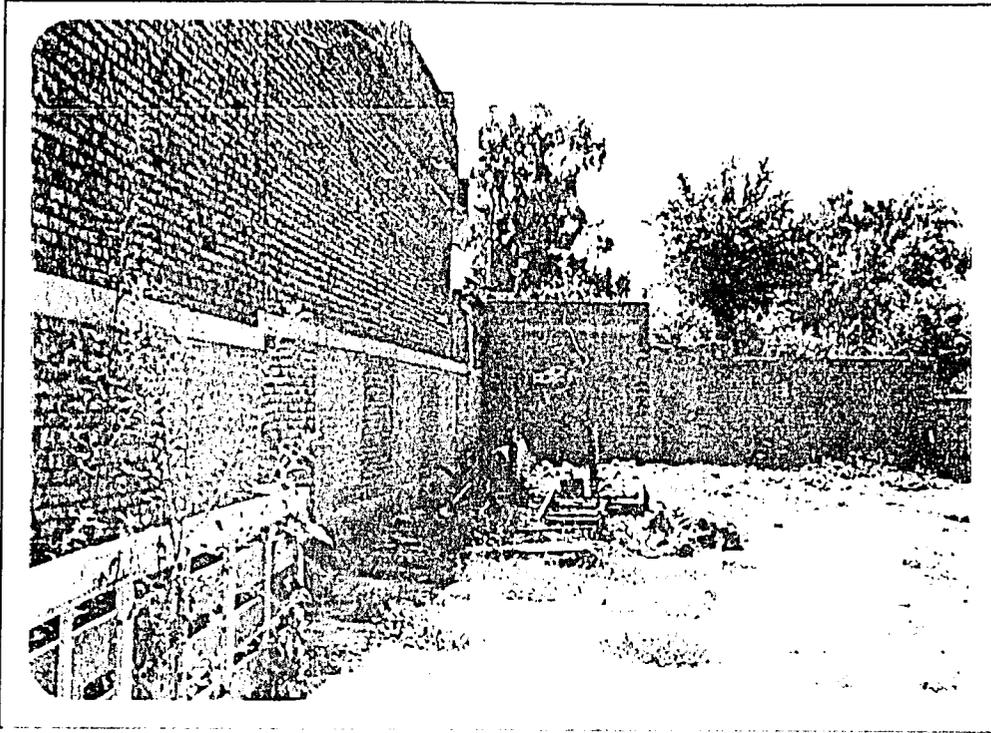


Figure 1 Peshawar HF Base Station Antenna Site. Facing South.

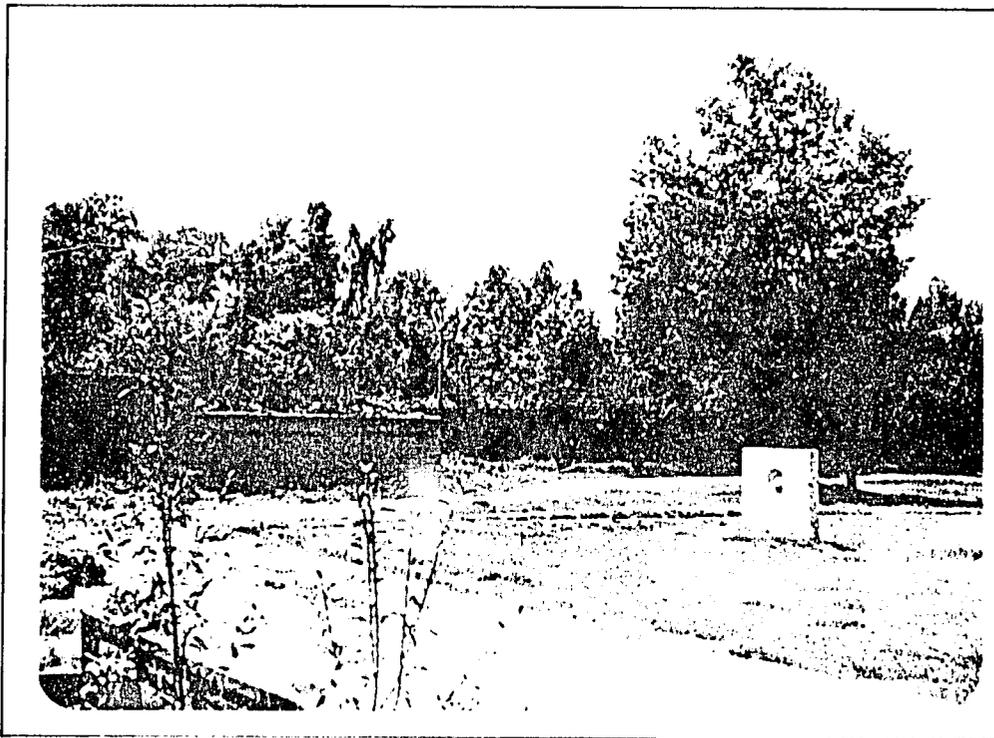


Figure 2 Peshawar HF Base Station Antenna Site. Southwest Wall

Handwritten signature or initials.



Figure 3 Peshawar HF Base Station Antenna Site. Southwest Corner.

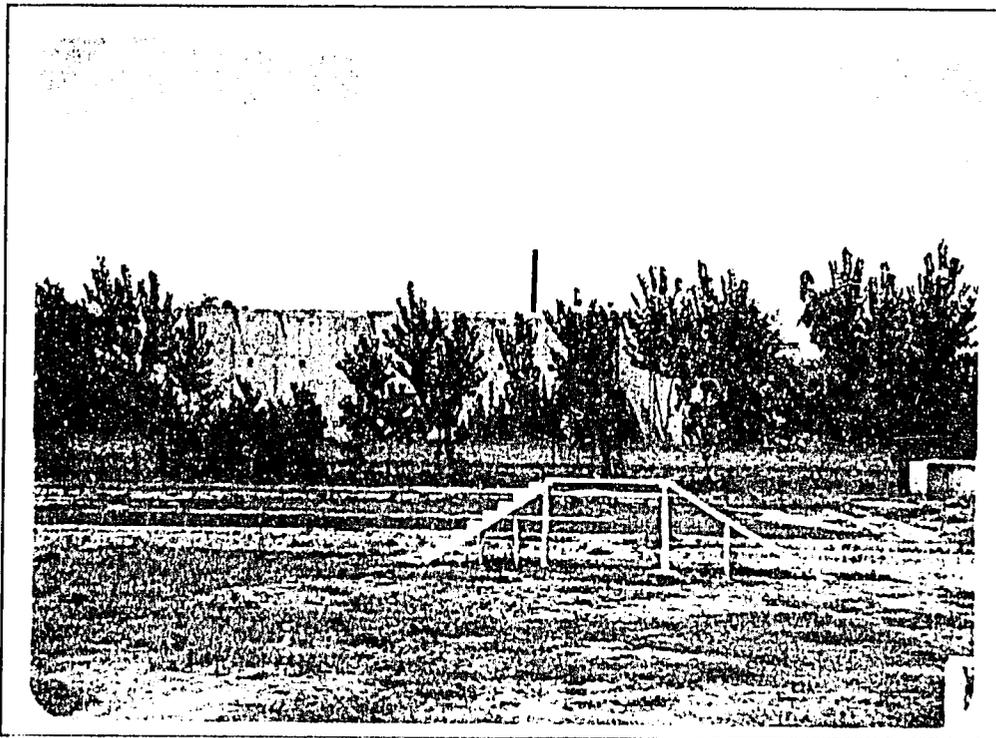


Figure 4 Peshawar HF Base Station Antenna Site. Facing West.

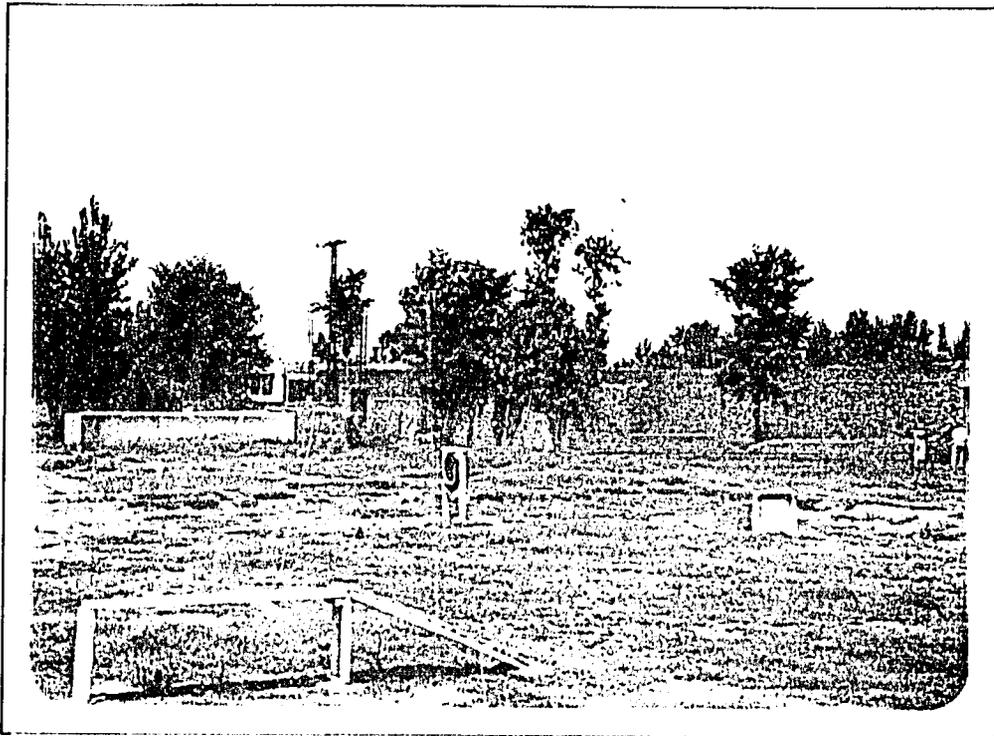


Figure 5 Peshawar HF Base Station Antenna Site. Southwest Corner.

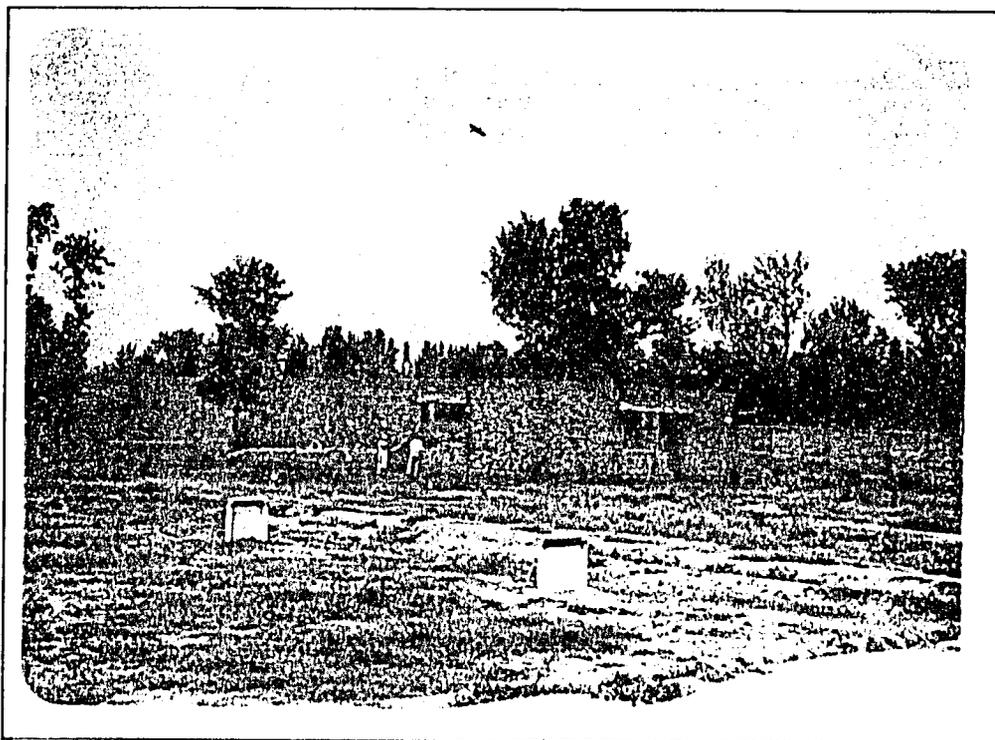


Figure 6 Peshawar HF Base Station Antenna Site. Southwest corner building detail.

174

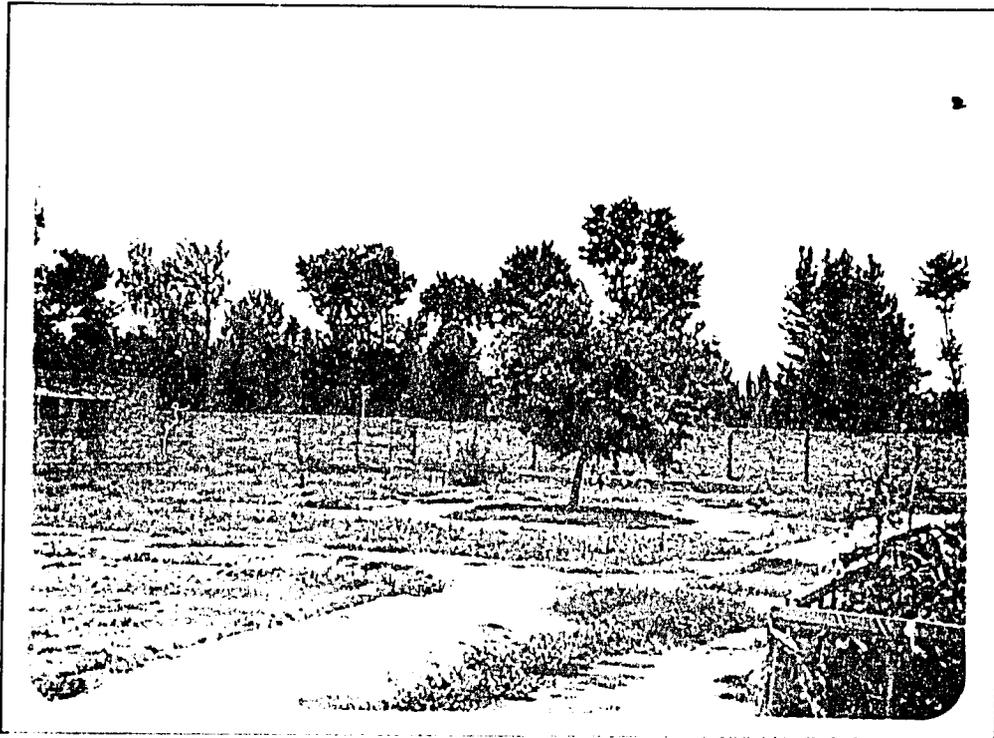


Figure 7 Peshawar HF Base Station Antenna Site. Northwest wall.

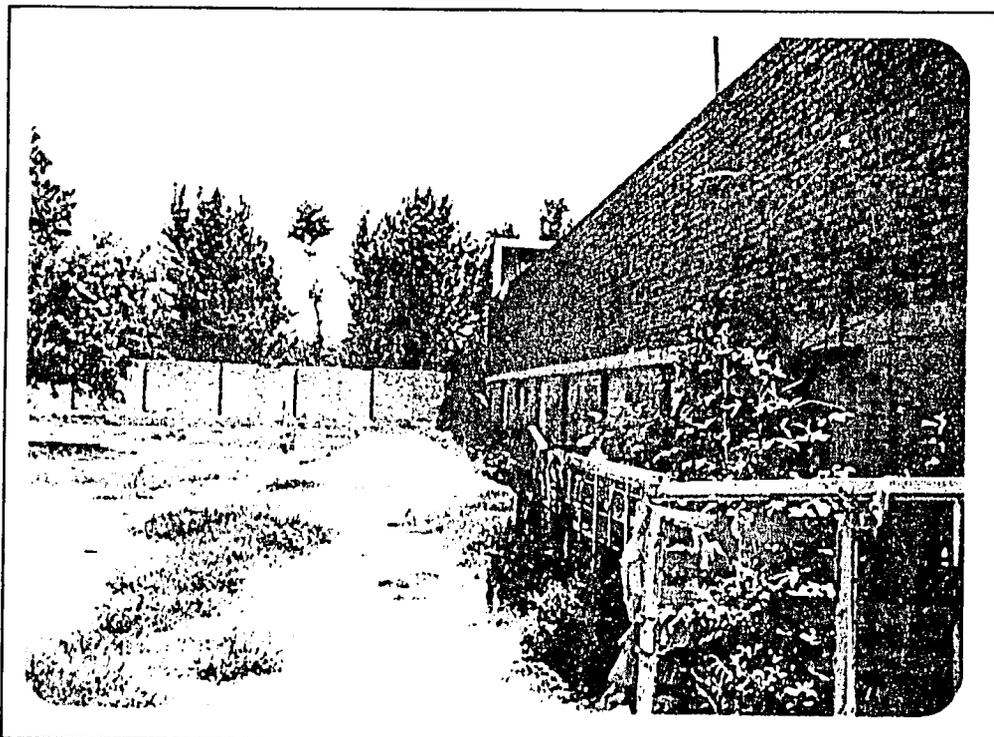


Figure 8 Peshawar HF Base Station Antenna Site. Facing north. Wall divides area from Mine Detection Center.

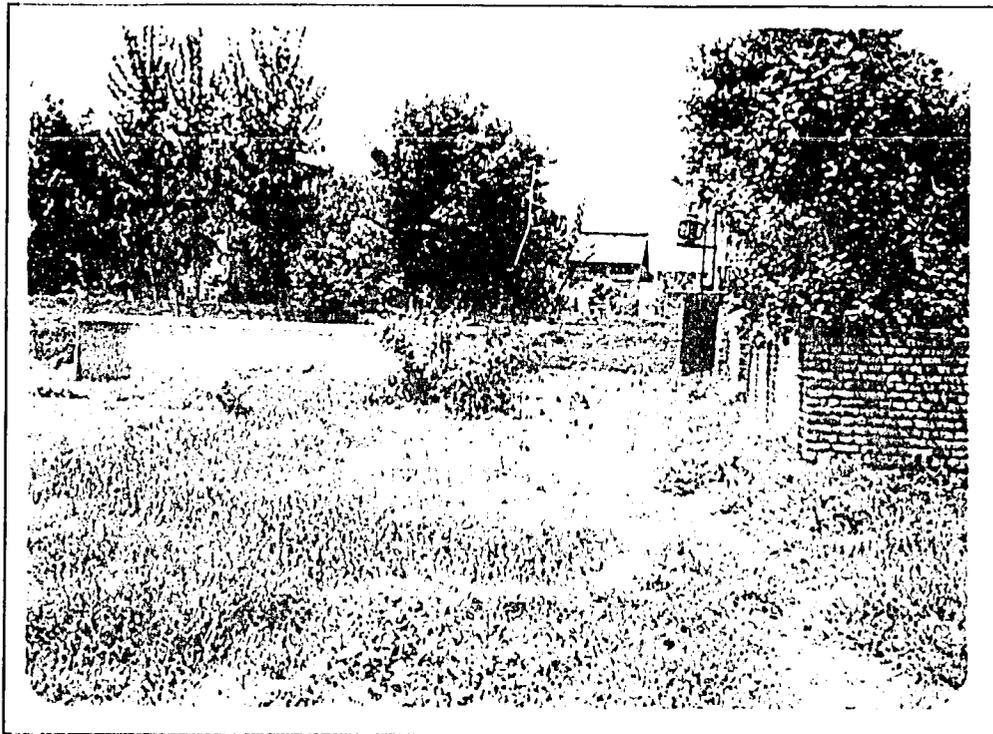


Figure 9 Peshawar HF Base Station Antenna Site. Detail of water obstacle, northwest wall. Drainage ditch course from obstacle toward foreground.

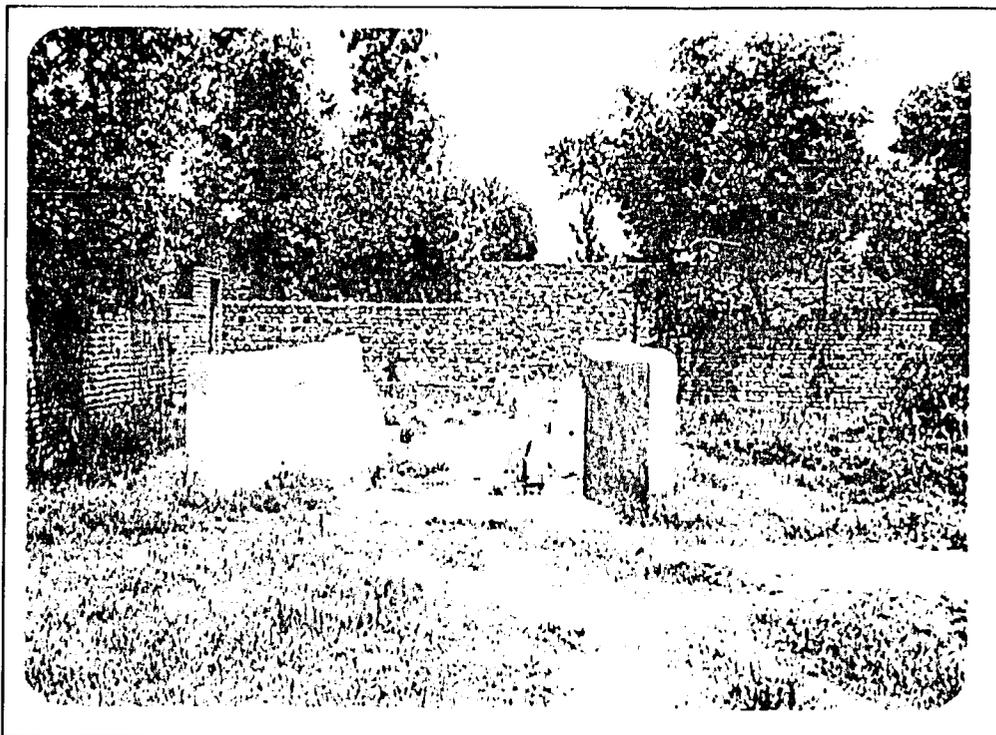


Figure 10 Peshawar HF Base Station Antenna Site. Detail of water obstacle in northwest corner.

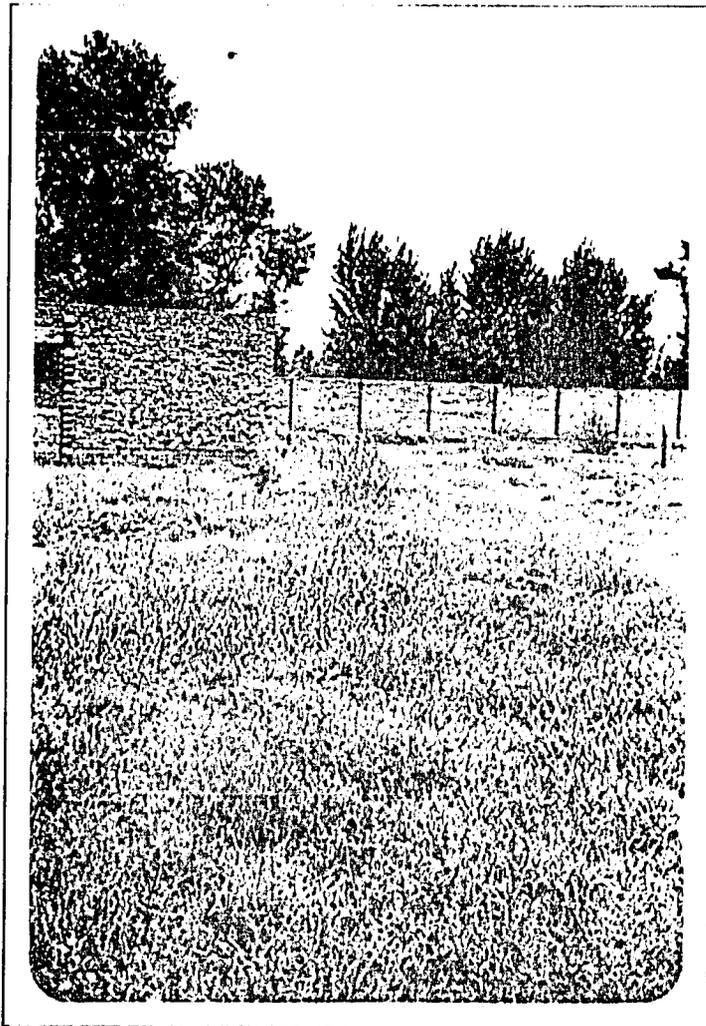


Figure 11 Peshawar HF Base Station Antenna Site. West Wall. Drainage ditch located to immediate right of foreground wall.

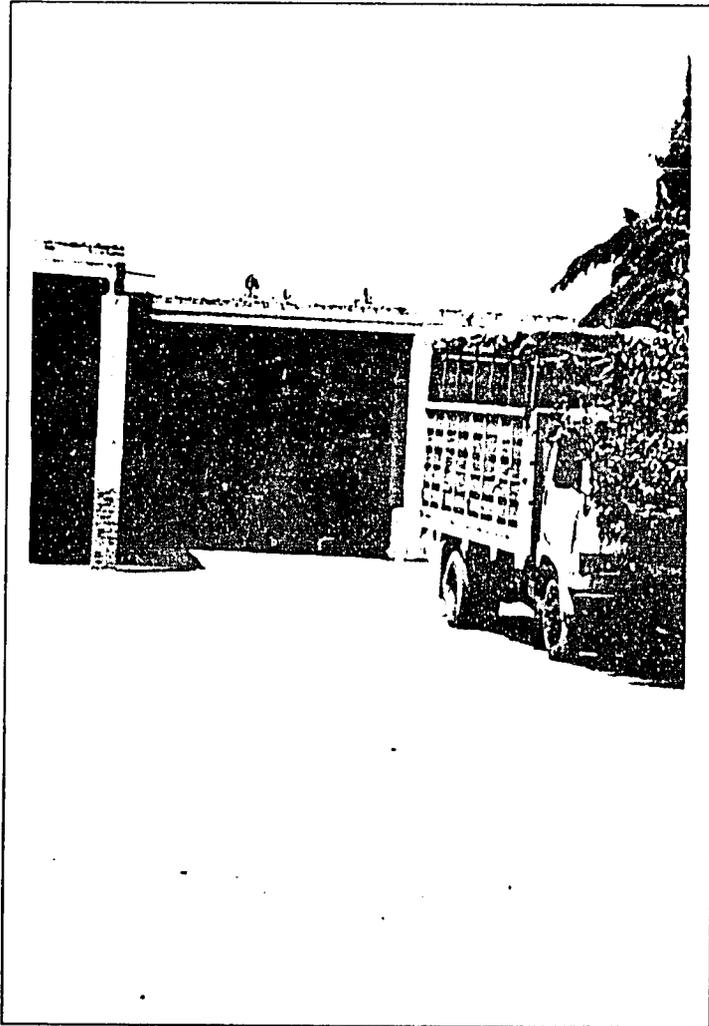


Figure 12 Peshawar HF Base Station Antenna Site.  
Entrance to antenna site from Mine Detection Center  
area.

Site Photographs



Figure 1 Peshawar RONCO ALO Facility. Buildings house part of the support staff.

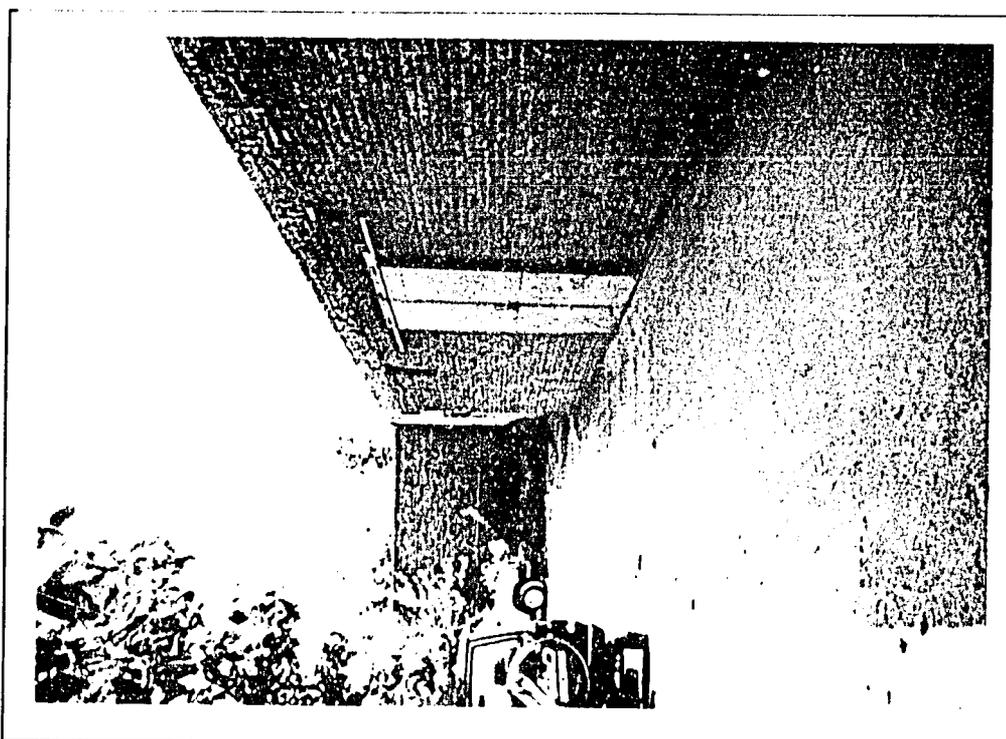


Figure 2 Peshawar RONCO ALO Facility. Warehouse facility near entrance gate.

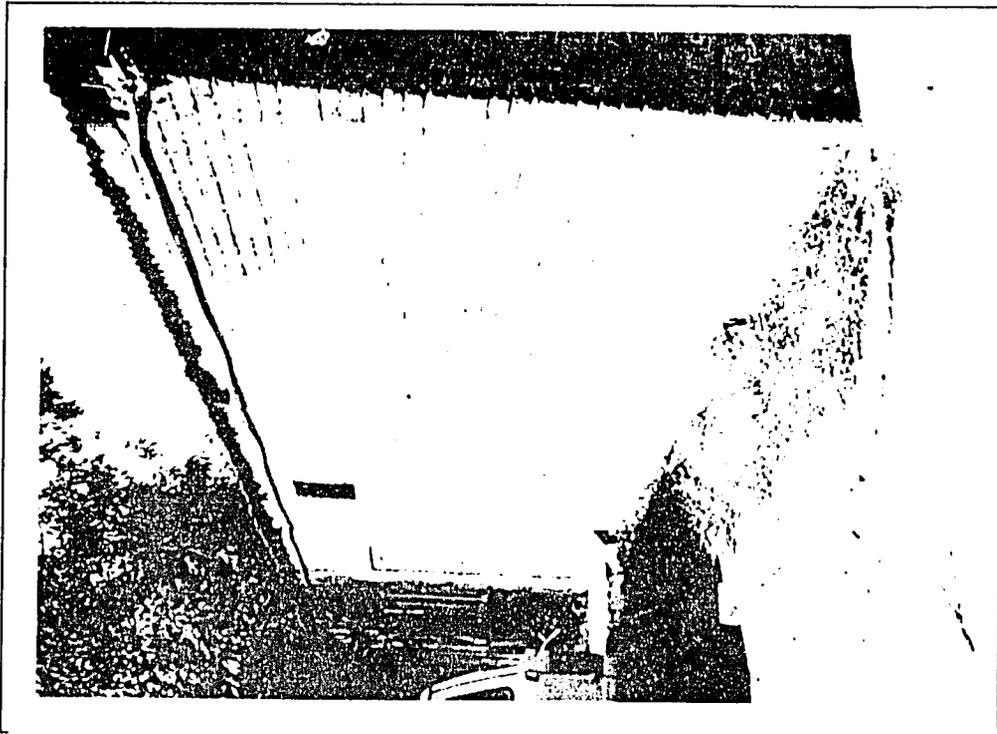


Figure 3 Peshawar RONCO ALO Facility. Proposed location for self-supporting tower or antenna mast.

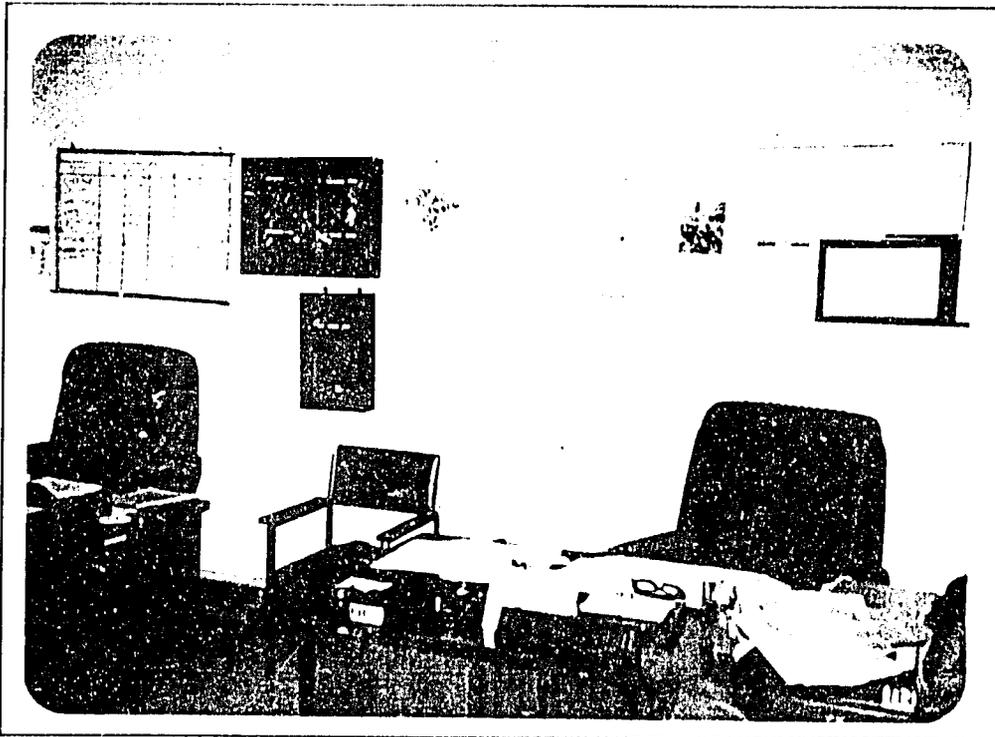


Figure 4 Peshawar RONCO ALO Facility. Administration staff office.

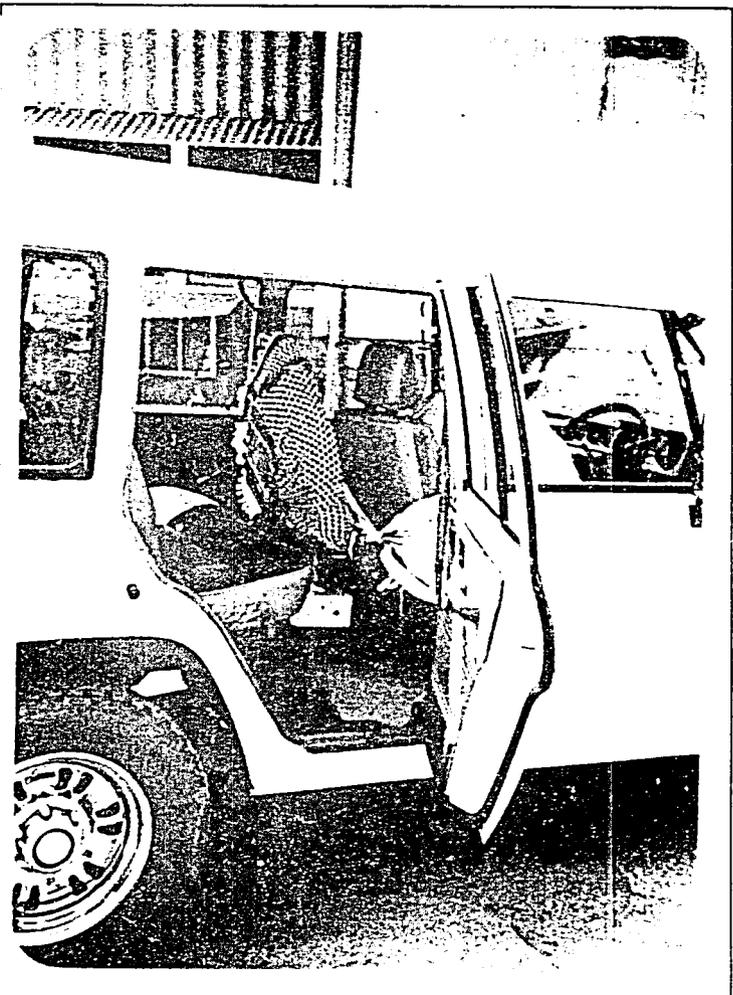


Figure 5 Peshawar RONCO ALO Facility. Mitsubishi Pajero, typical rear seat clearance.

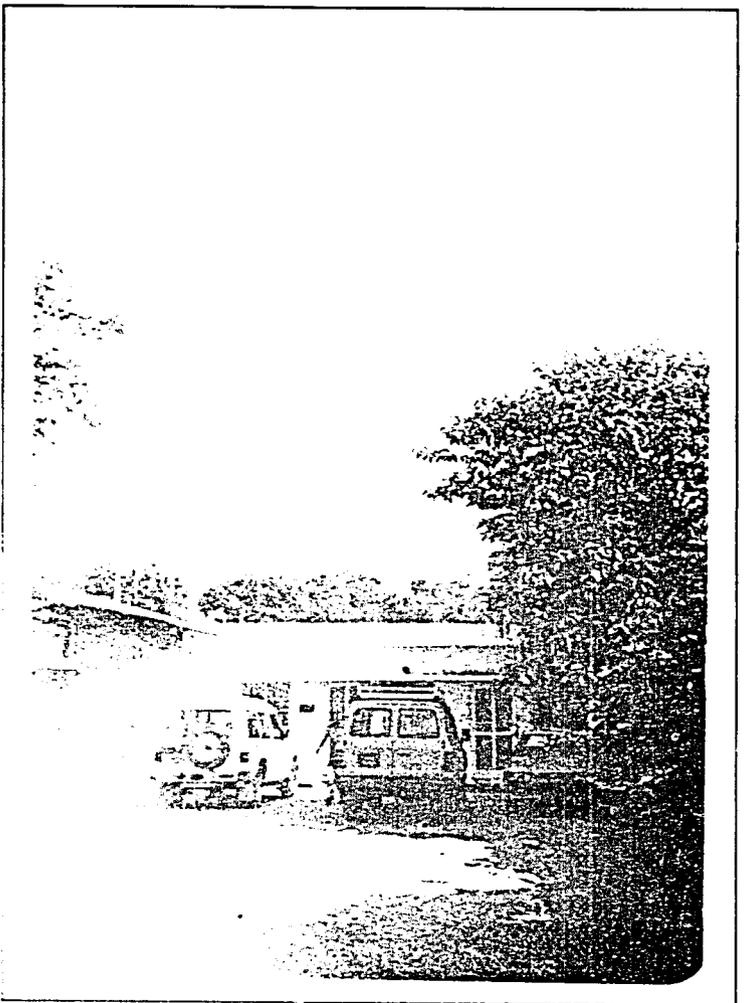


Figure 6 Peshawar RONCO ALO Facility. Main office (background). Antenna mast on left supports AID VHF CommNet antenna.

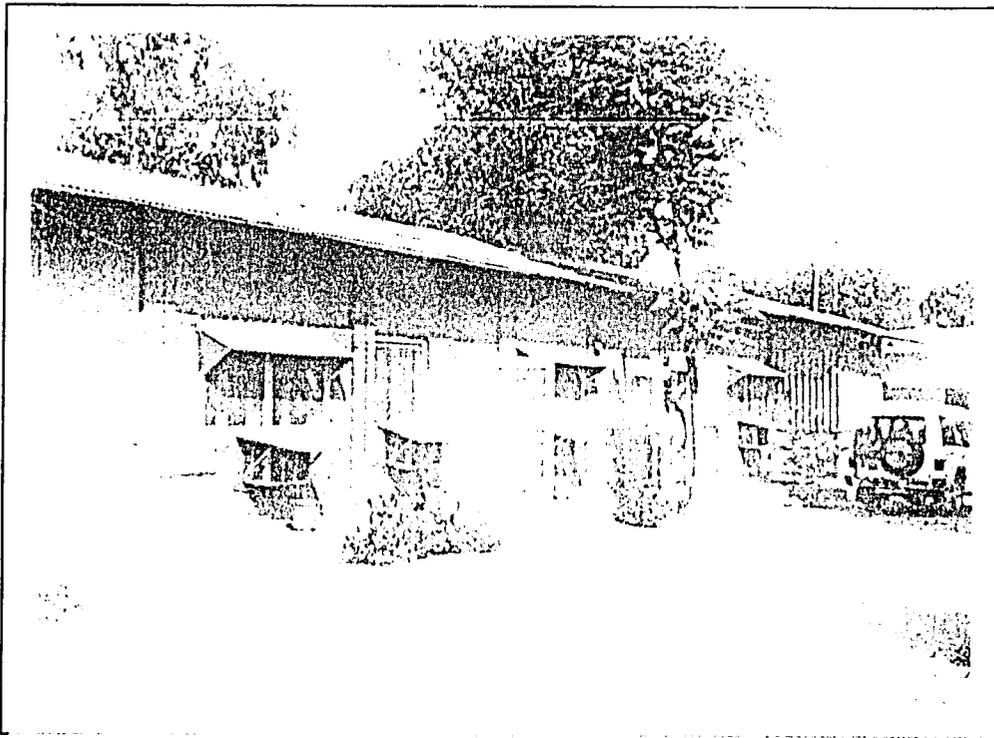


Figure 7 Peshawar RONCO ALO Facility. Adminstrative offices.

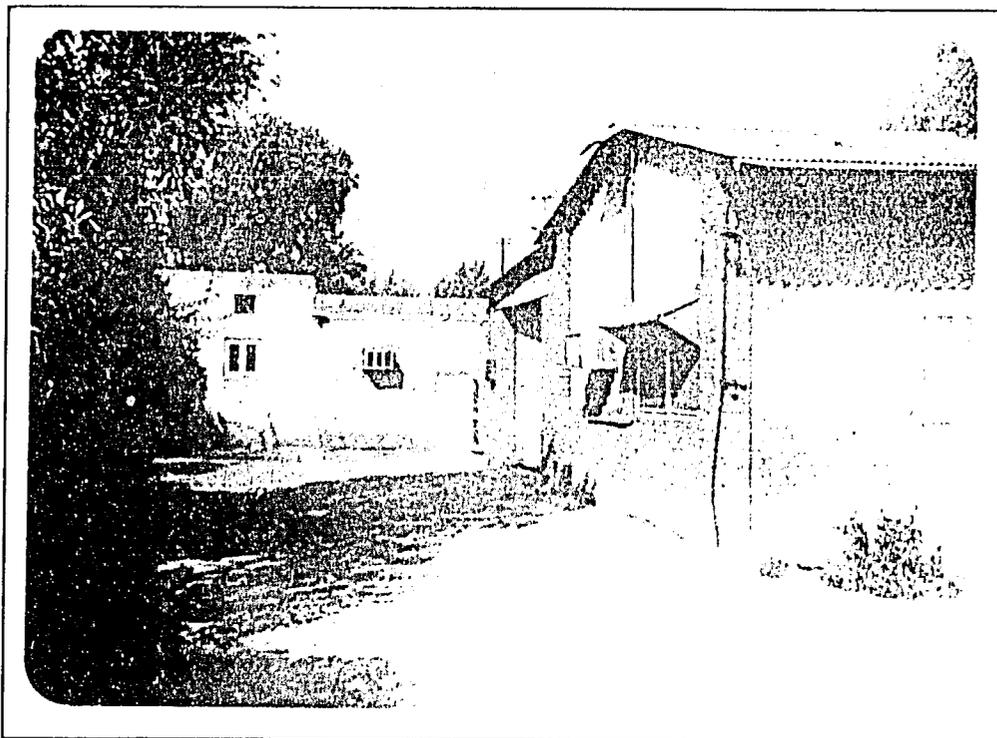


Figure 8 Peshawar RONCO ALO Facility. Part of entrance way. Warehouse or storage area is available in end section of center building.

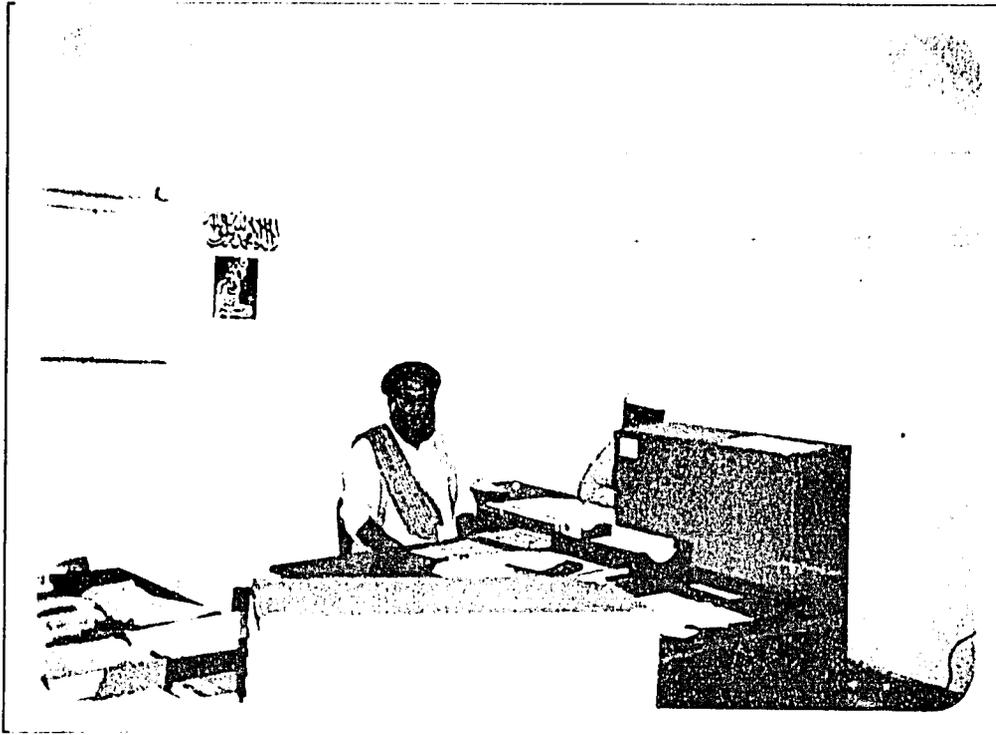


Figure 9 Peshawar RONCO ALO Facility. Proposed location of BSAA equipment (corner).

Site Photographs

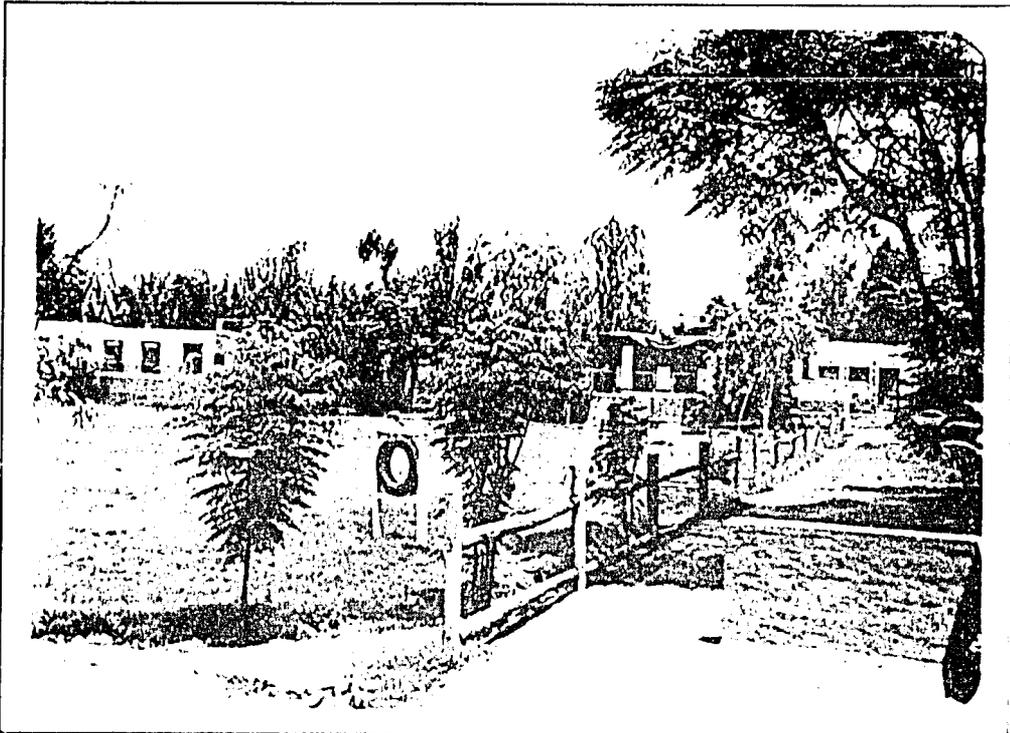


Figure 1 Peshawar (Pabbi) MDC Facility. Dog handler and kennels in background. Training area foreground.

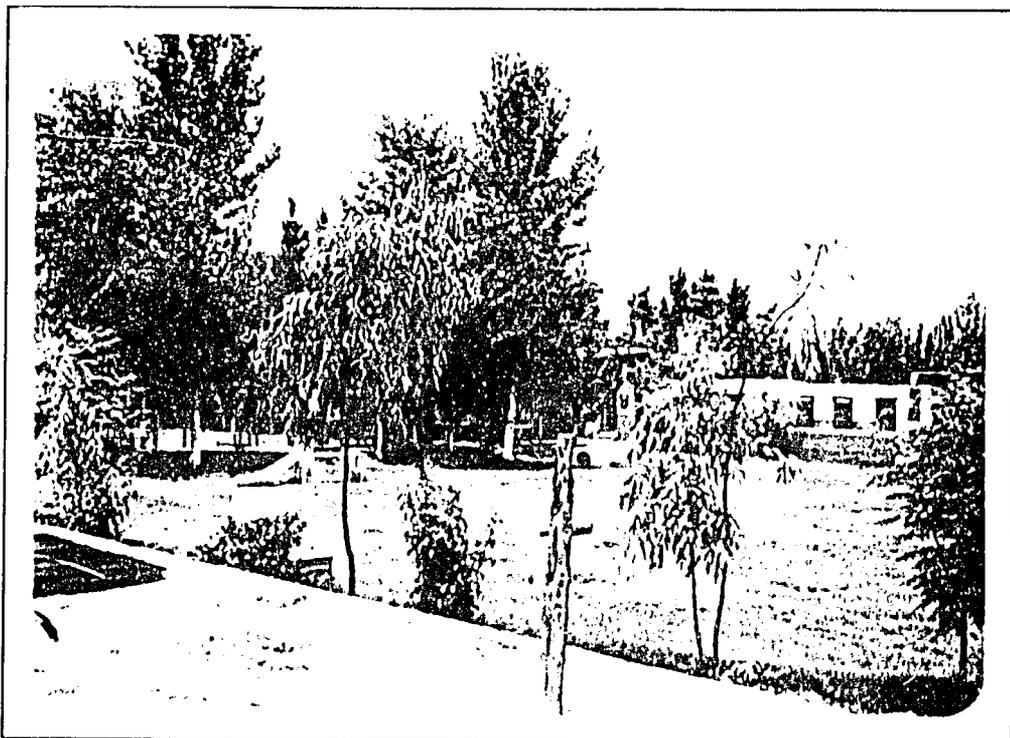


Figure 2 Peshawar (Pabbi) MDC Facility. Dog handler and kennels in background. Training area foreground. Facing Northwest.

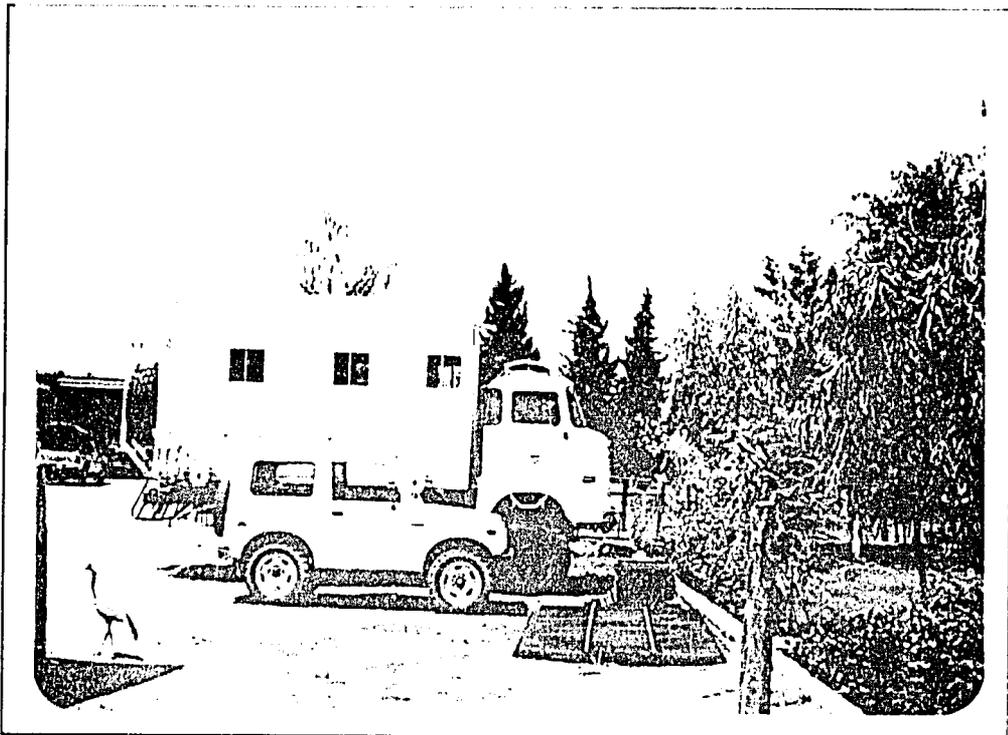


Figure 3 Peshawar (Pabbi) MDC Facility. East German Shower Truck. Vehicle is being modified for use by RONCO MDC.

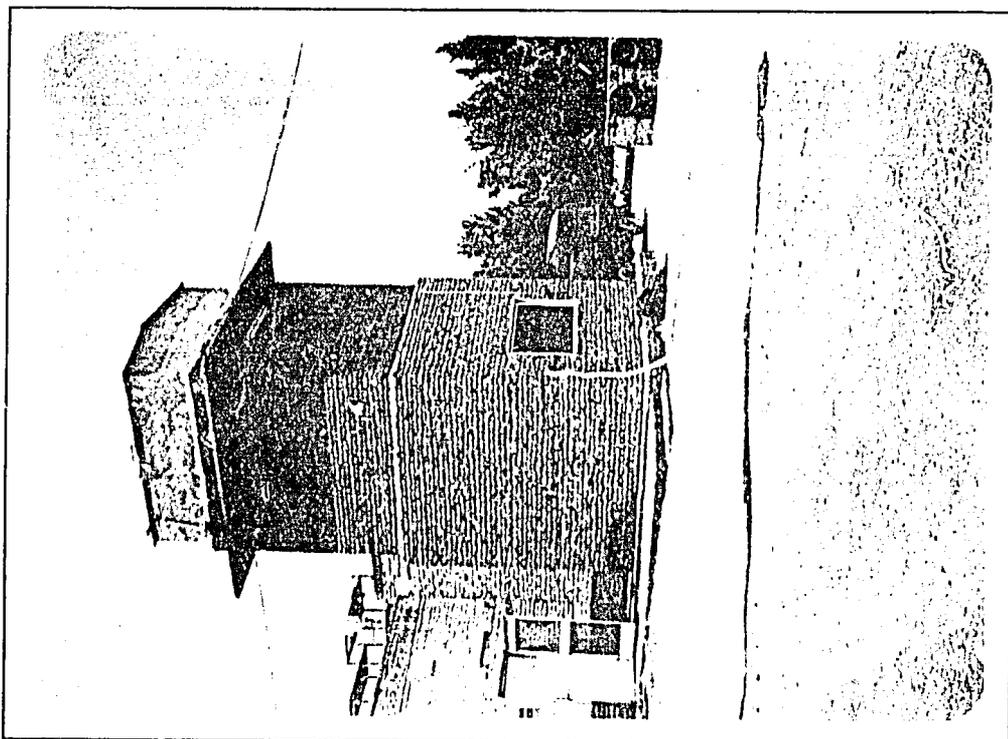


Figure 4 Peshawar (Pabbi) MDC Facility. Water Tower, previously proposed equipment location for HF Base Station.

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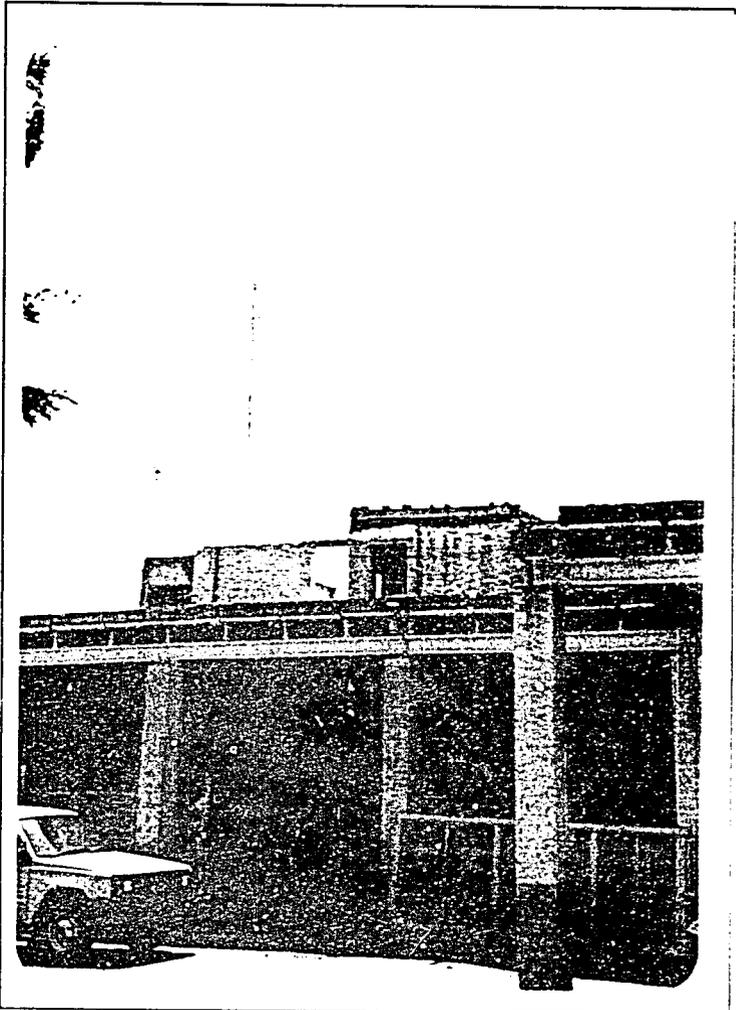


Figure 5 Peshawar (Pabbi) MDC Facility. AID VHF CommNet antenna installation.

Site Photographs

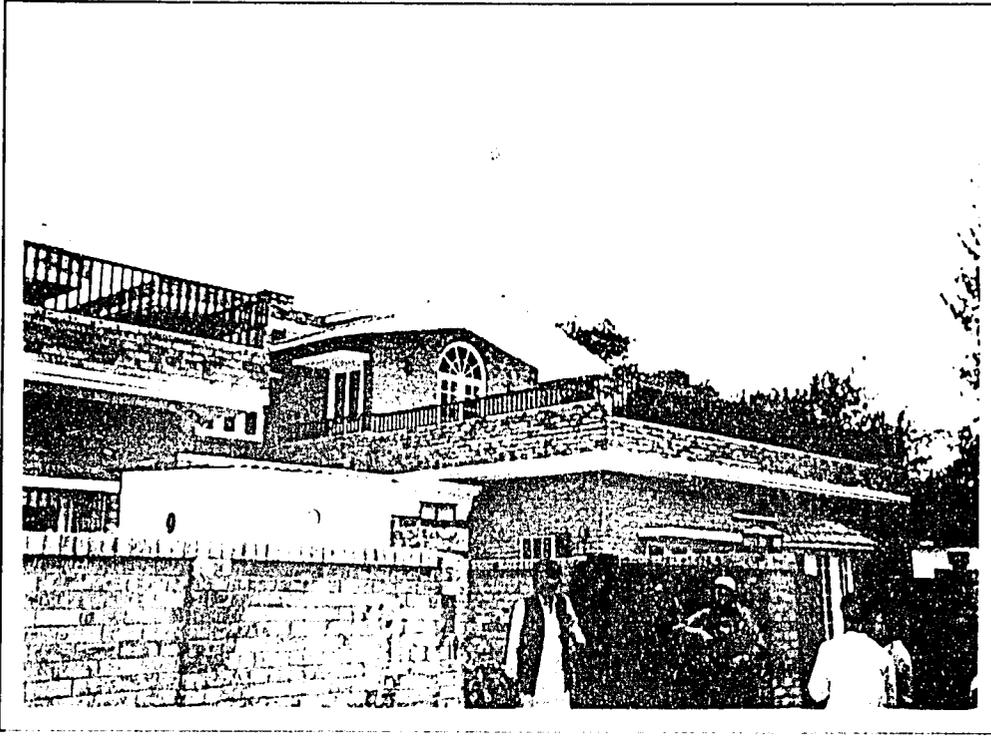


Figure 1 Peshawar CCSC Headquarters Building.

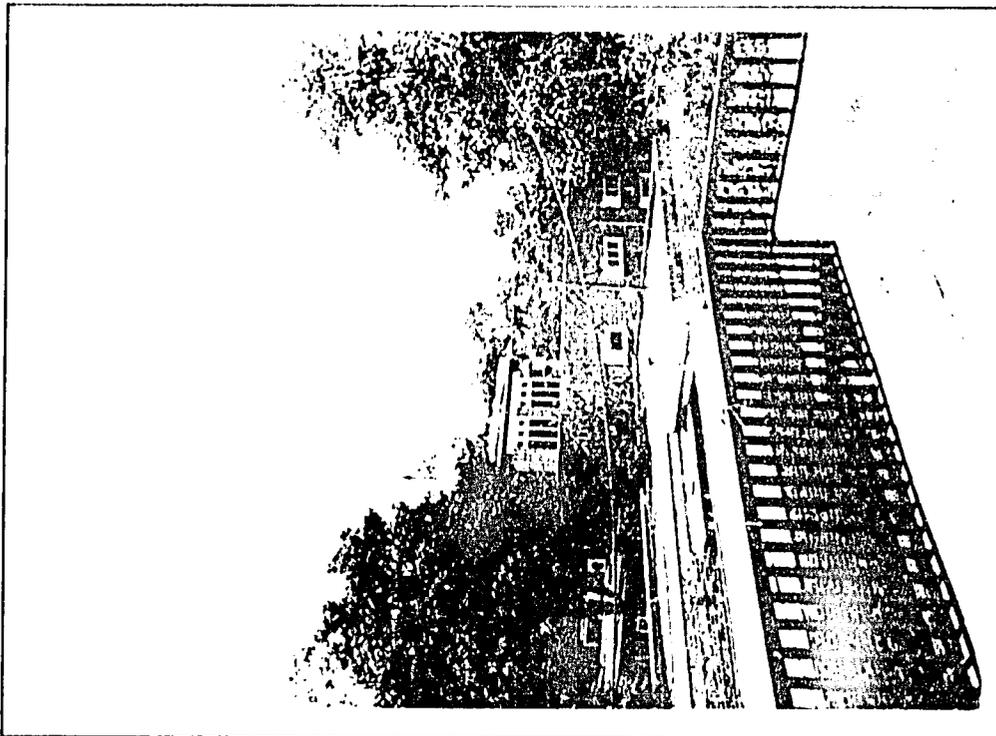


Figure 2 Peshawar CCSC Headquarters Building. View of Building #1 from Building #4. AID VHF CommNet antenna installation.



Figure 3 Peshawar CCSC Headquarters Building. Dispatcher's office, proposed location for BSAA.

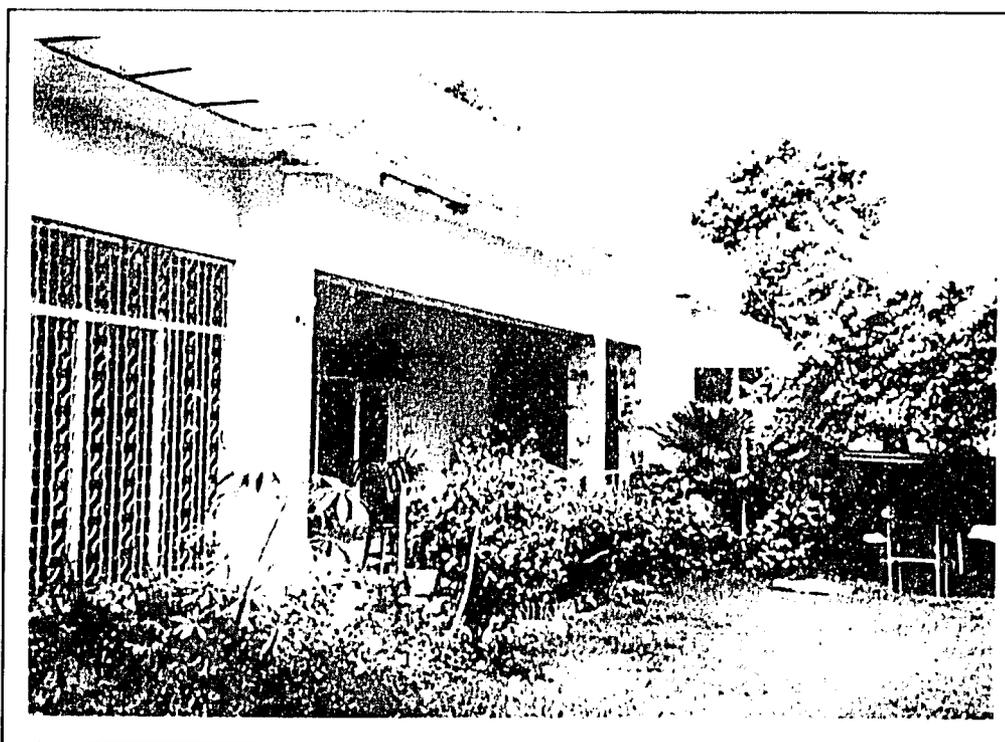


Figure 4 Peshawar CCSC Headquarters Building. Engineer's office, Building # 2 on left side. Dispatcher's office through hallway on right side.

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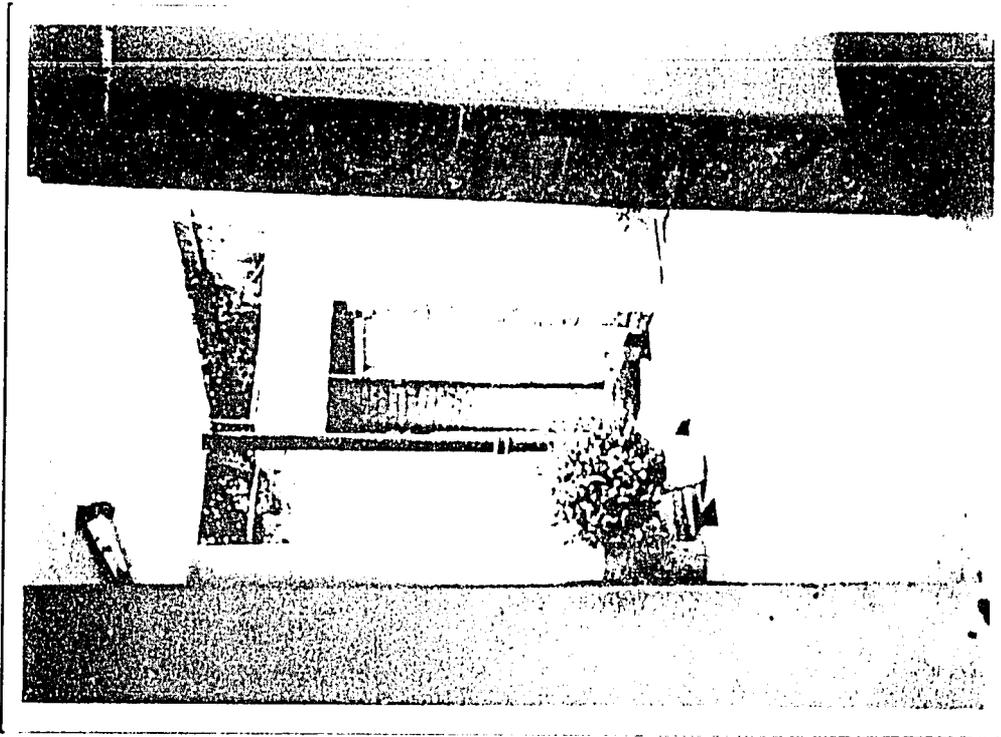


Figure 5 Peshawar CCSC Headquarters Building. Hallway to Dispatcher's Office through archway.

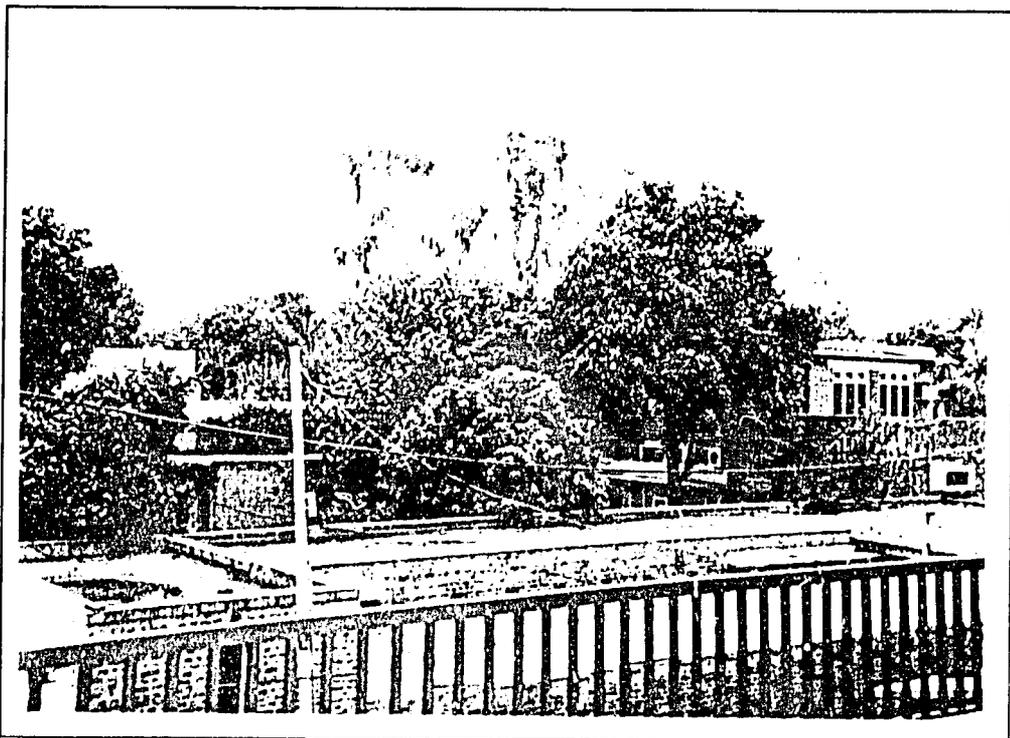
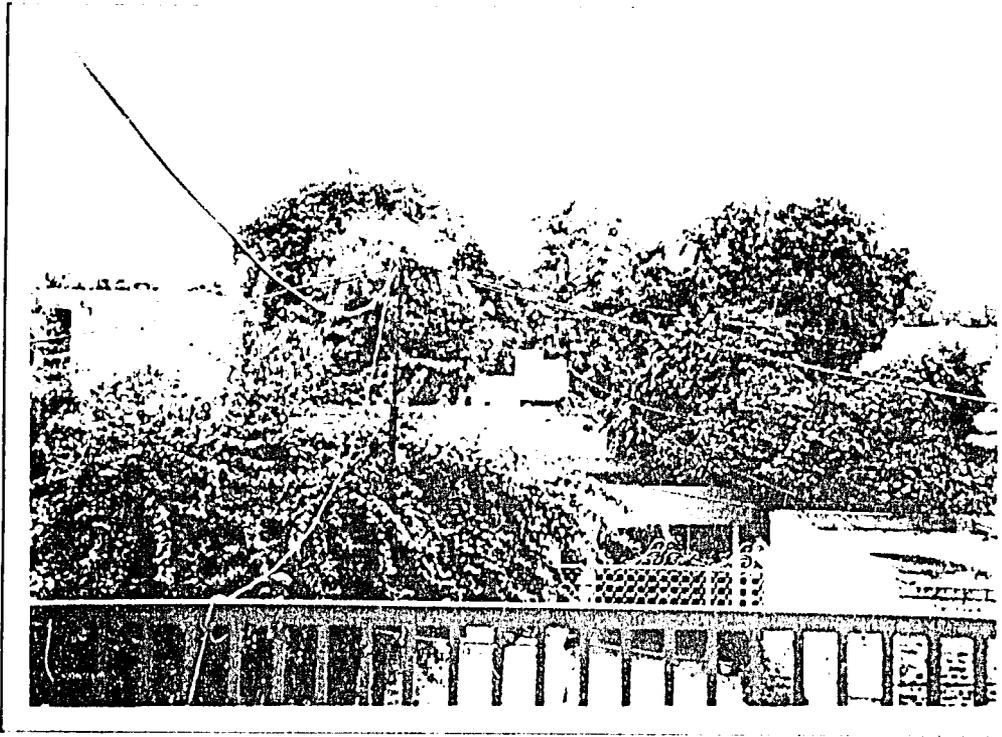
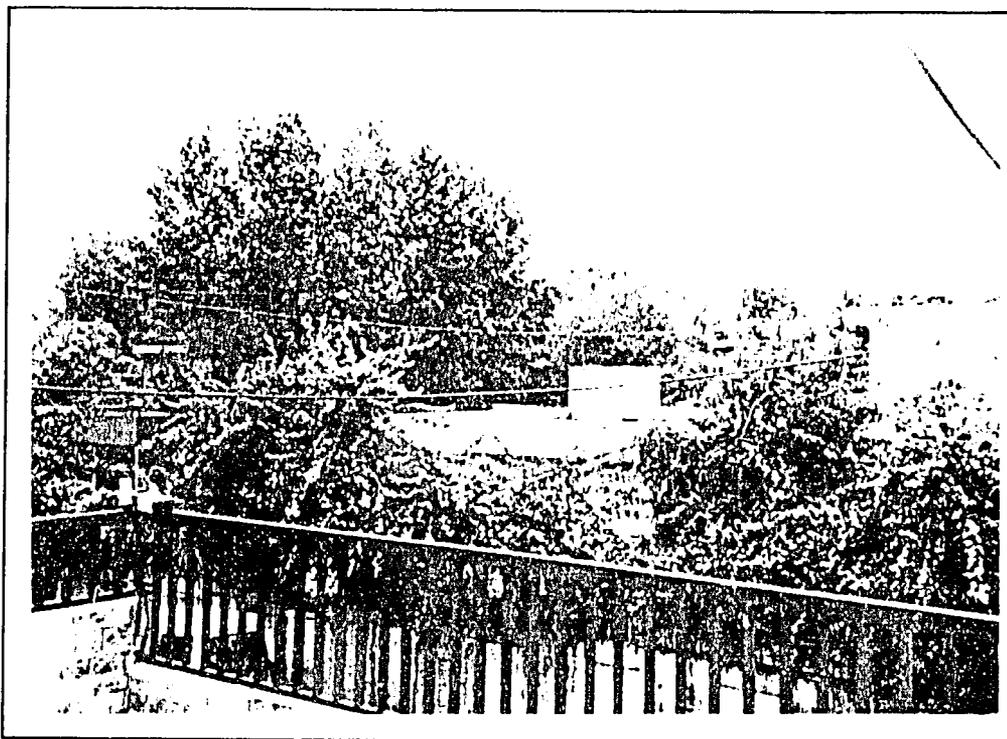


Figure 6 Peshawar CCSC Headquarters Building. View of cable route from Building #2 to Office Annex. Cable run to pole, pole across to annex roof into Dispatcher's office.



**Figure 7** Peshawar CCSC Headquarters Building. View of driveway between Office Annex and Building #1 from Building #4.



**Figure 8** Peshawar CCSC Headquarters Building. View of Building #2 from Building #4. Engineer's Office.

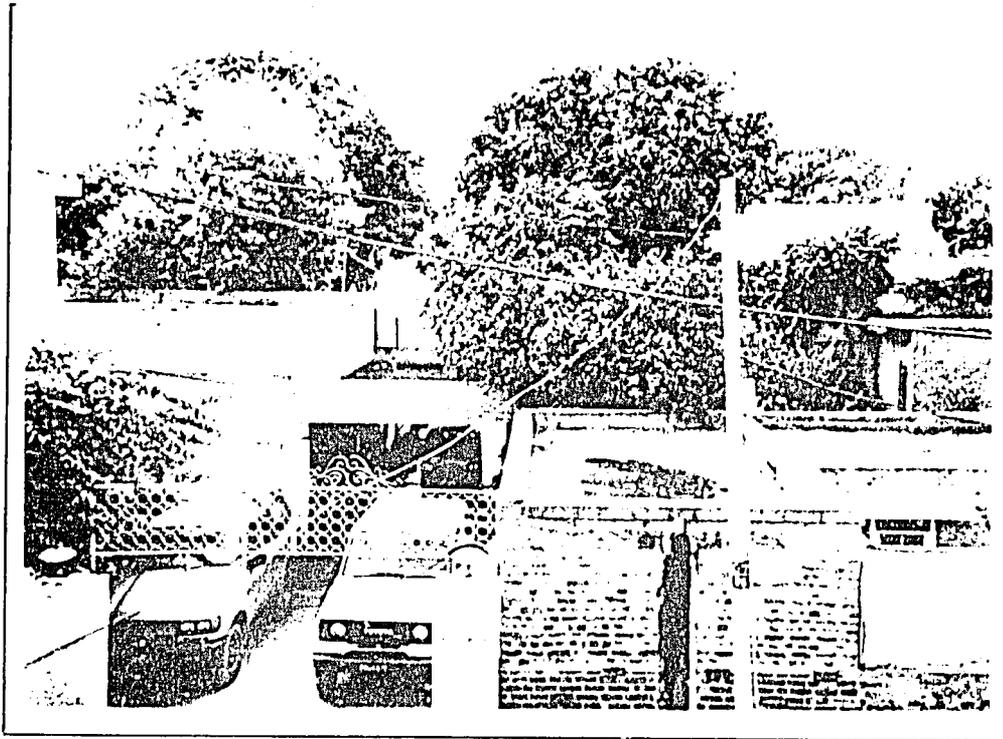


Figure 9 Peshawar CCSC Headquarters Building. View of driveway between Office Annex and Building #2, from Building #4.

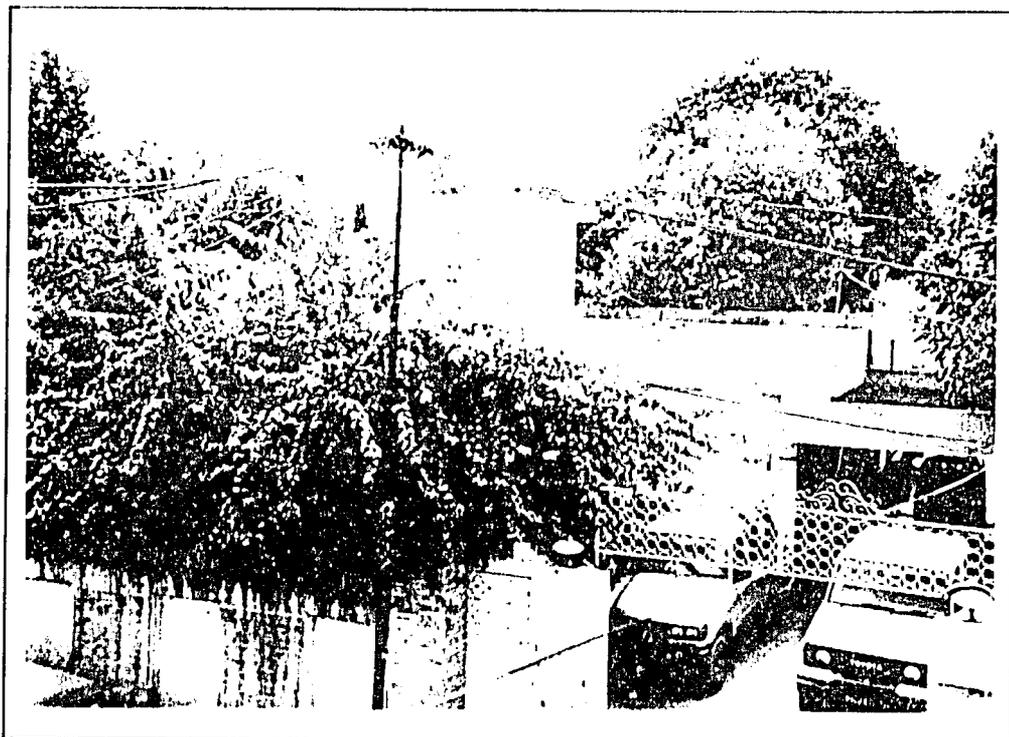


Figure 10 Peshawar CCSC Headquarters Building. View of Building #2 from Building #4.

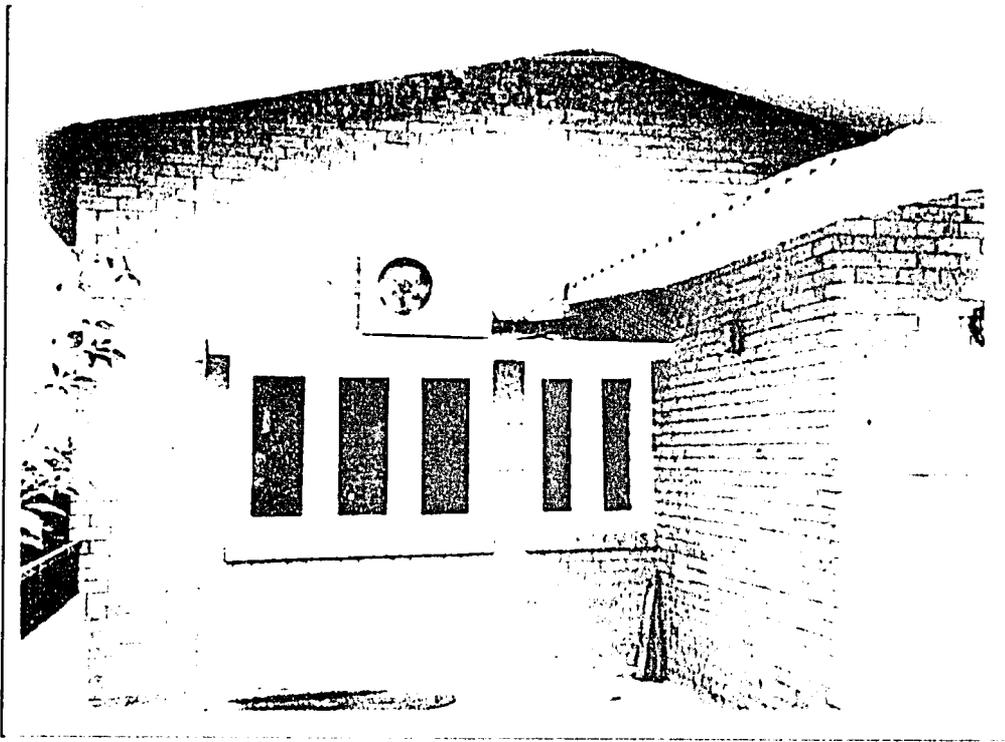


Figure 11 Peshawar CCSC Headquarters Building. View of Director's office location in Building #4. Cable to be run along railing on left, into window frame to reach office.

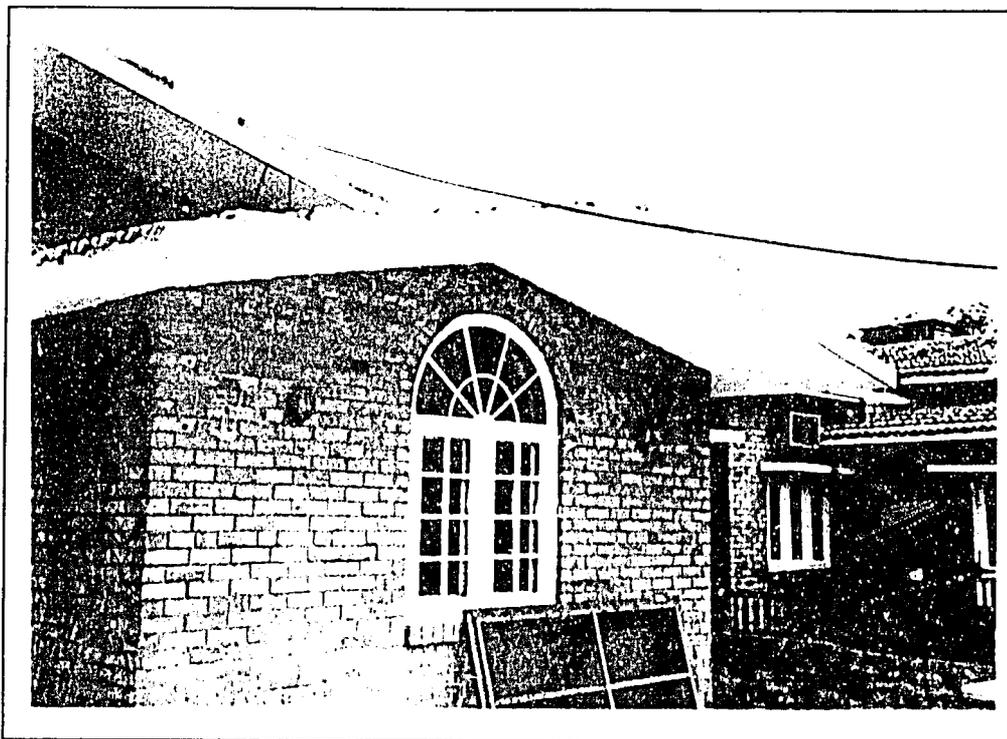


Figure 12 Peshawar CCSC Headquarters Building. Building #4 close-up detail.

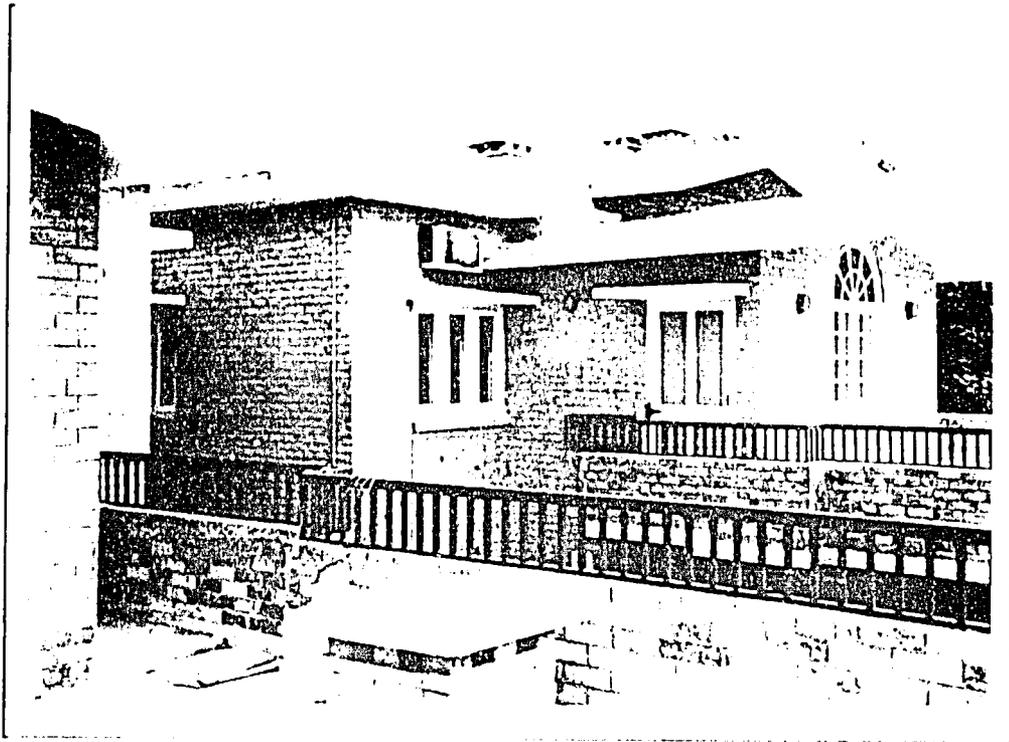


Figure 13 Peshawar CCSC Headquarters Building. View of Building #3 from Building #4.

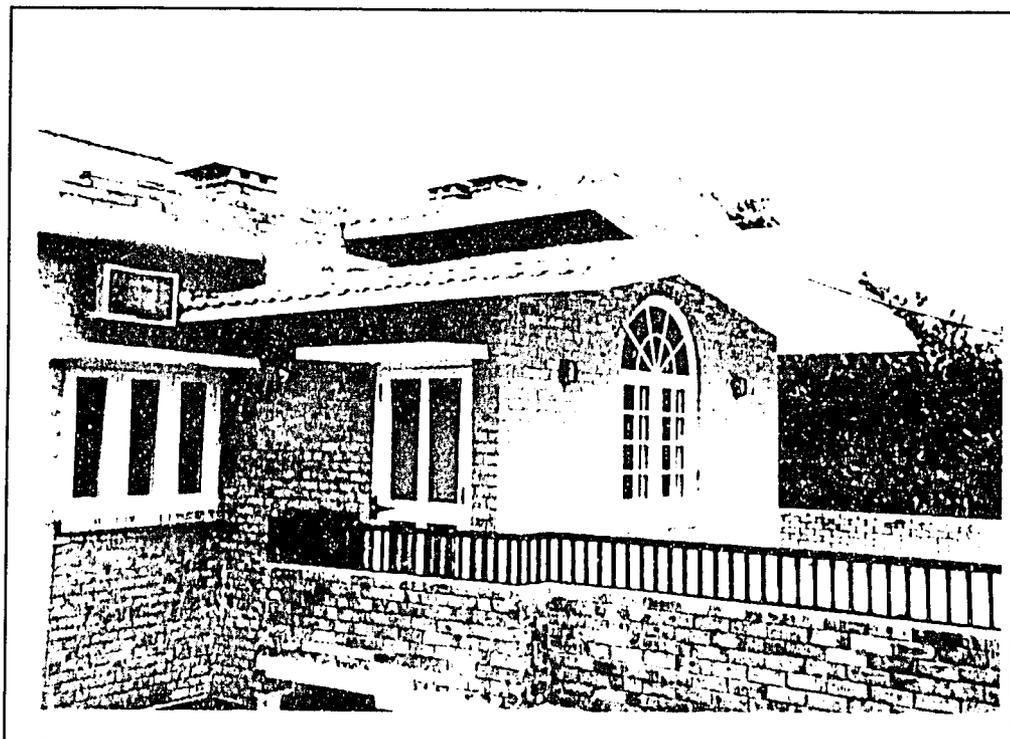


Figure 14 Peshawar CCSC Headquarters Building. View of Building #3 from Building #4.

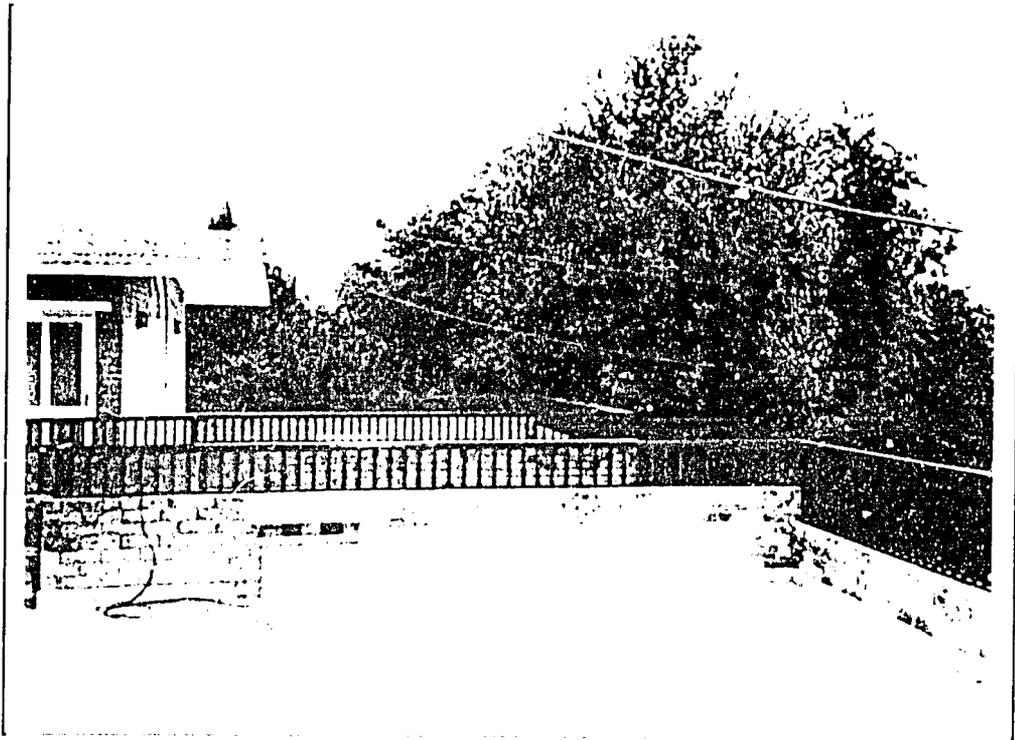


Figure 15 Peshawar CCSC Headquarters Building. View of Building #3 railing taken from Building #4. Cable to be installed along railing with tie-wrap.

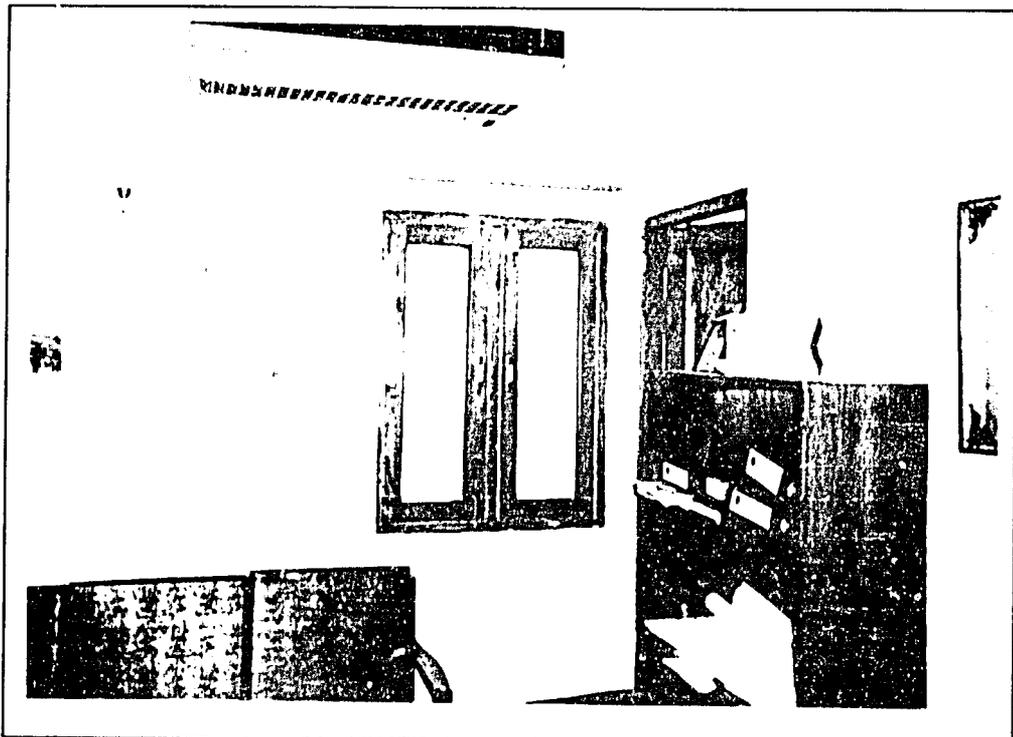


Figure 16 Peshawar CCSC Headquarters Building. Inside view of Director's Office. Cable to enter through window frame, over door, to floor level, along floor to desk location.

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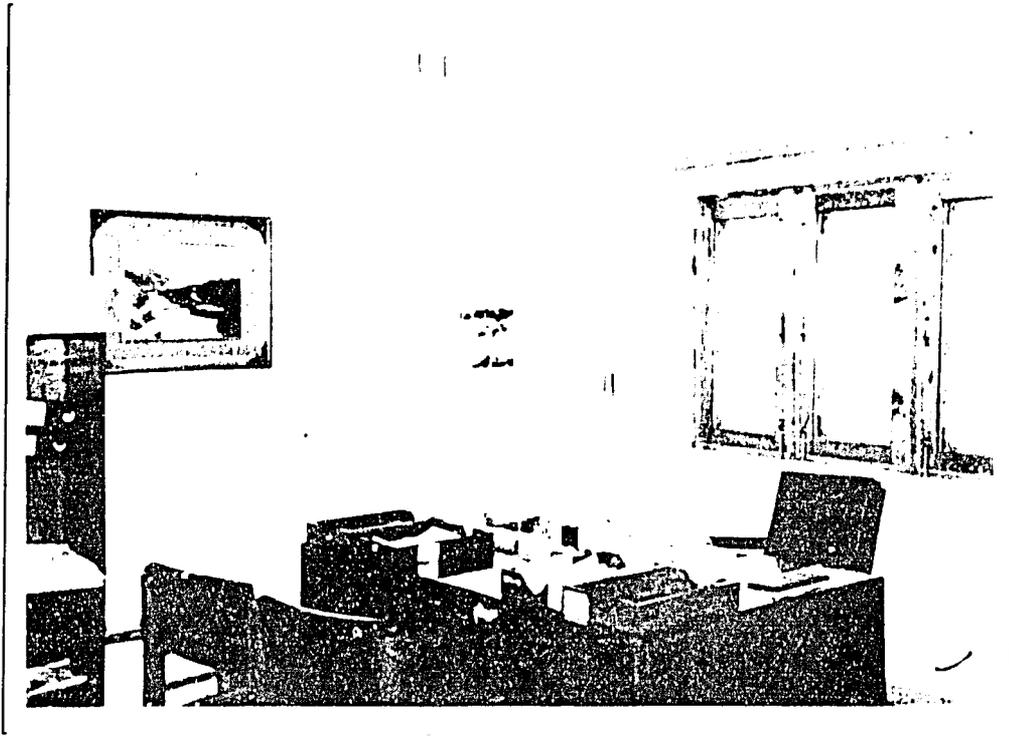


Figure 17 Peshawar CCSC Headquarters Building. Director's office location, place outlet at base of desk.

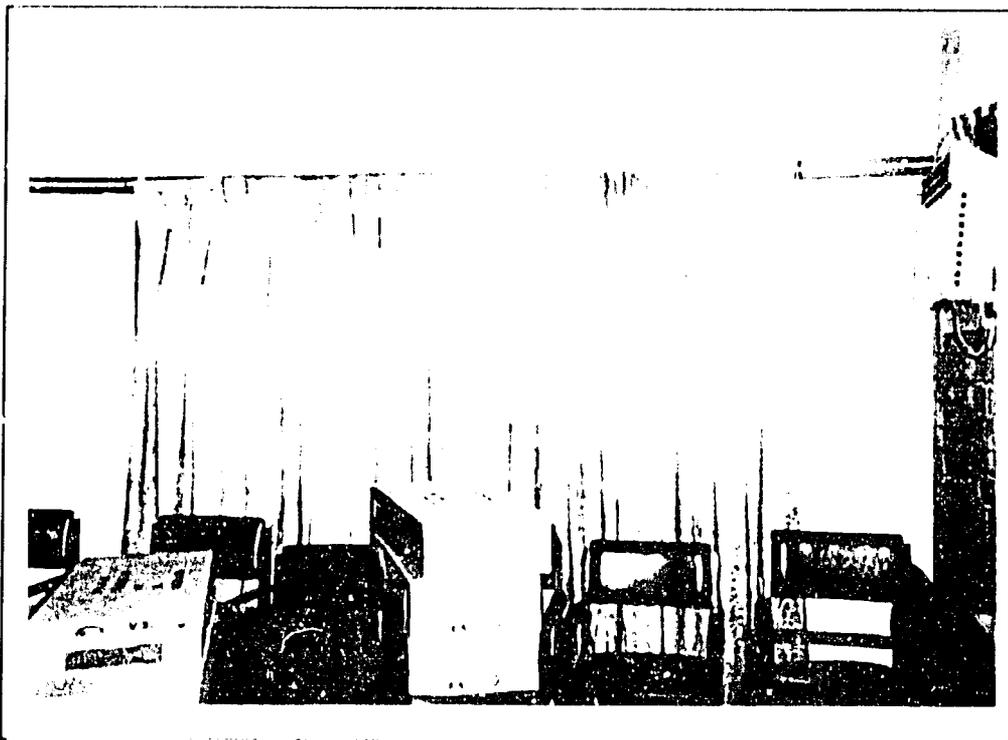


Figure 18 Peshawar CCSC Headquarters Building. TDY room in which Phone #3 will be located. Place outlet at floor level to the left of the window.

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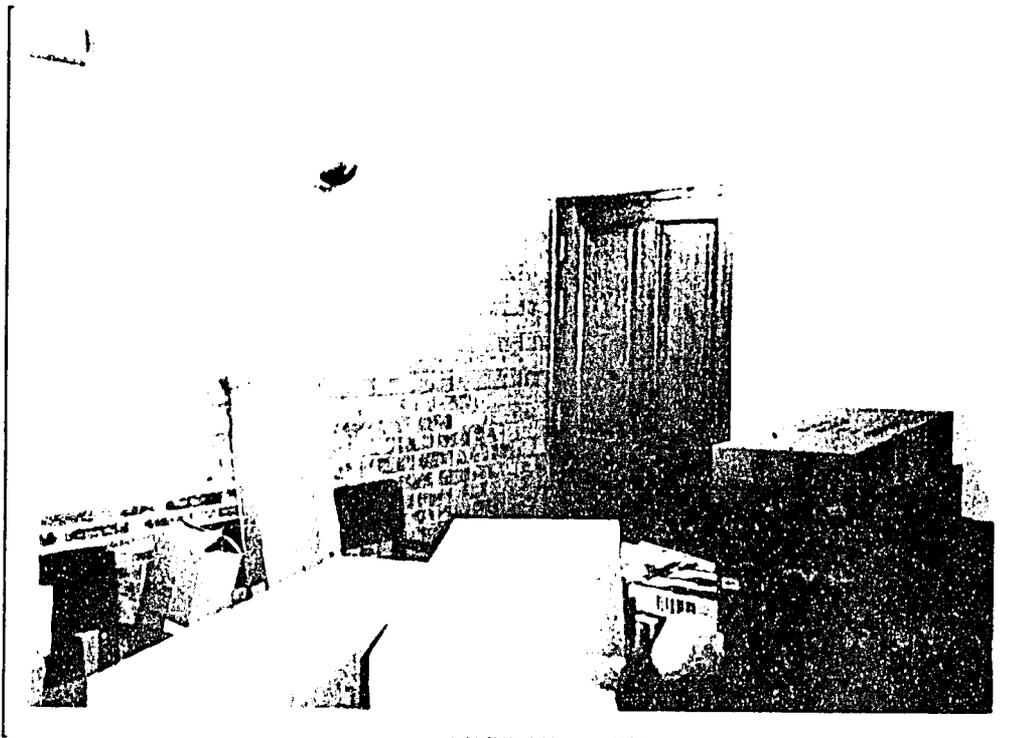


Figure 19 Peshawar CCSC Headquarters Building. TDY room detail to run cable to the Construct Supervisor's office.

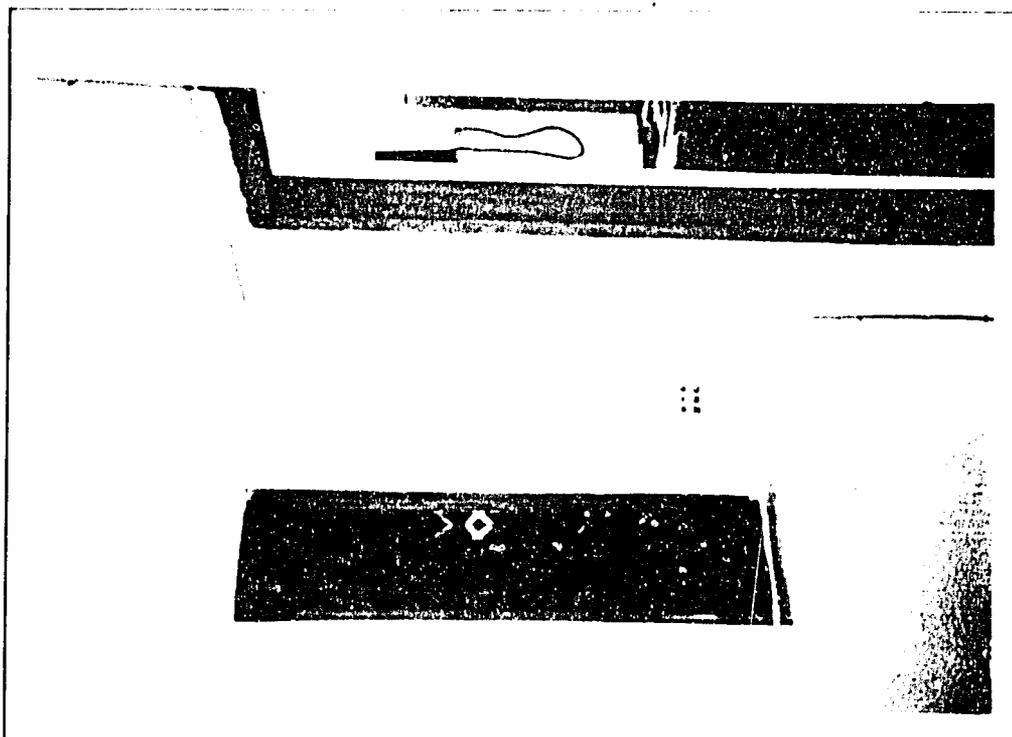


Figure 20 Peshawar CCSC Headquarters Building. Hallway to Construction Supervisor's office. Doorway to office on right.

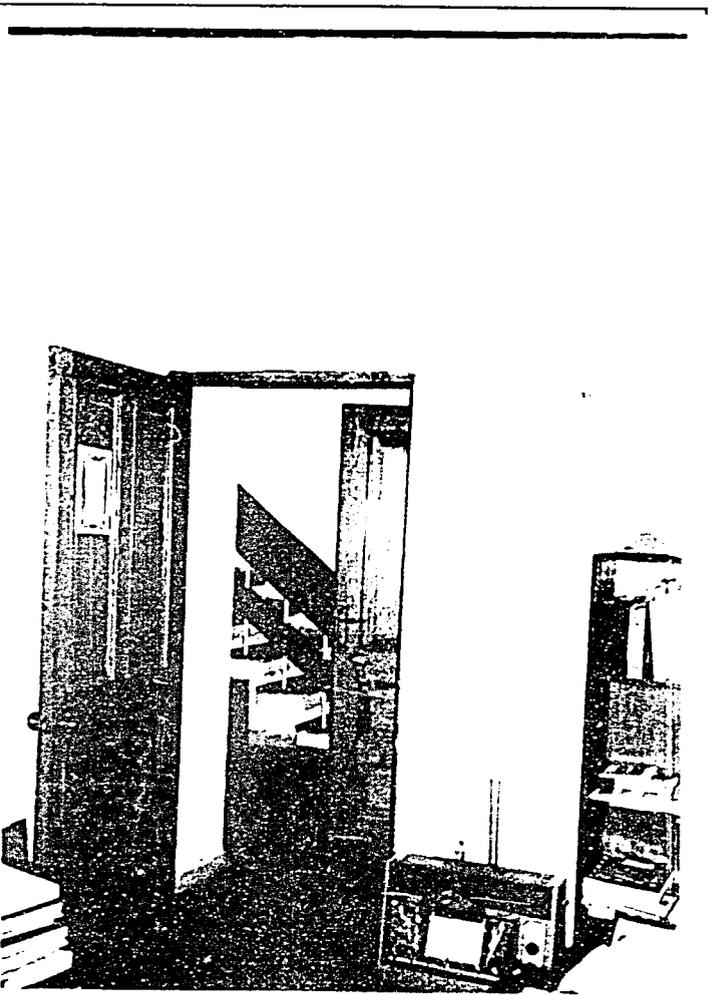


Figure 21 Peshawar CCSC Headquarters Building. Hallway (Fig. 20) viewed from inside Construction Supervisor's office. Route cable to right side of office.

Site Photographs

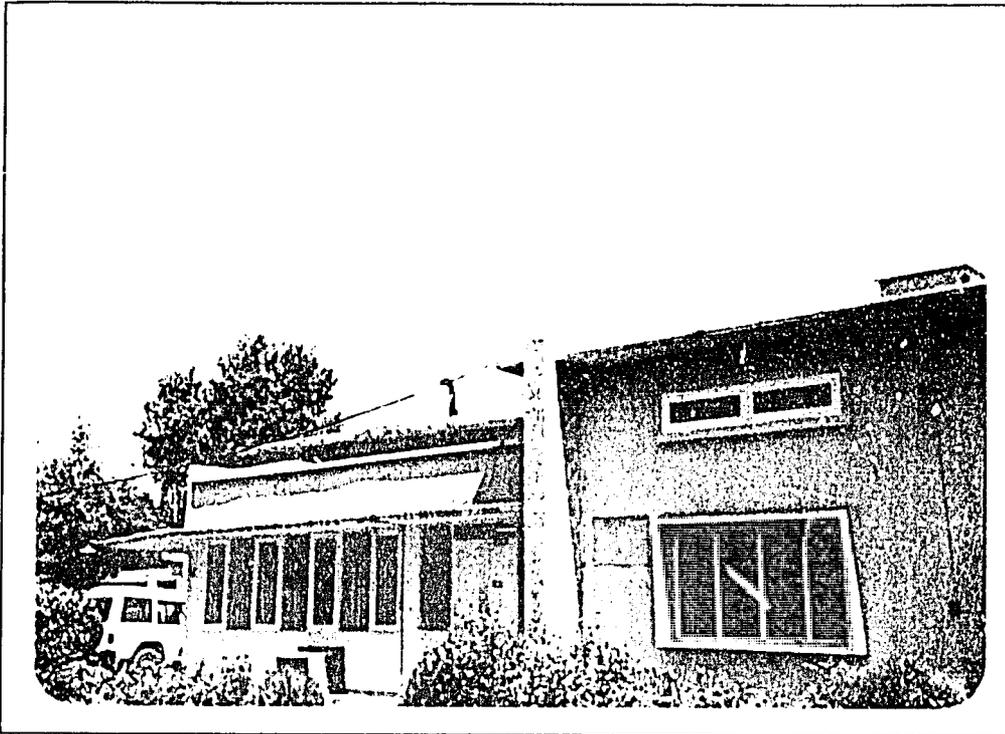


Figure 1 Peshawar DAI Office Facility. Viewed from southeast corner of property.

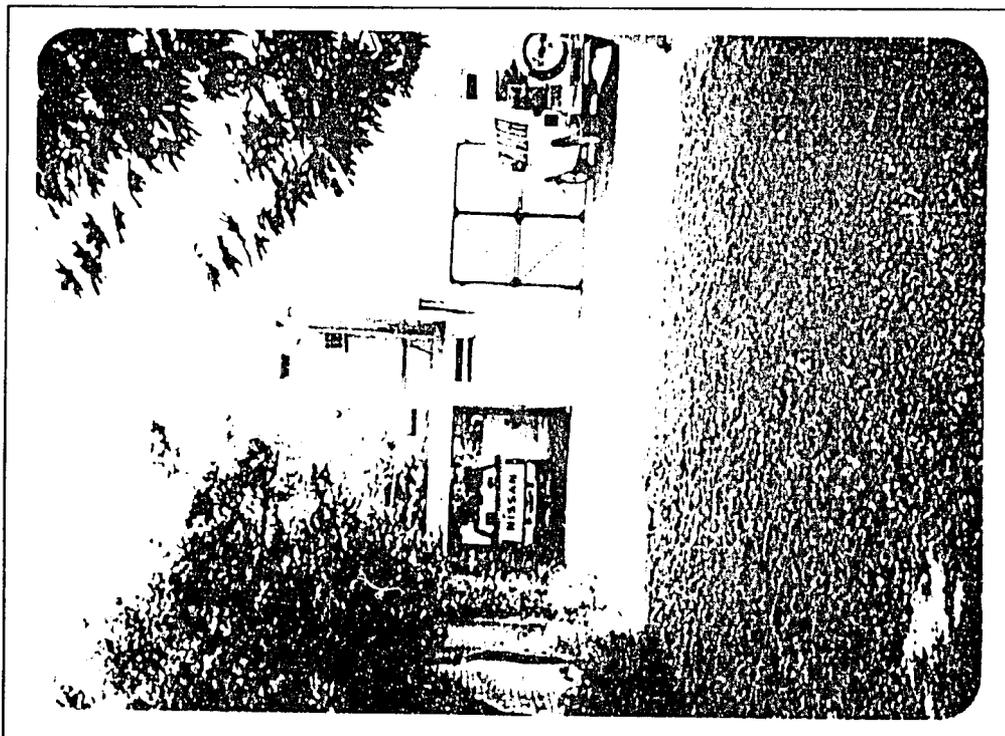


Figure 2 Peshawar DAI Office Facility. View from front gate. Proposed equipment room located on second floor (air conditioner location).

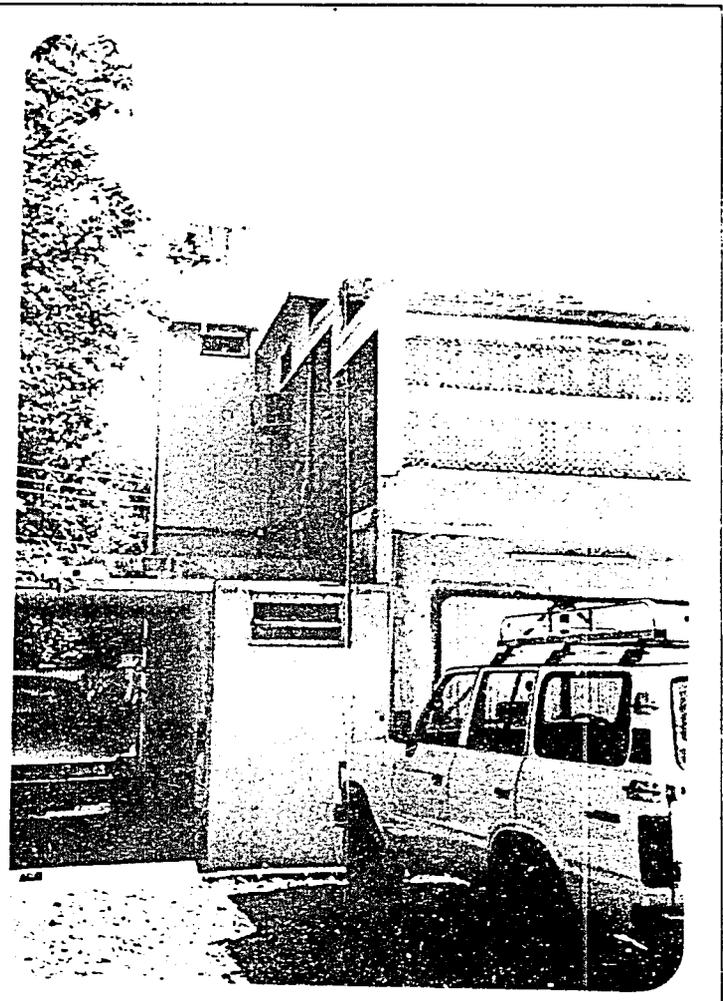


Figure 3 Peshawar DAI Office Facility. Proposed equipment room location behind air conditioner.

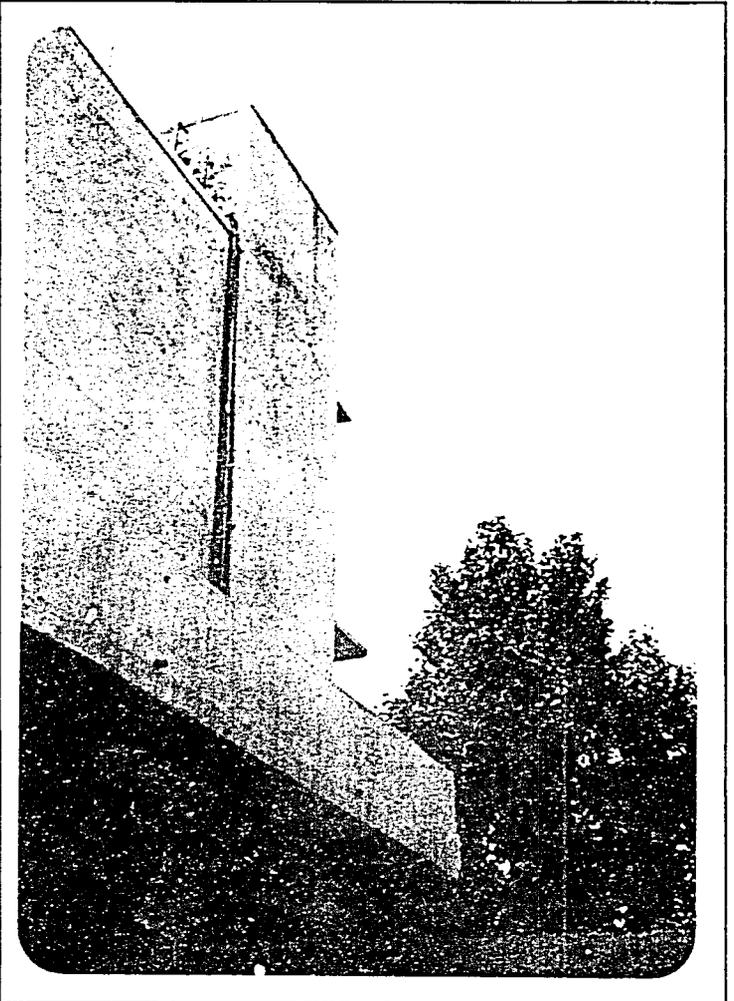
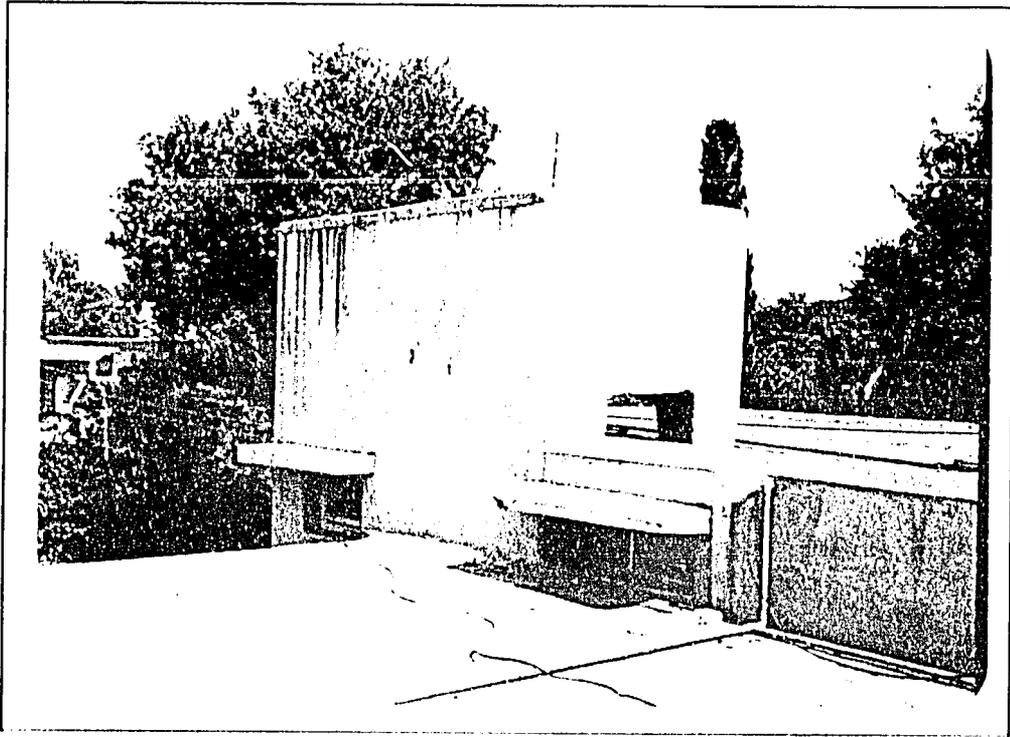
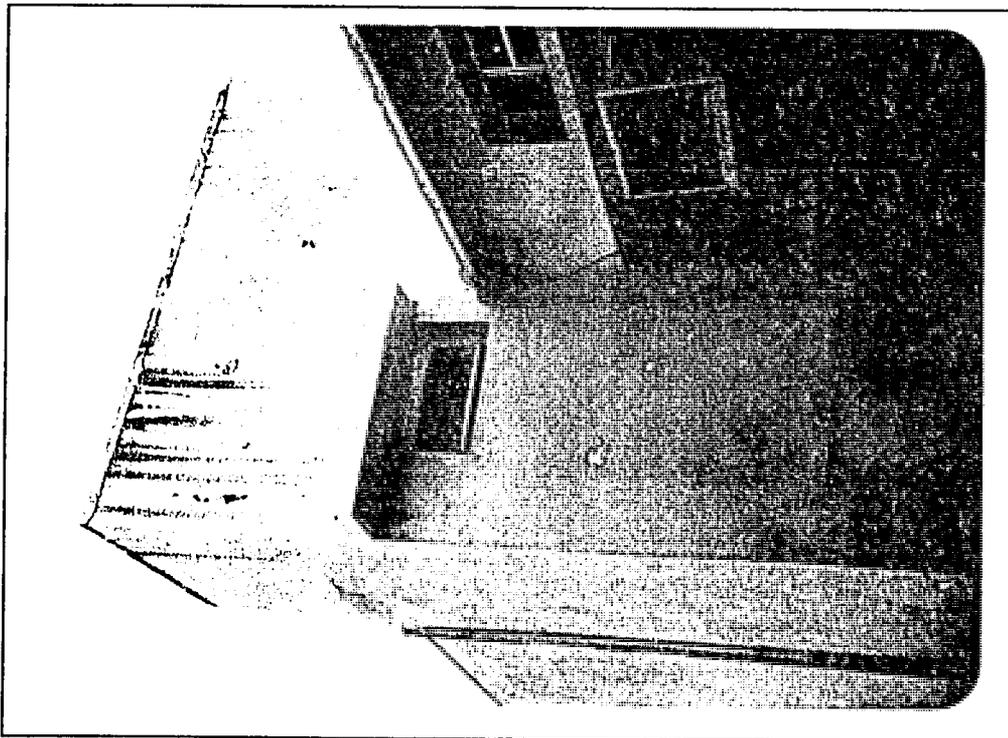


Figure 4 Peshawar DAI Office Facility. Possible antenna mast location against wall. Water tank located on top of wall section.



**Figure 5** Peshawar DAI Office Facility. Water tank located adjacent to roof (below) of proposed equipment room. Possible location for small antenna mast.



**Figure 6** Peshawar DAI Office Facility. Equipment room right side. Water tank (possible antenna mast support location) upper center and right.

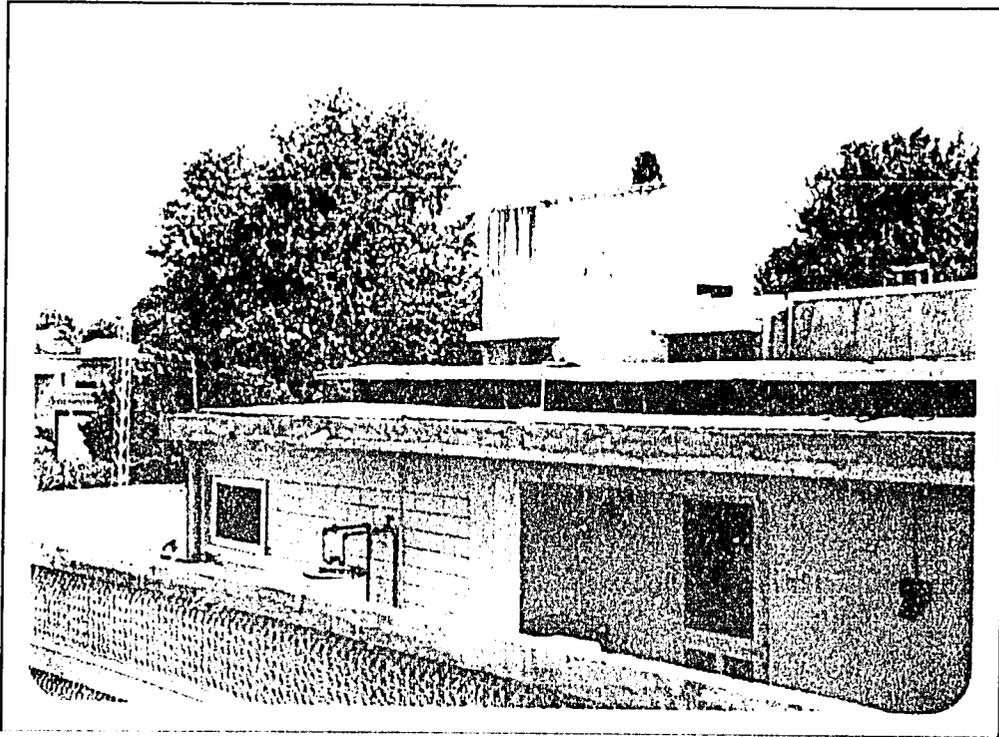


Figure 7 Peshawar DAI Office Facility. View of water tank adjacent to proposed equipment room viewed from front roof of building.

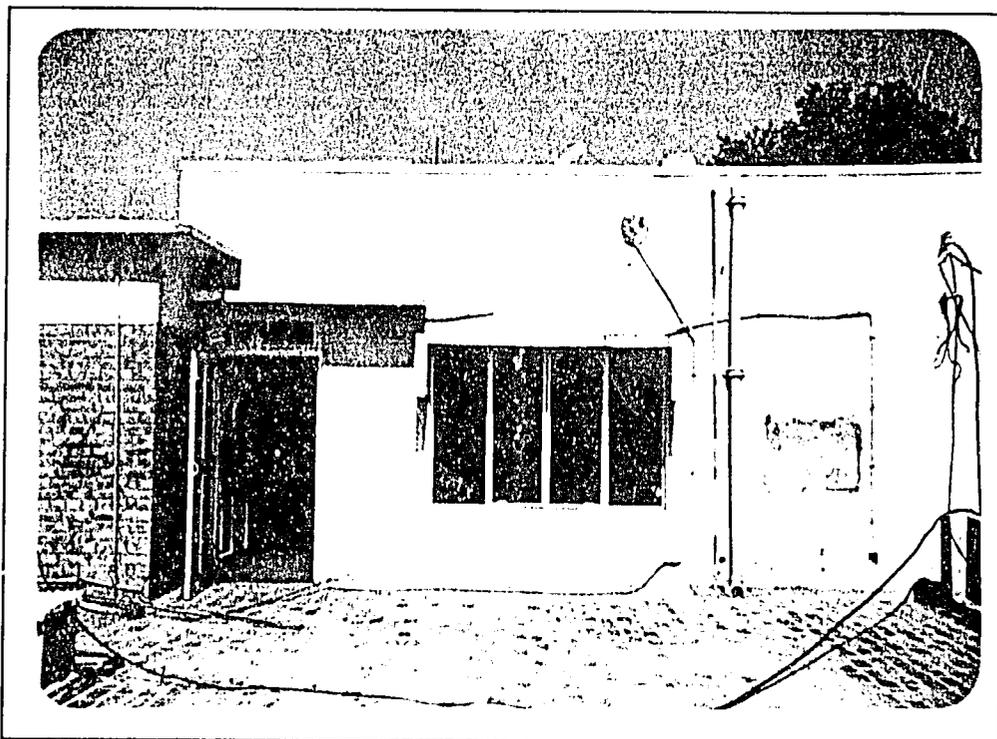
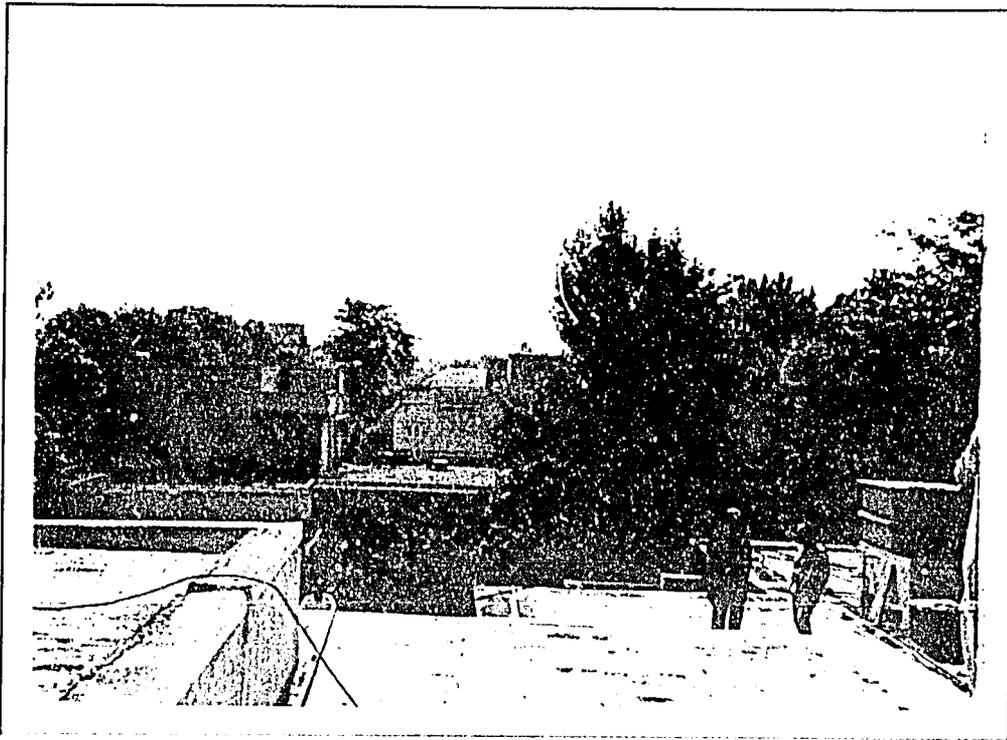
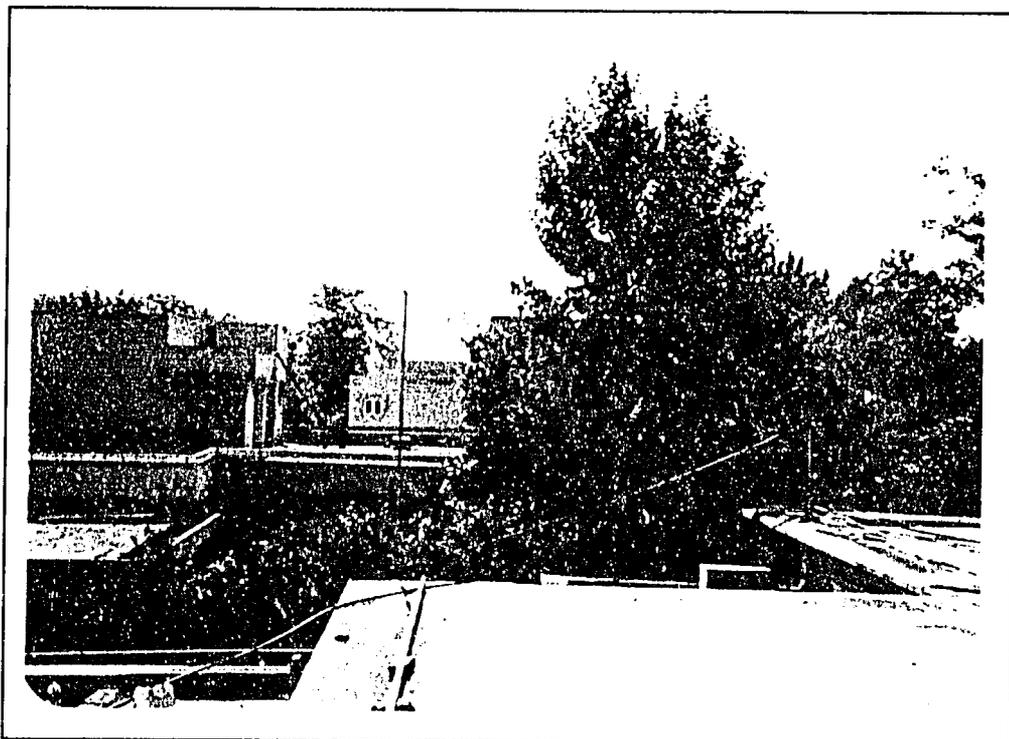


Figure 8 Peshawar DAI Office Facility. Exit to roof opposite equipment room.



**Figure 9** Peshawar DAI Office Facility. View from roof facing toward Pabbi (East).



**Figure 10** Peshawar DAI Office Facility. Closeup view of structures adjacent to DAI facility. (Facing East).

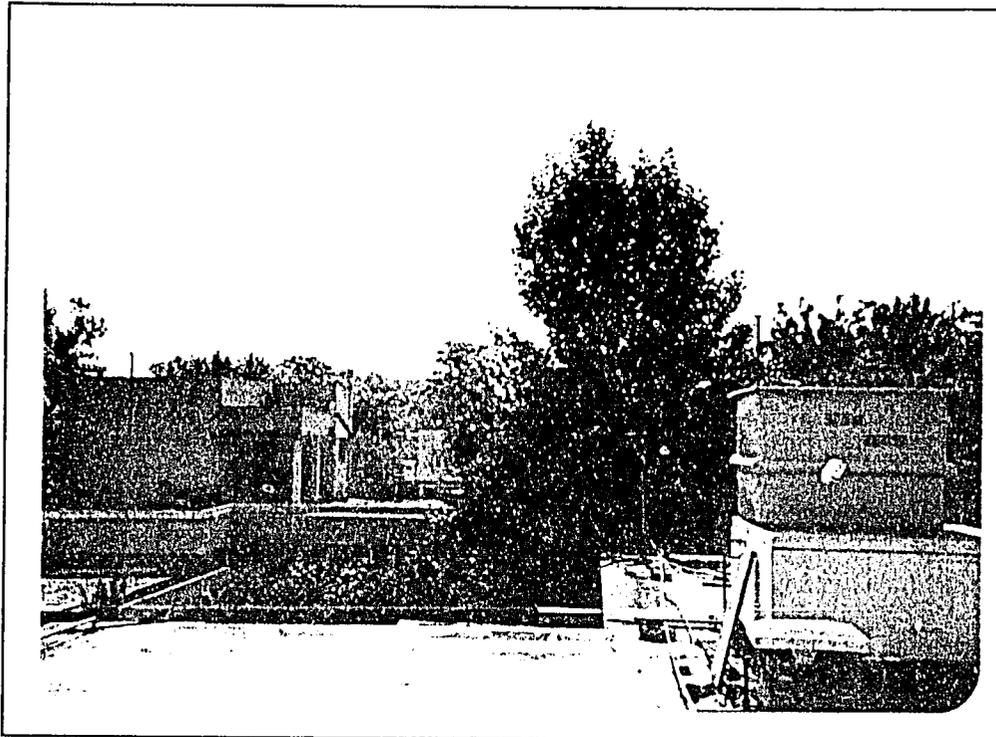


Figure 11 Peshawar DAI Office Facility. View facing East from lower level of DAI roof.

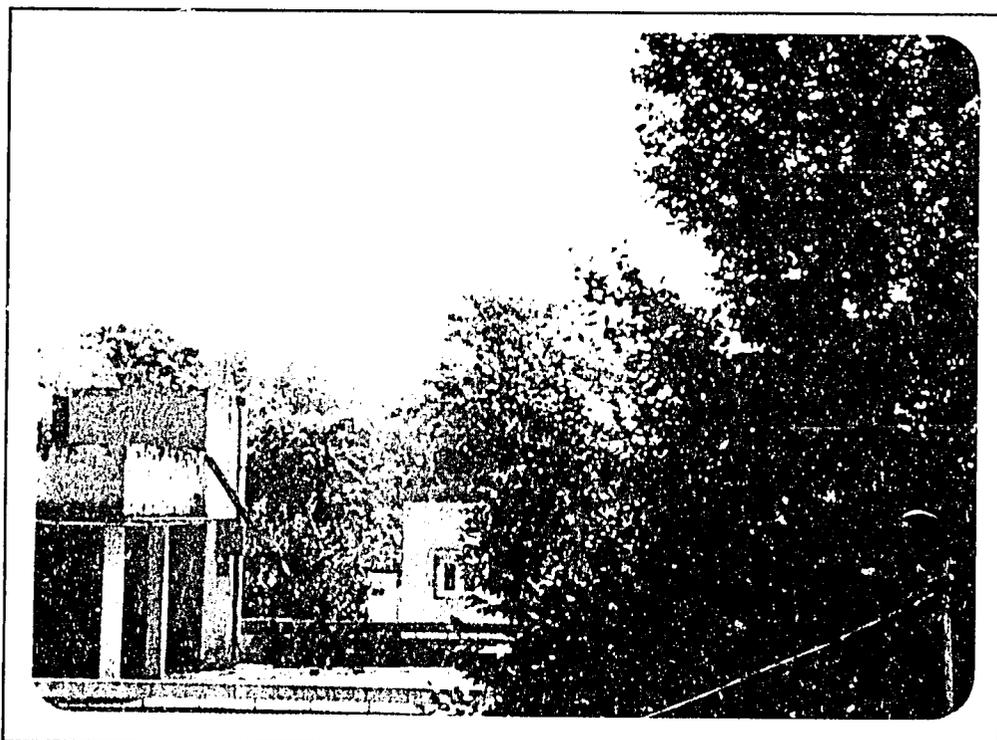
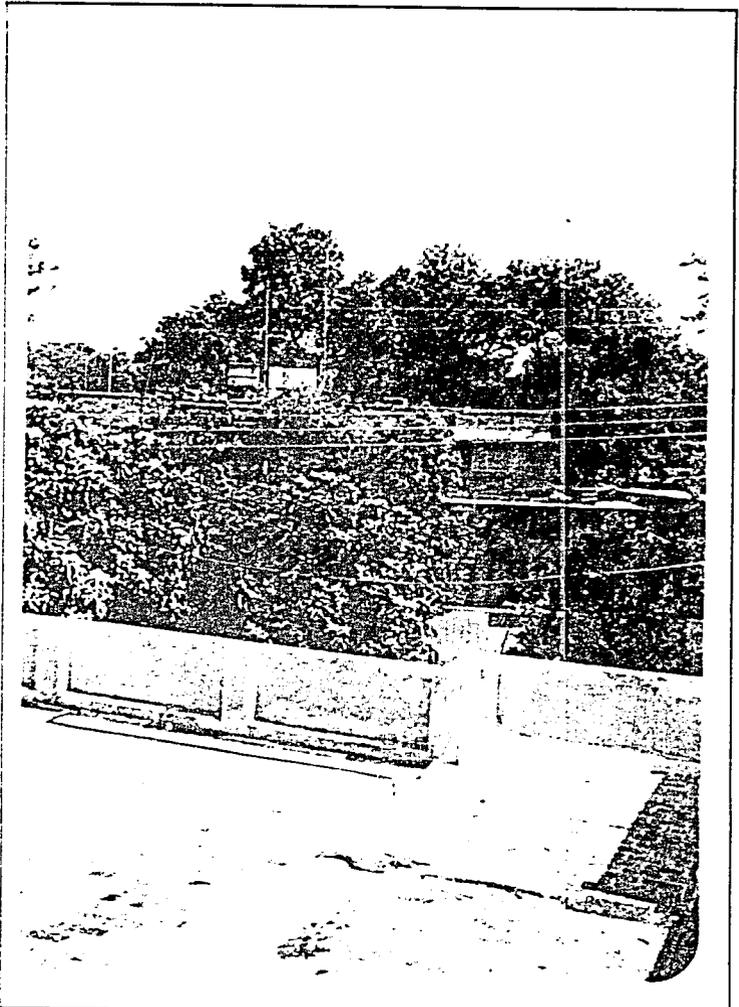
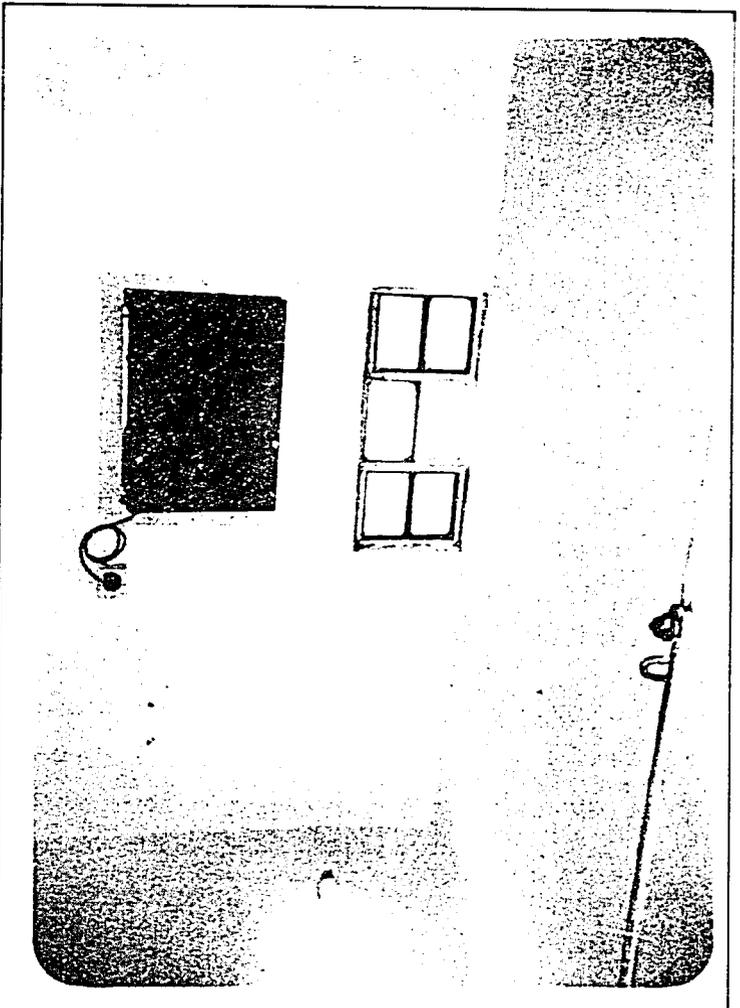


Figure 12 Peshawar DAI Office Facility. Telephoto view from DAI roof (facing East). Water tower in trees (photo center).



**Figure 13** View of AID motor pool facility from DAI facility roof. AID VHF antenna in center, with HF dipole to left of VHF mast.



**Figure 14** Peshawar DAI Office Facility. Proposed equipment room, air conditioner and window. Window frame would be exit point for coaxial cable to antenna.

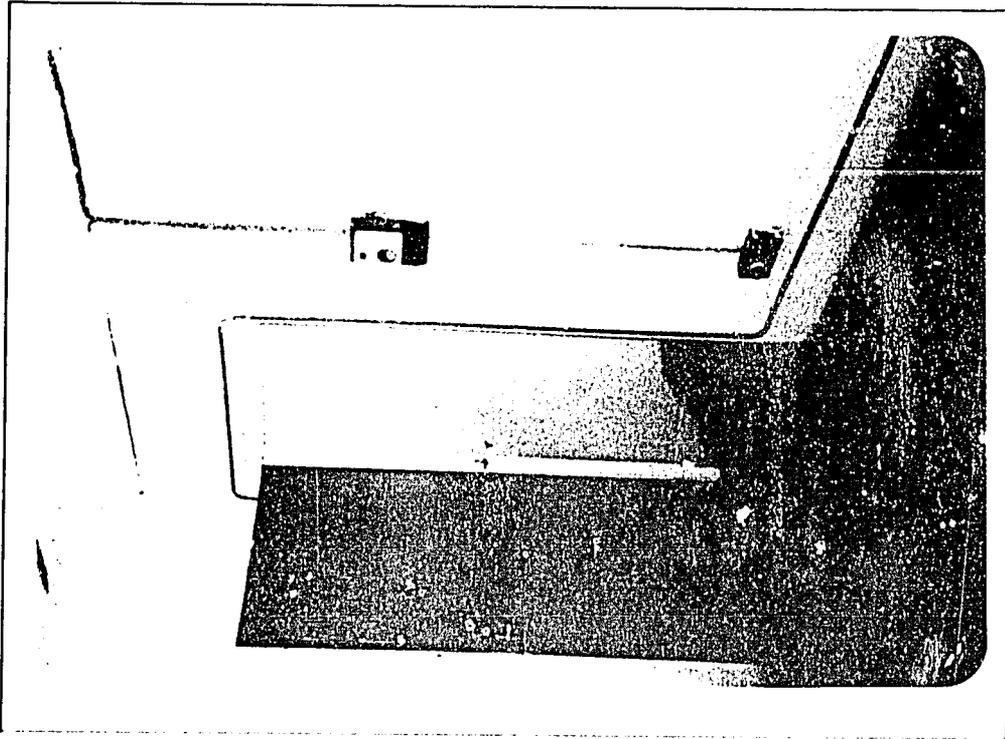


Figure 15 Peshawar DAI Office Facility. Entrance to proposed equipment room.

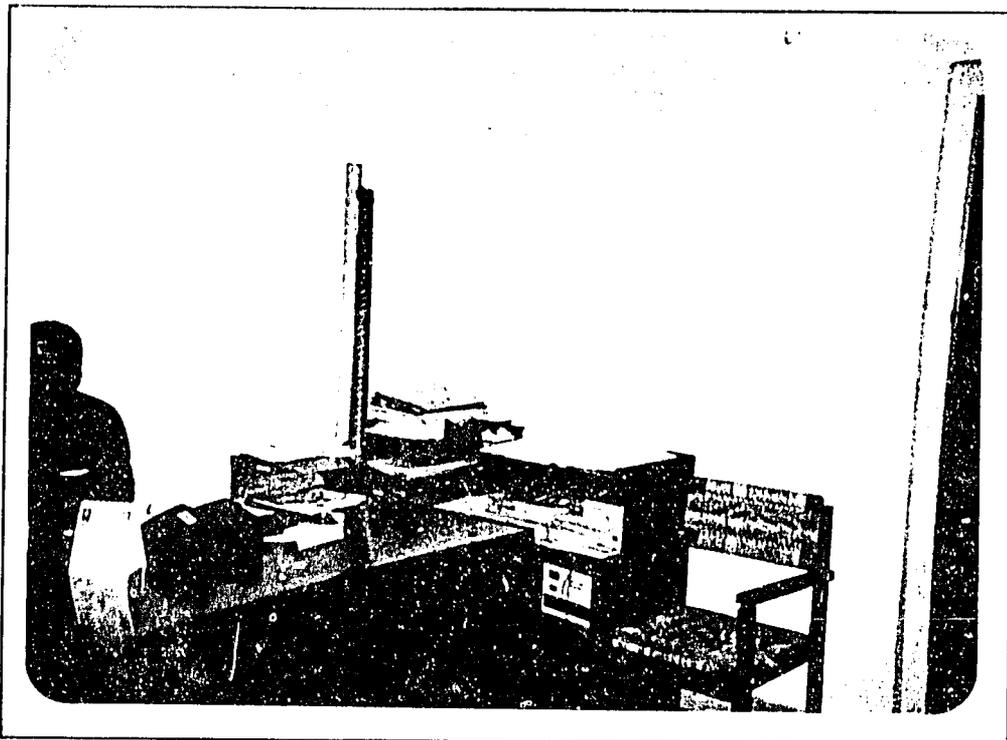


Figure 16 Peshawar DAI Office Facility. Surveyor's office, phone to be located on top of bookcase.

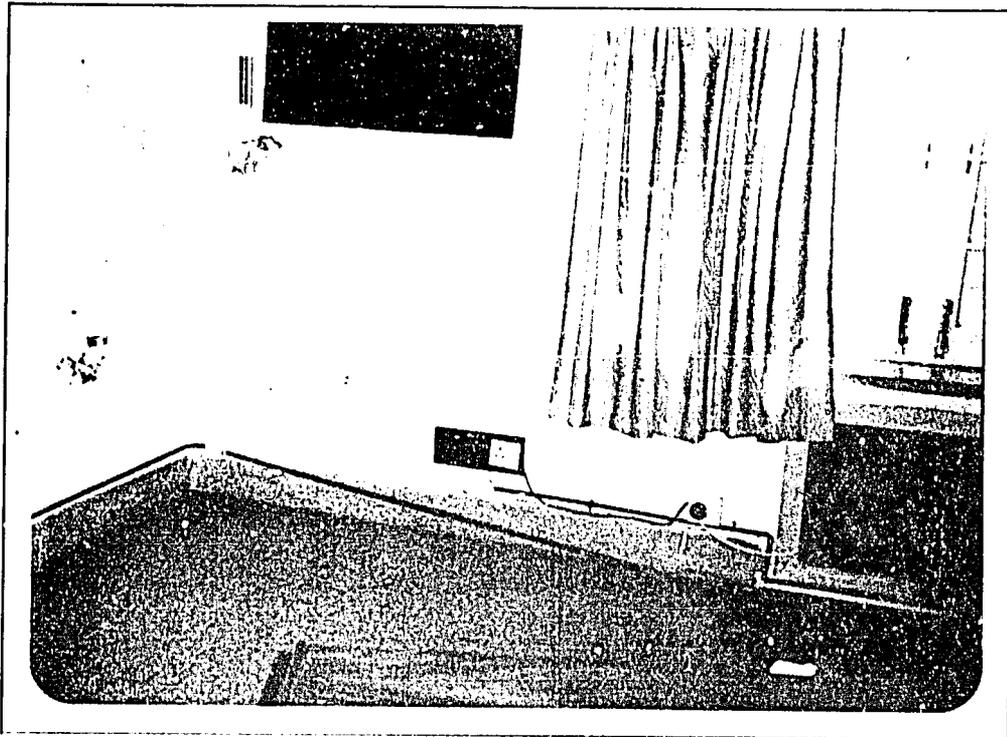


Figure 17 Peshawar DAI Office Facility. Director's Office. Cable to be run from hallway into room along existing PVC conduit to corner.

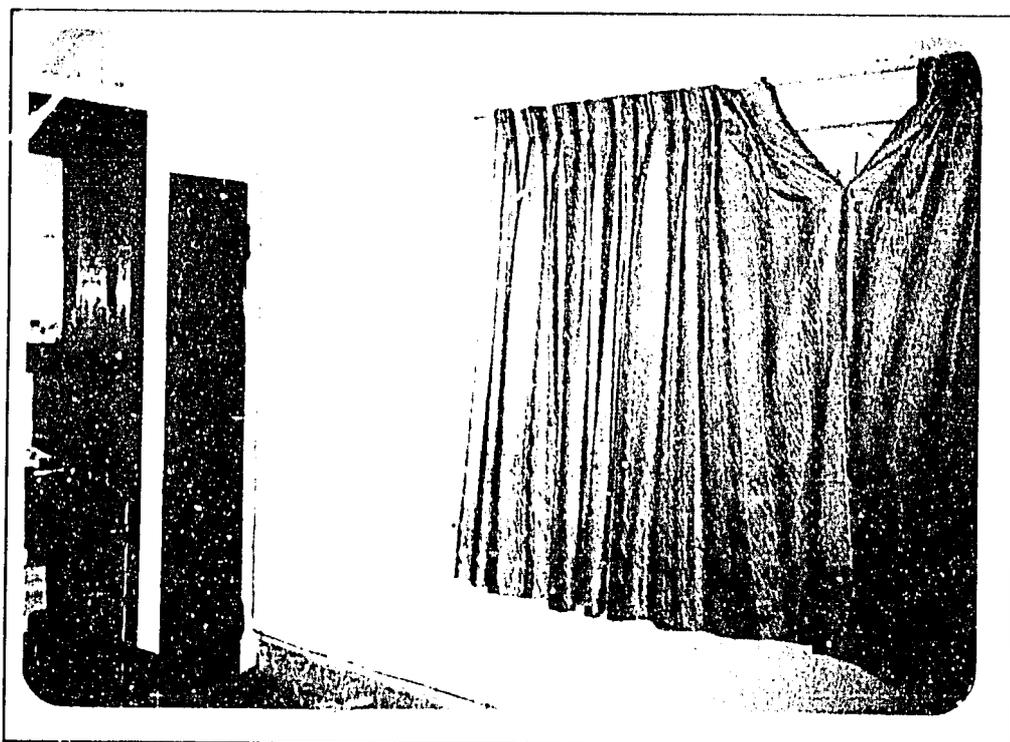


Figure 18 Peshawar DAI Office Facility. Secretary's office, run cable through door frame along wall to small table in corner.

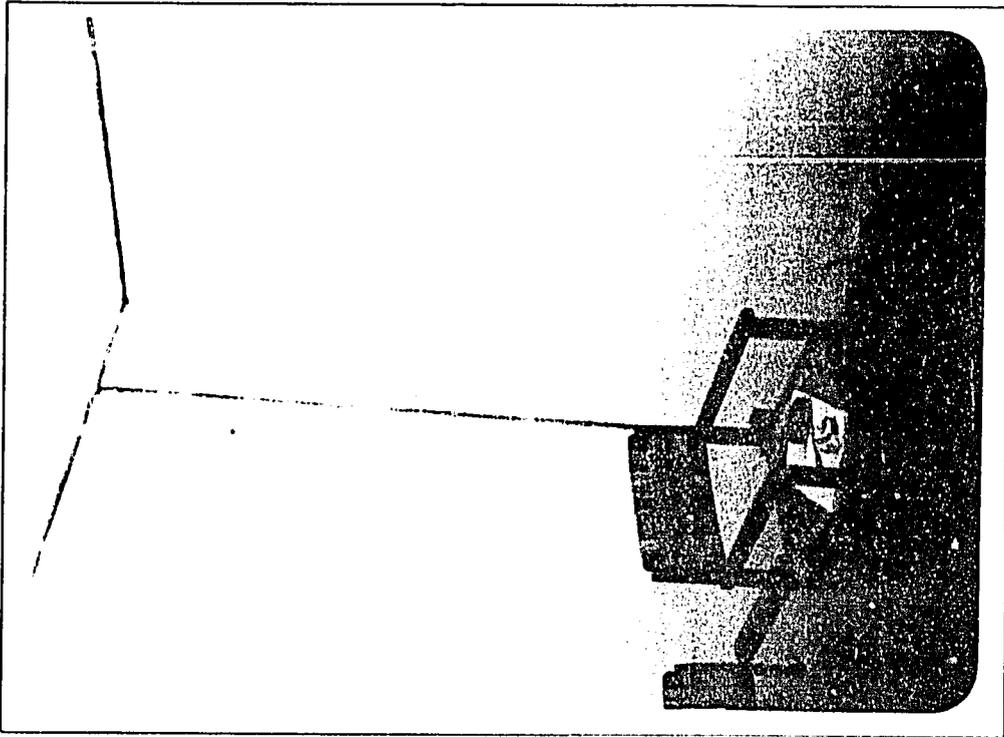


Figure 19 Peshawar DAI Office Facility. Secretary's office. Use existing PVC conduit for cable runs.

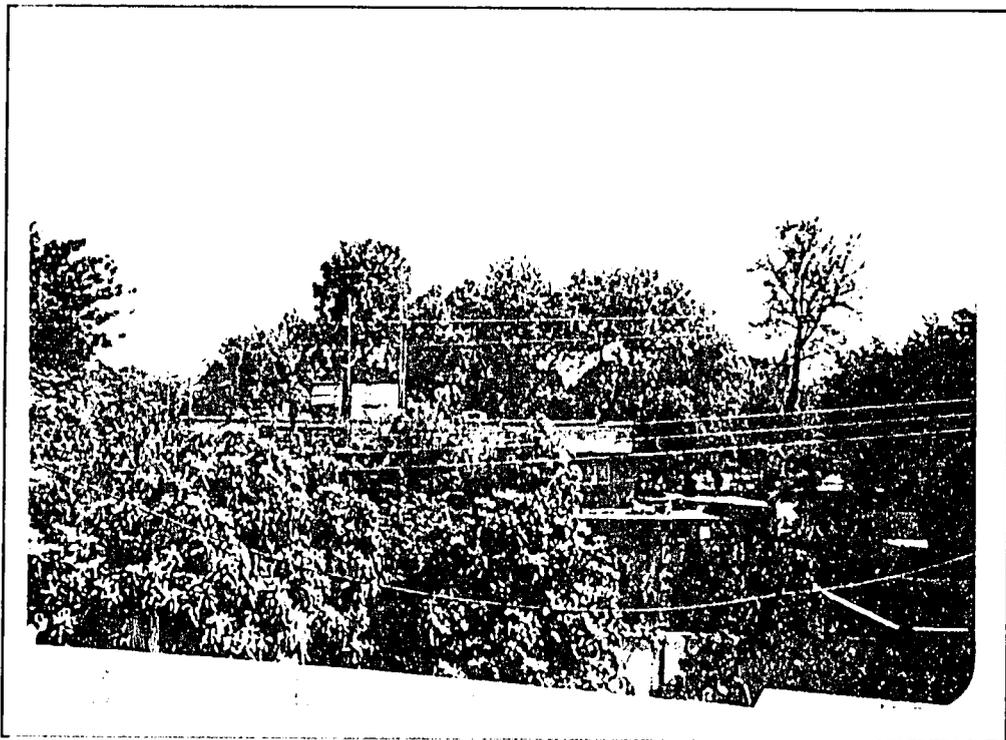


Figure 20 AID Motor Pool Facility. VHF and HF antenna installations.

Site Photographs

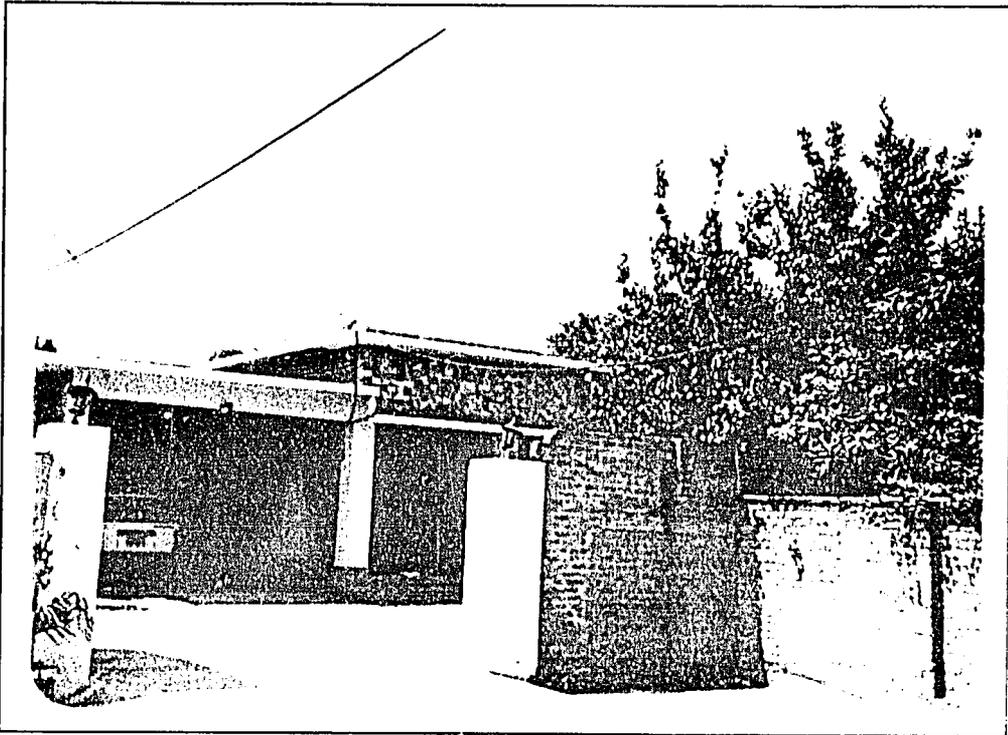


Figure 1 Peshawar VITA Office Facility.

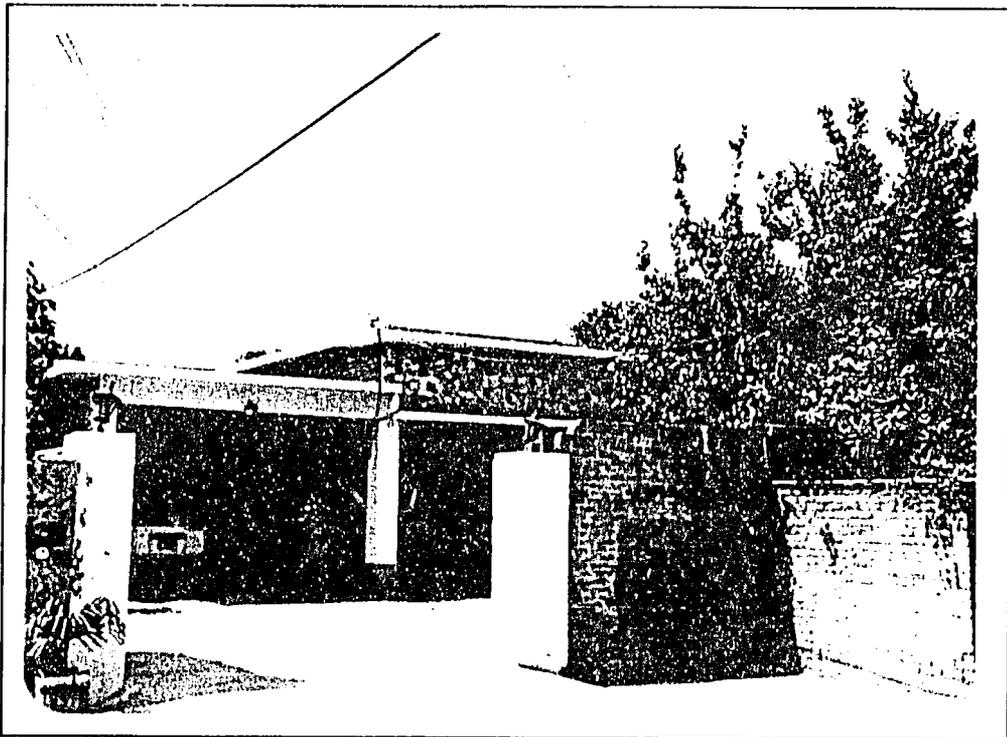


Figure 2 Peshawar VITA Office Facility.

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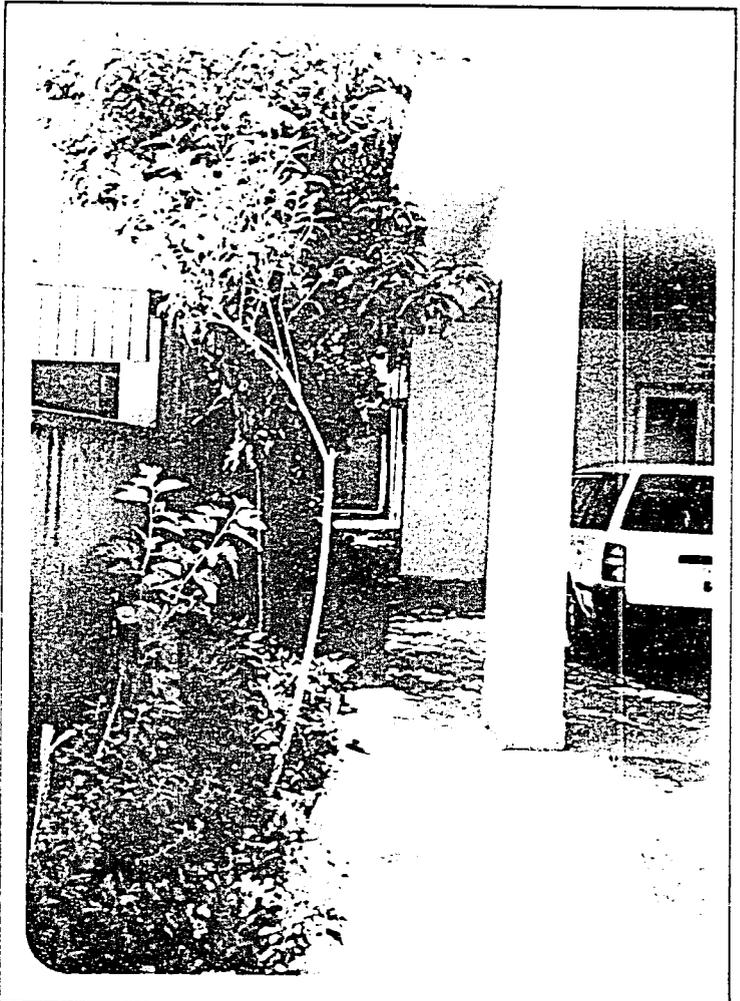


Figure 3 Peshawar VITA Office Facility. Left hand side of property.

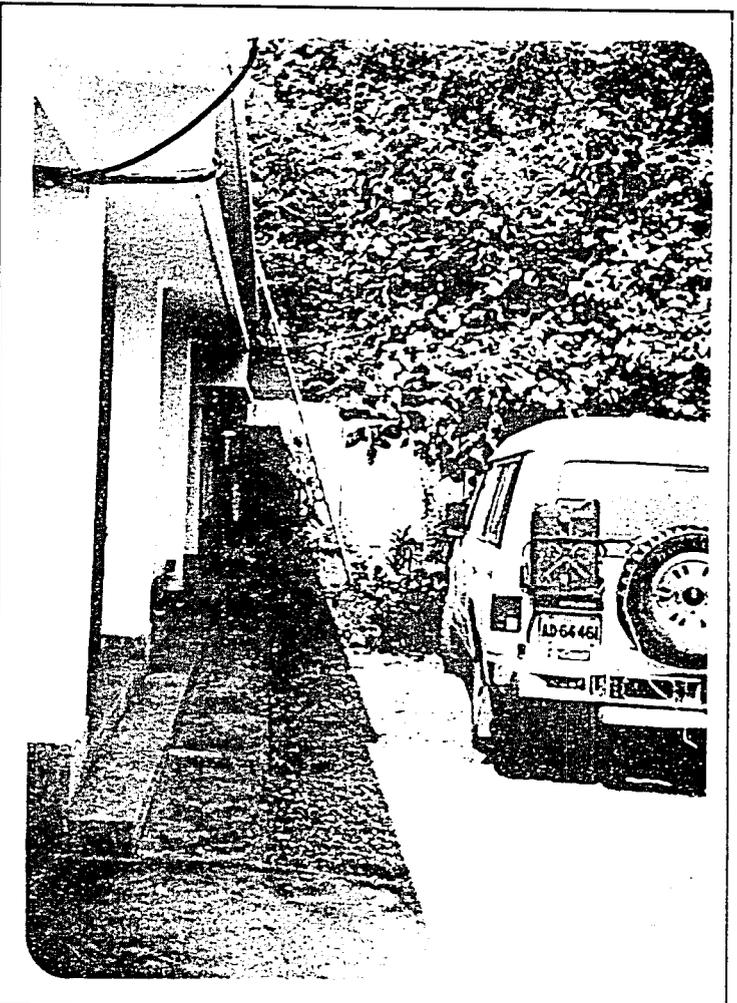


Figure 4 Peshawar VITA Office Facility. Partial view of front yard of facility.

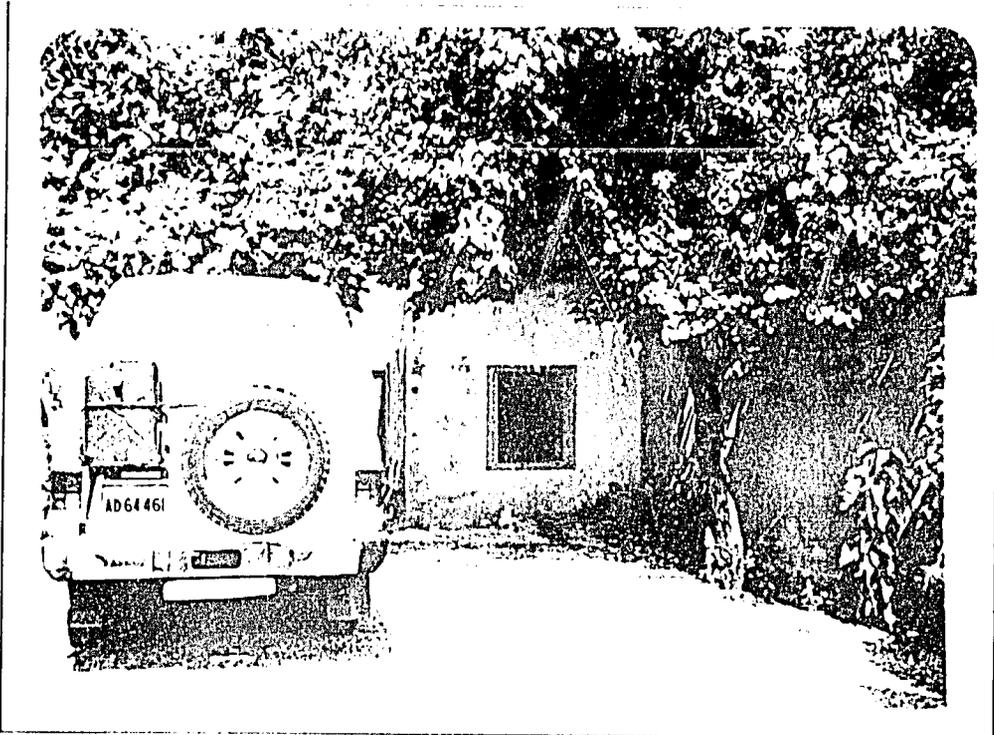


Figure 5 Peshawar VITA Office Facility. Partial view of front yard, including the emergency generator structure and front wall.

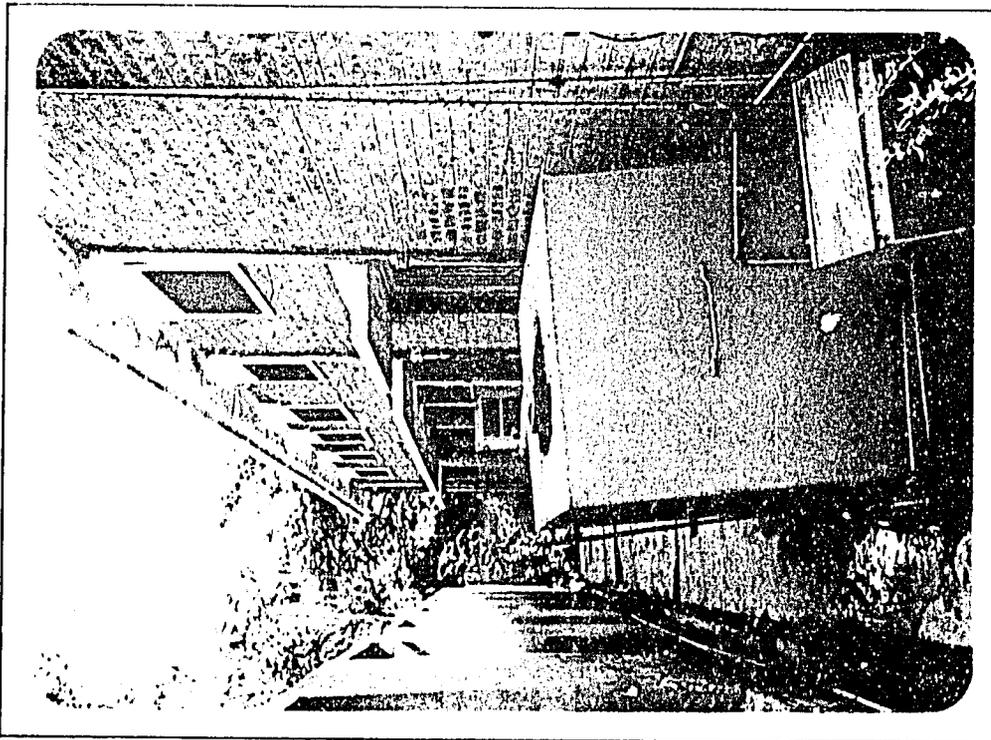


Figure 6 Peshawar VITA Office Facility. Rear view of facility.

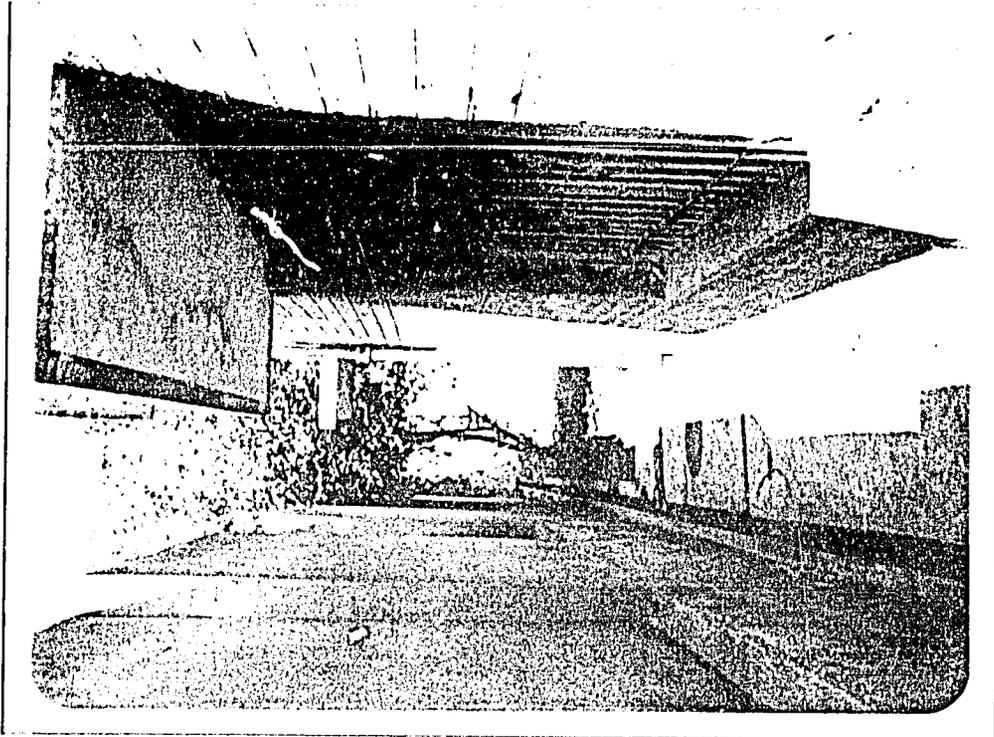


Figure 7 Peshawar VITA Office Facility. Right hand side of property viewed from rear of building.

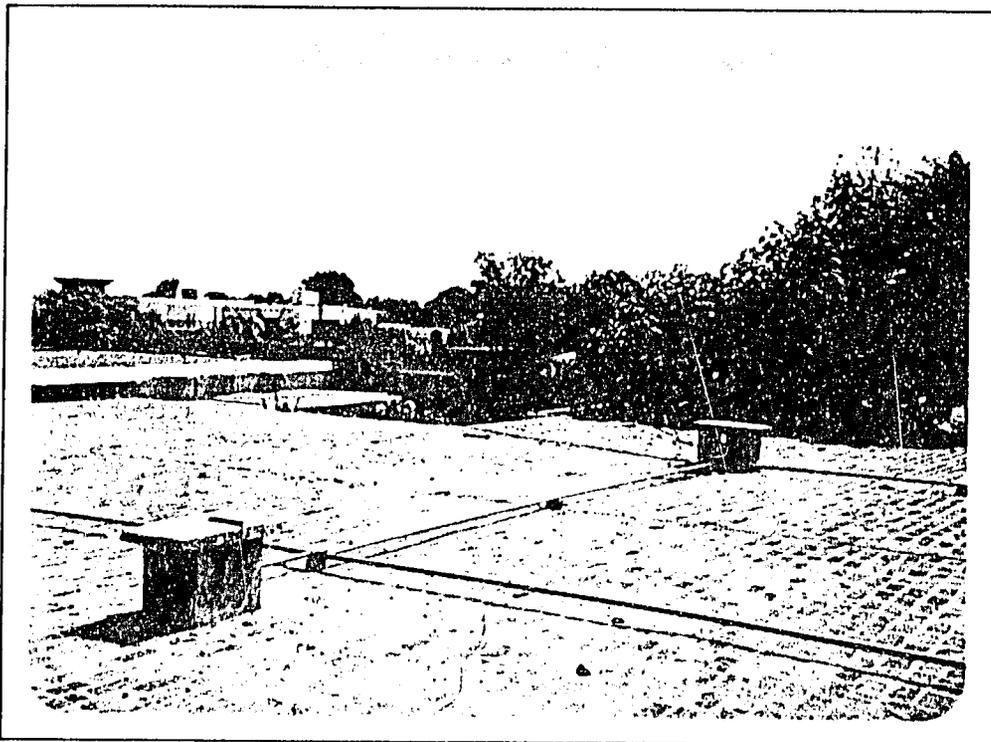
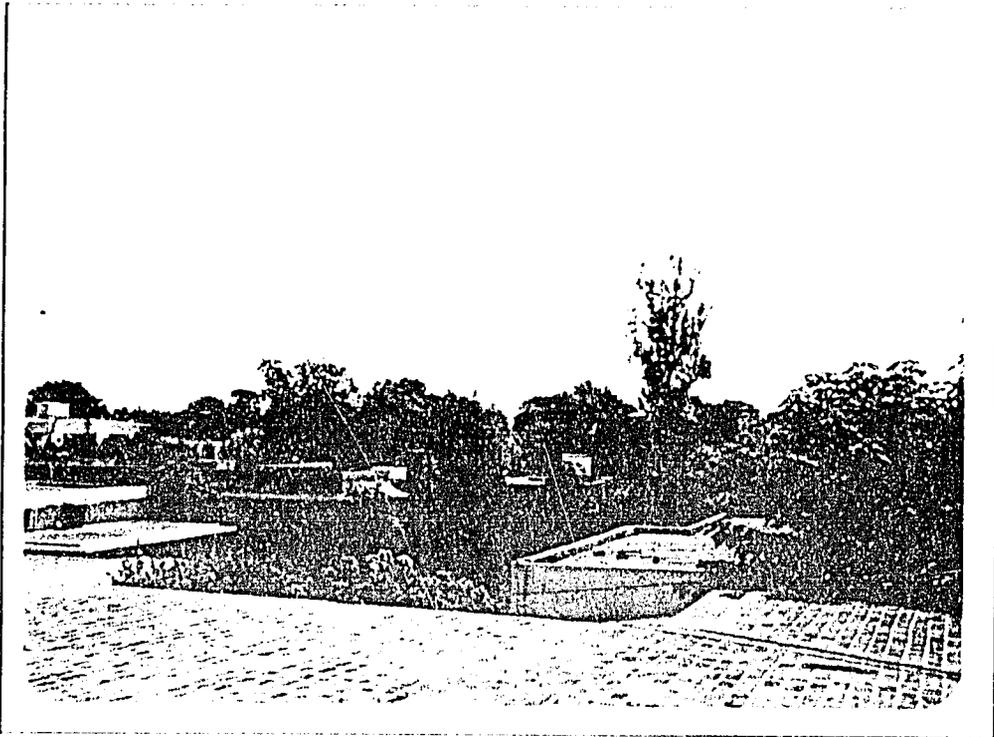
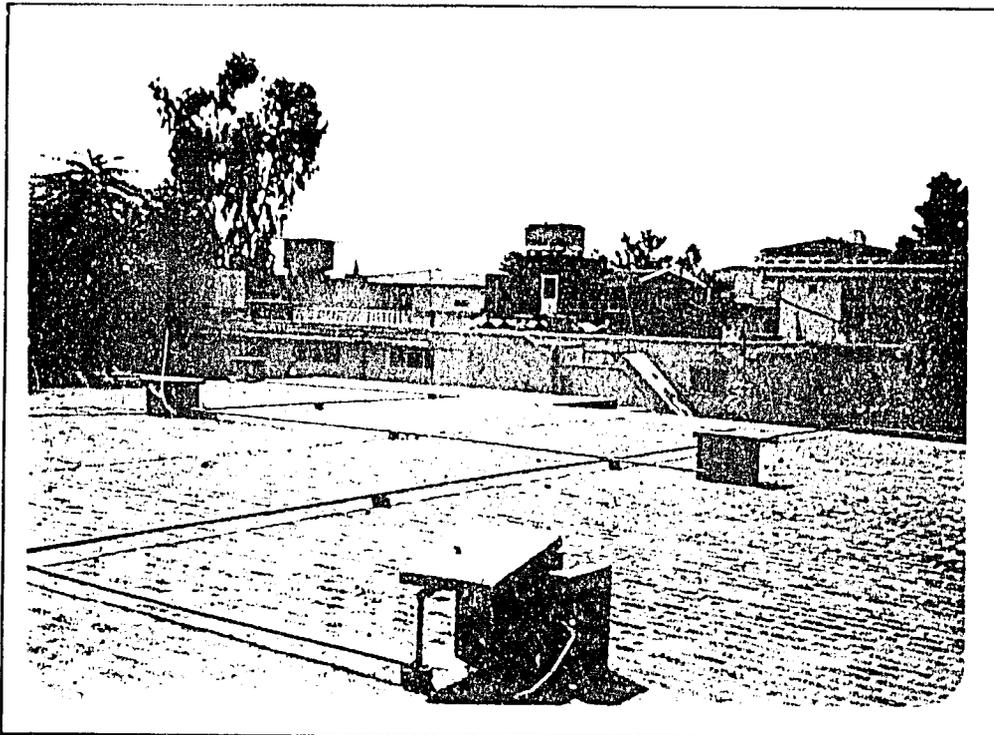


Figure 8 Peshawar VITA Office Facility. Roof top view toward Pabbi.



**Figure 9** Peshawar VITA Office Facility. Closeup view of transmission path to Pabbi.



**Figure 10** Peshawar VITA Office Facility. Roof top view facing South. Chimney in center right of photo contains conduit to proposed equipment room.

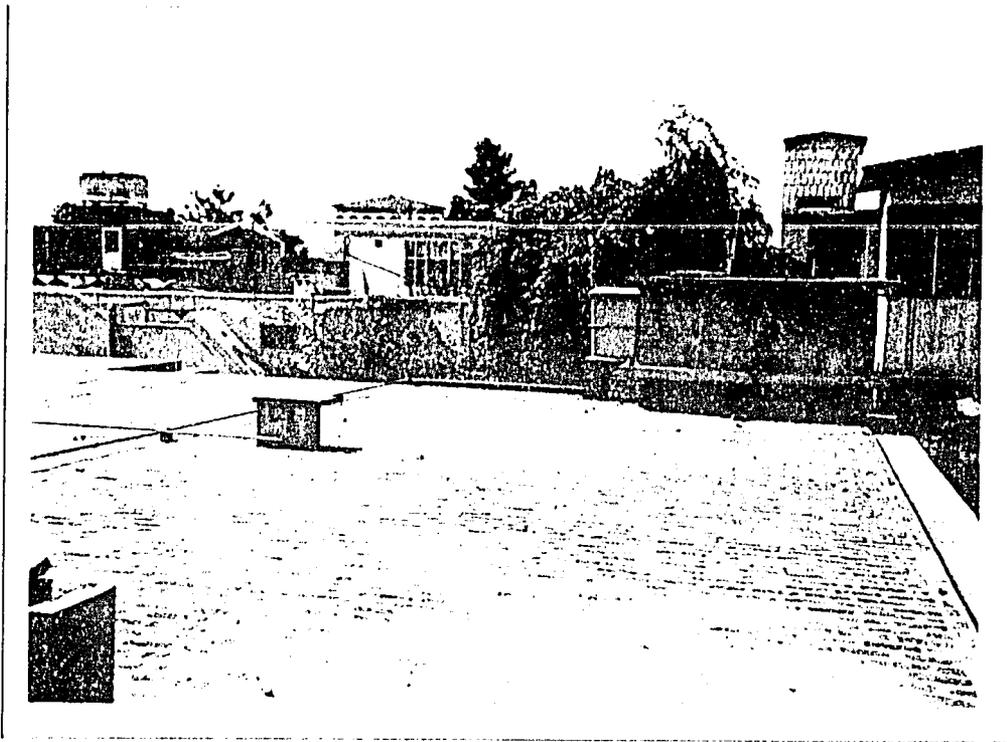


Figure 11 Peshawar VITA Office Facility. Roof top facing south. Chimney with conduit to equipment room center, left.

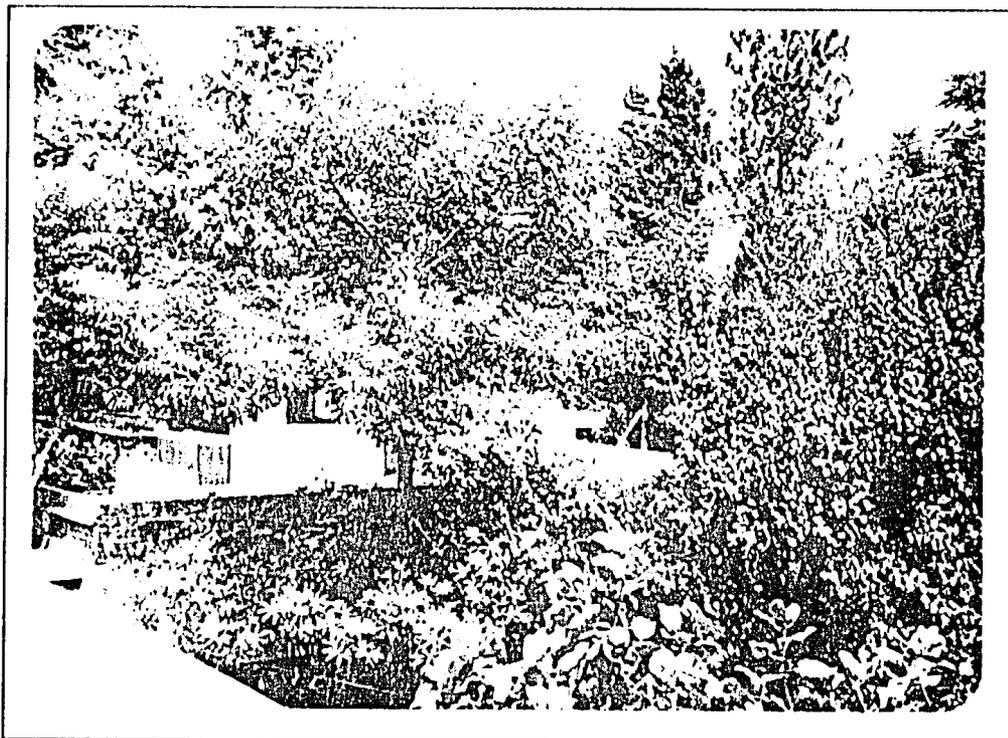


Figure 12 Peshawar VITA Office Facility. Shubbery and trees in front yard of facility.

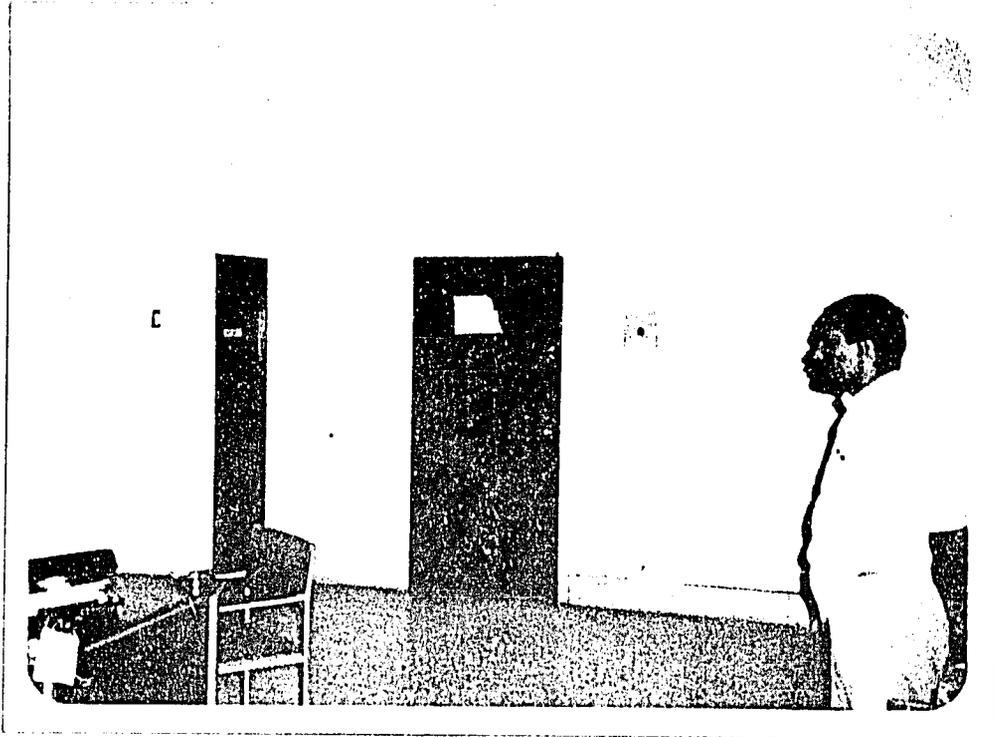


Figure 13 Peshawar VITA Office Facility. Proposed equipment room location.

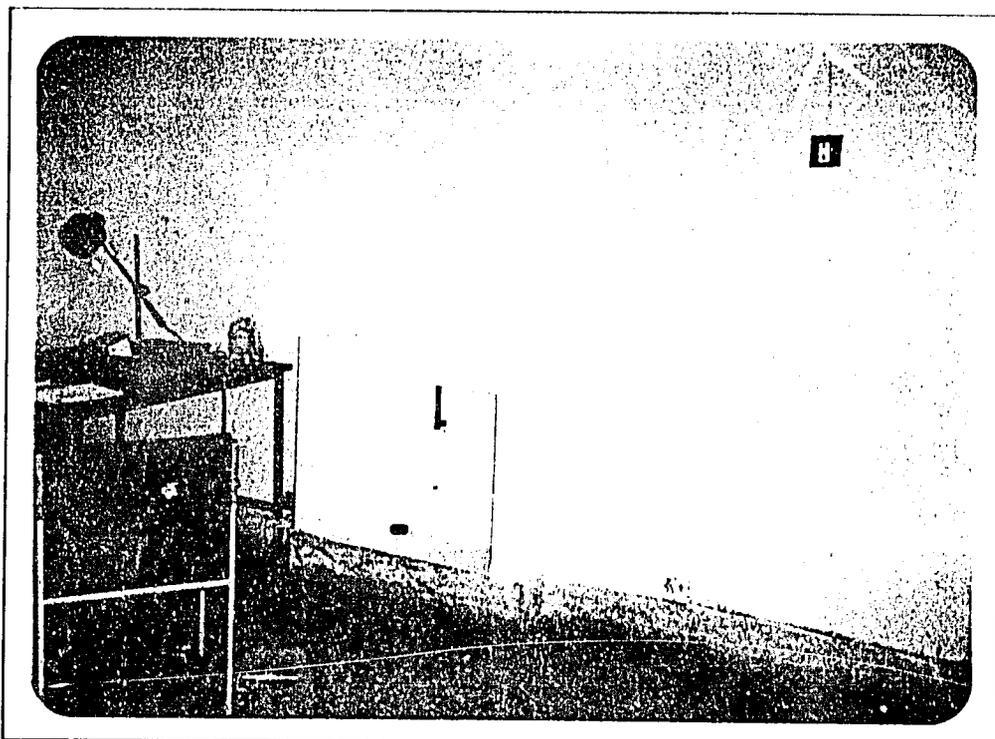
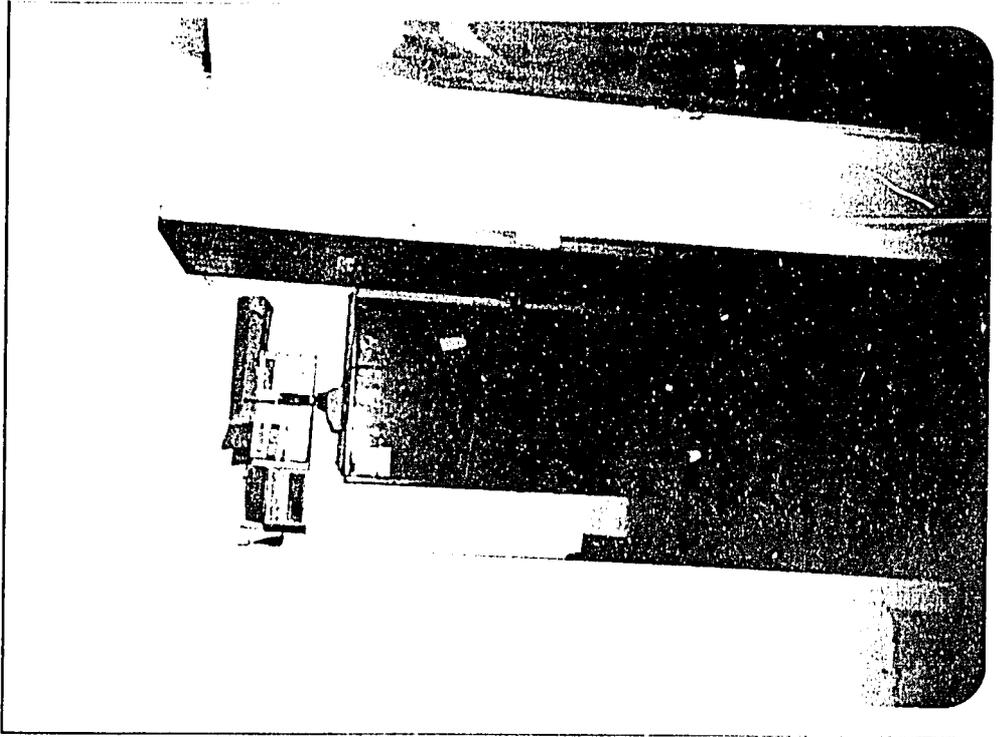
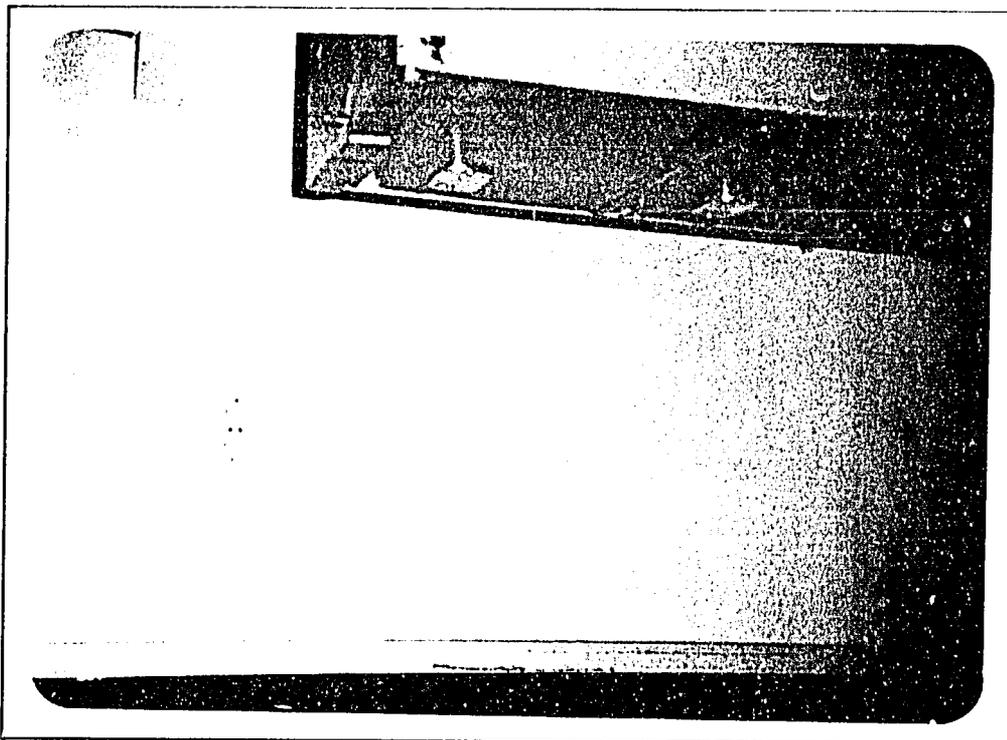


Figure 14 Peshawar VITA Office Facility. BSAA equipment to be located adjacent to fireplace. AC outlet to be used for BSAA charger.



**Figure 15** Peshawar VITA Office Facility. Alternate charger location inside closet adjacent to BSAA equipment location. See Figure 13 for reference.



**Figure 16** Peshawar VITA Office Facility. Alternate location for charger inside storage room.

Site Photographs

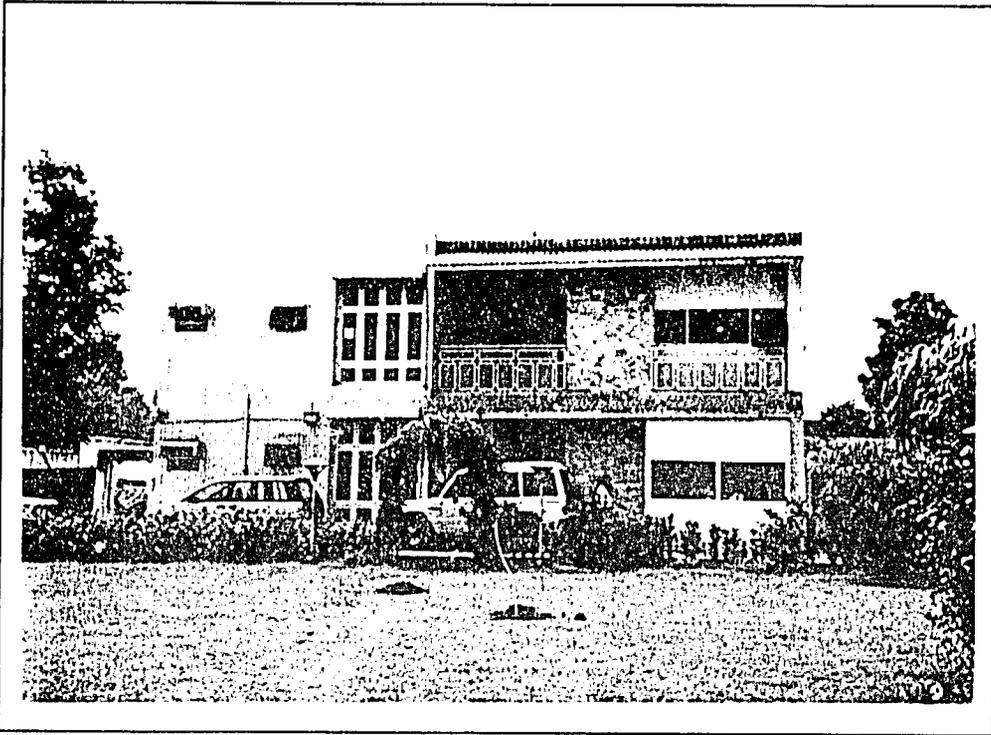


Figure 1 Peshawar MSH Office Facility. Front View.

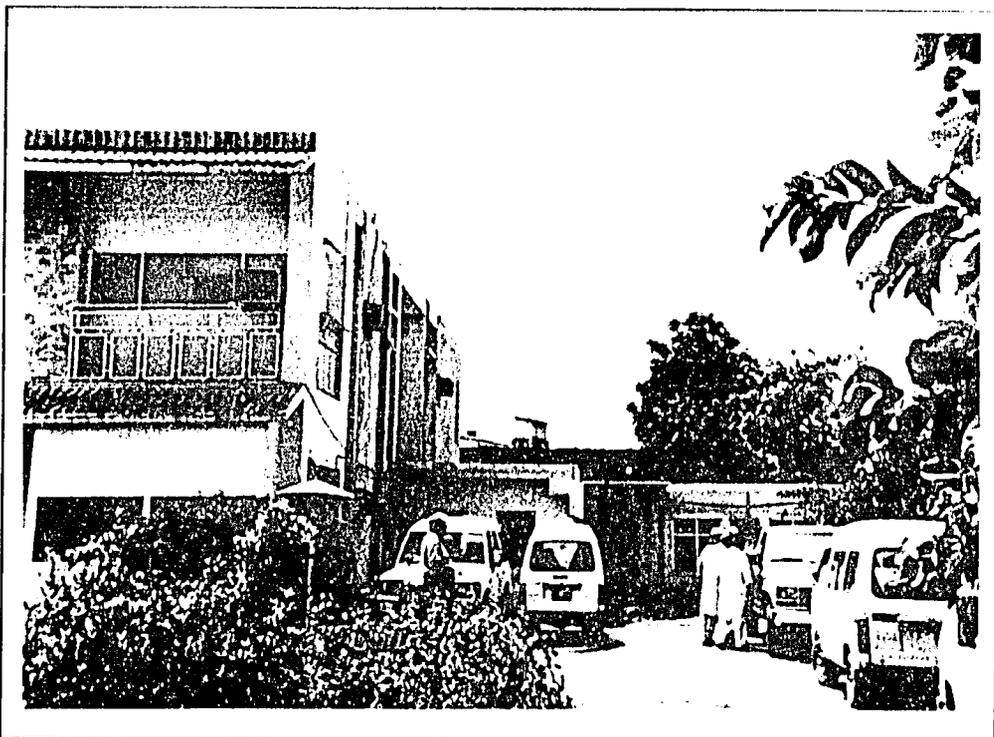


Figure 2 Peshawar MSH Office Facility. Closeup Field Operations offices lower right.

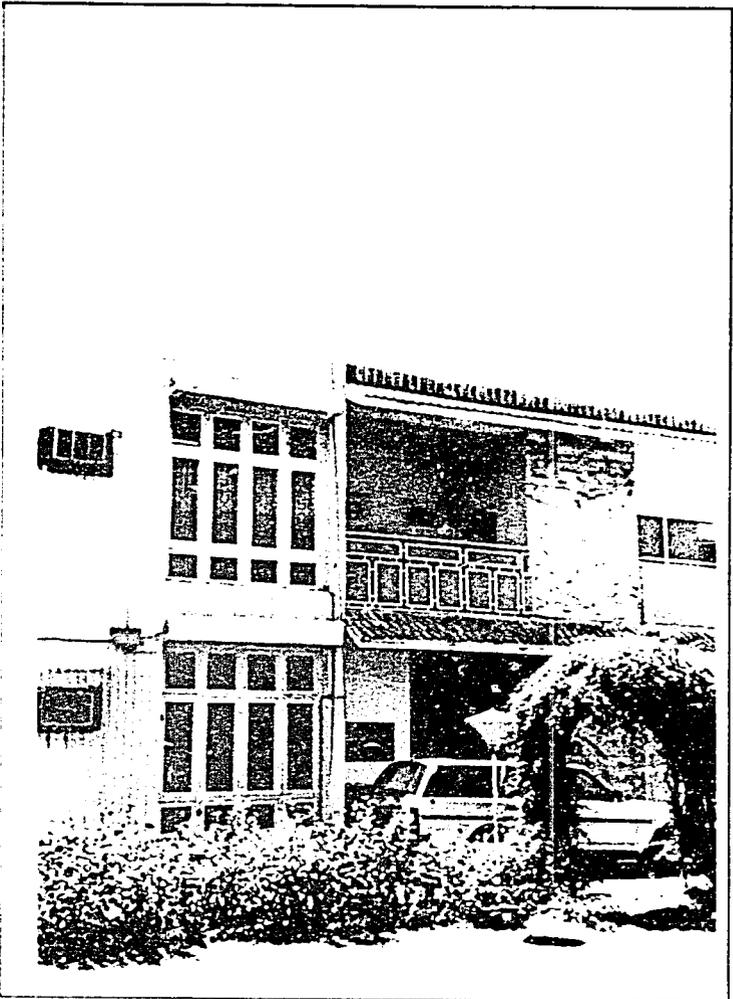


Figure 3 Peshawar MSH Office Facility. COP's office lower left window.

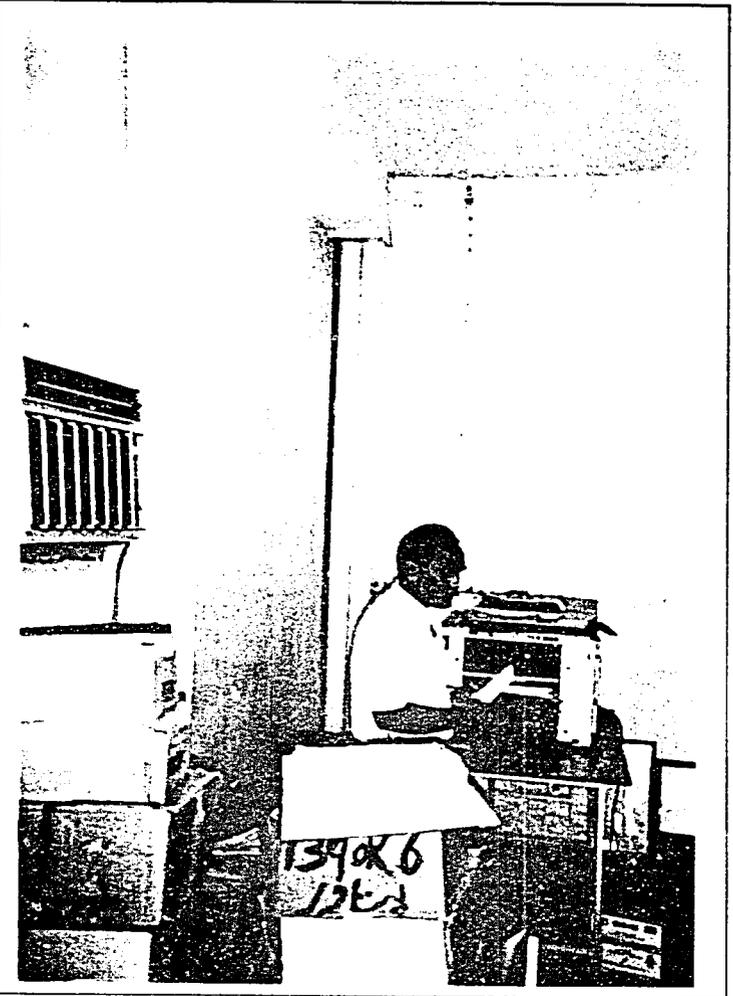


Figure 4 Peshawar MSH Office Facility. Proposed location of BSAA equipment between pipes on left side.



Figure 5 Peshawar MSH Office Facility. Proposed BSAA equipment room. View from proposed equipment location.

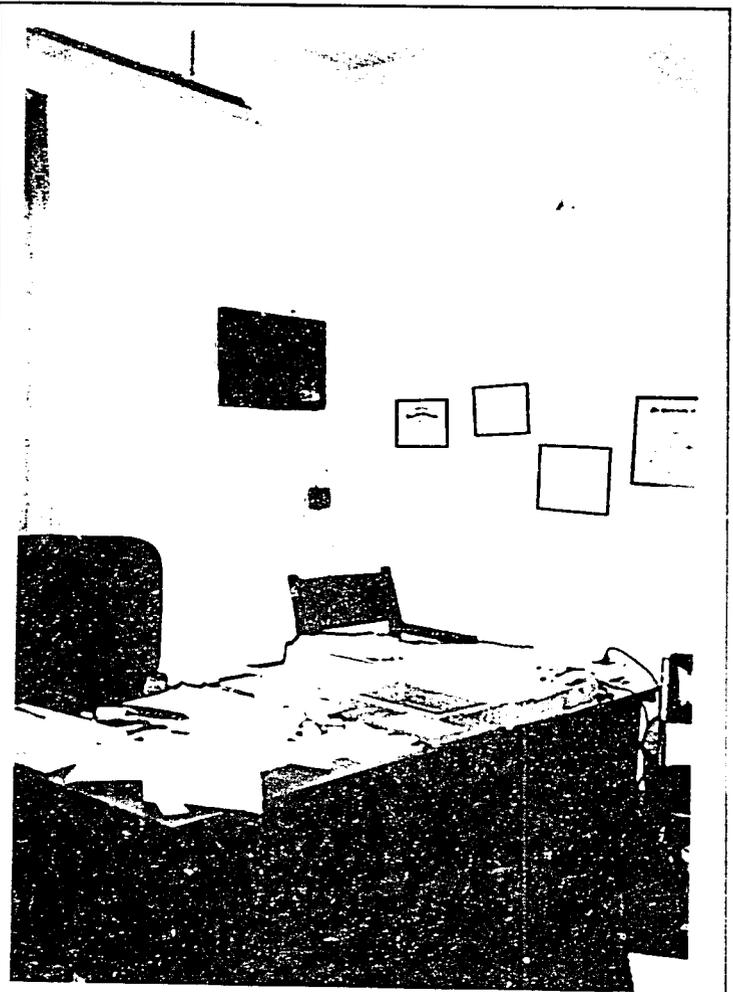


Figure 6 Peshawar MSH Office Facility. COP Office. Location for BSAA Phone No. 1 on low desk, against wall.

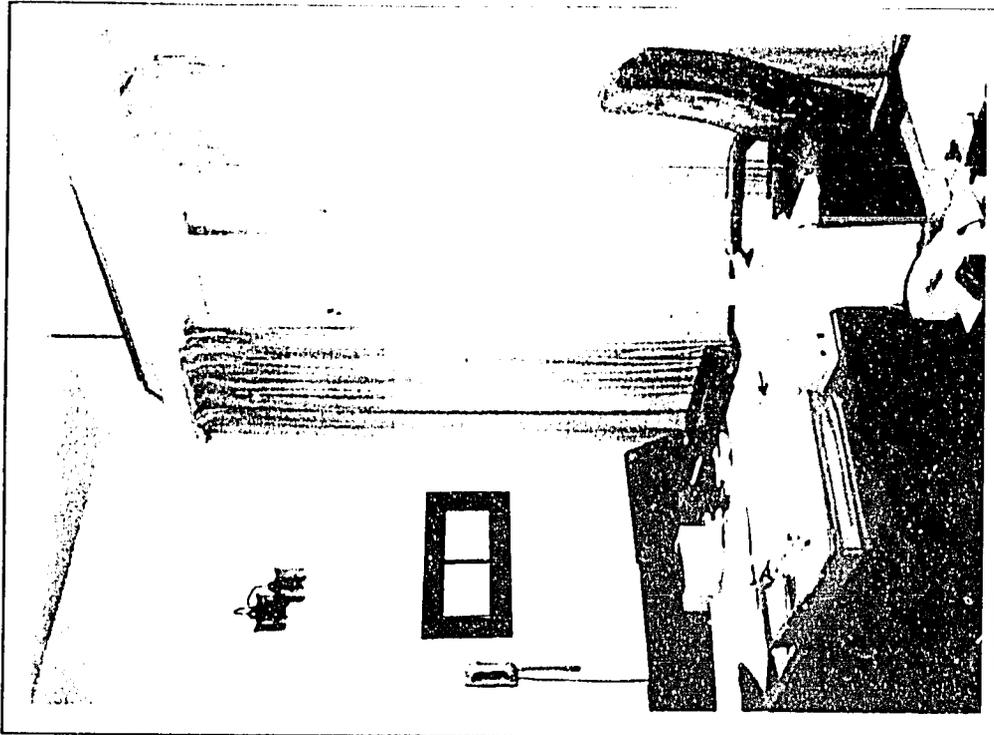


Figure 7 Peshawar MSH Office Facility. COP's Office (left side). Interface cable entry to be through window frame, down along wall to right side of office.

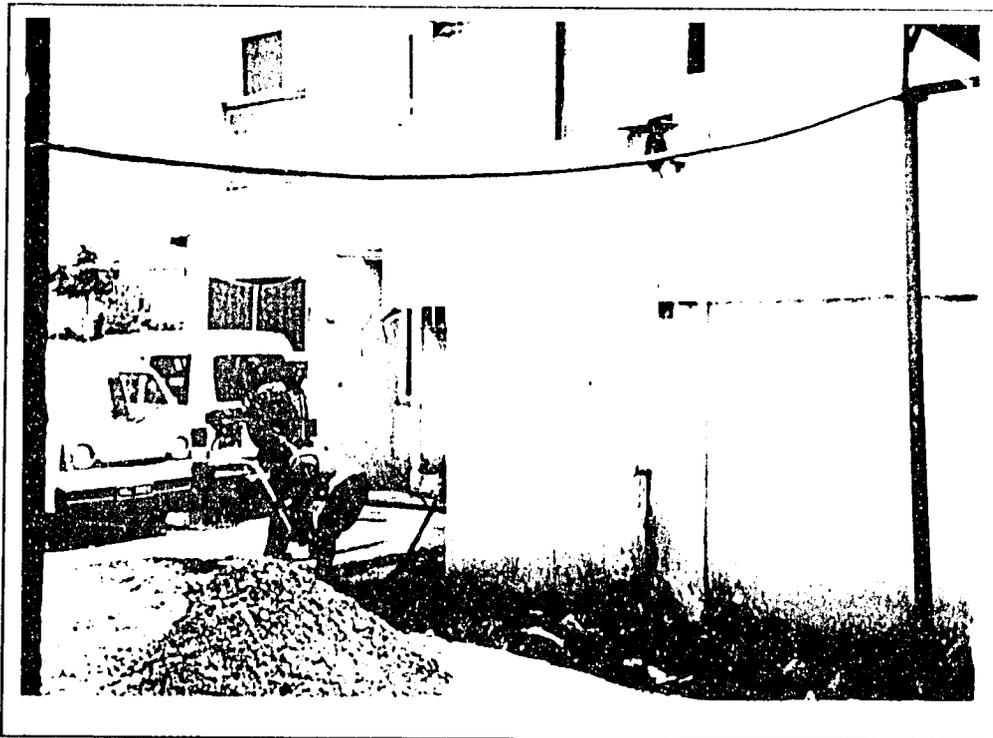


Figure 8 Peshawar MSH Office Facility. West side of building for reference.

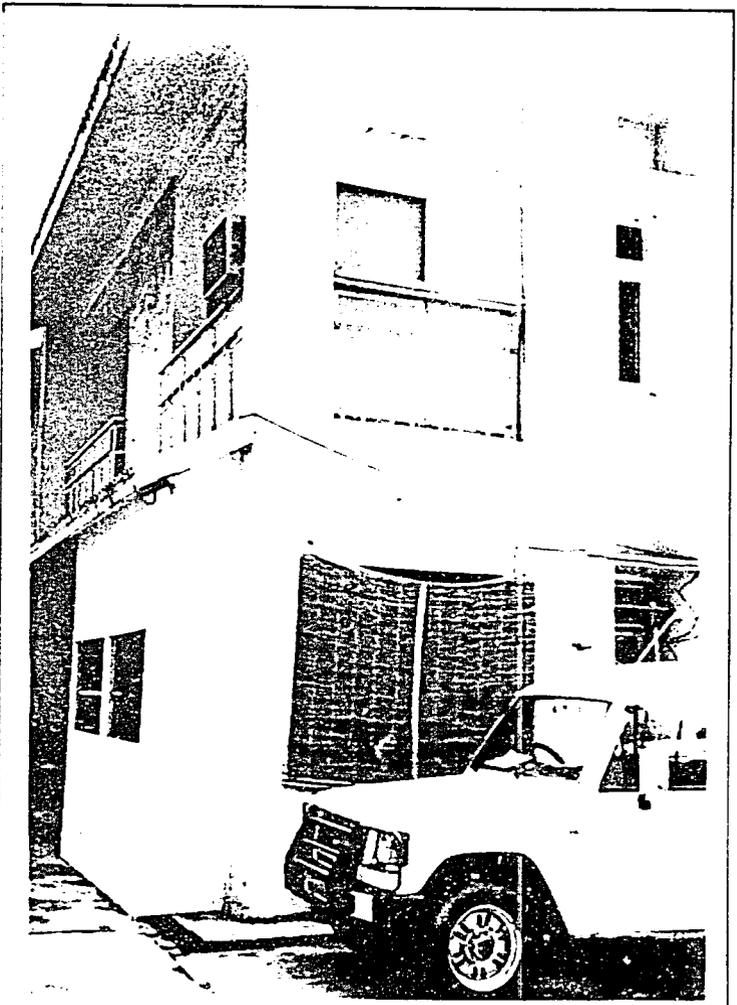


Figure 9 Peshawar MSH Office Facility. Northwest corner of building.

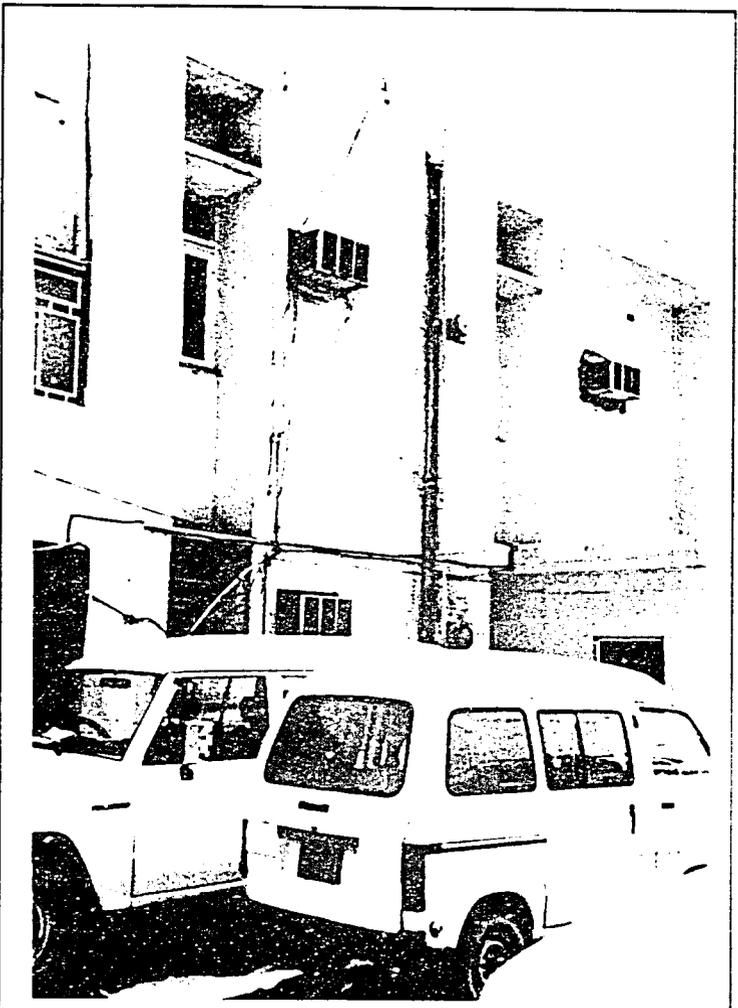


Figure 10 Peshawar MSH Office Facility. West side of building.

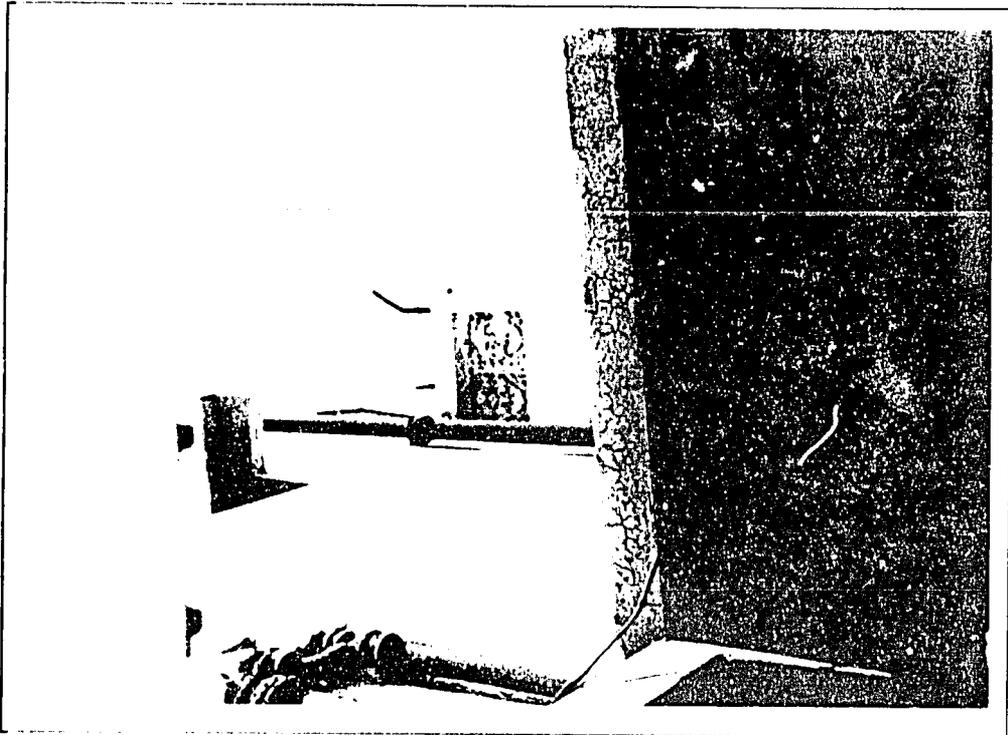


Figure 11 Peshawar MSH Office Facility. Rear or southern section of building. Phone No. 2 cable to be run to drain pipe (center) to drain pipe on left.

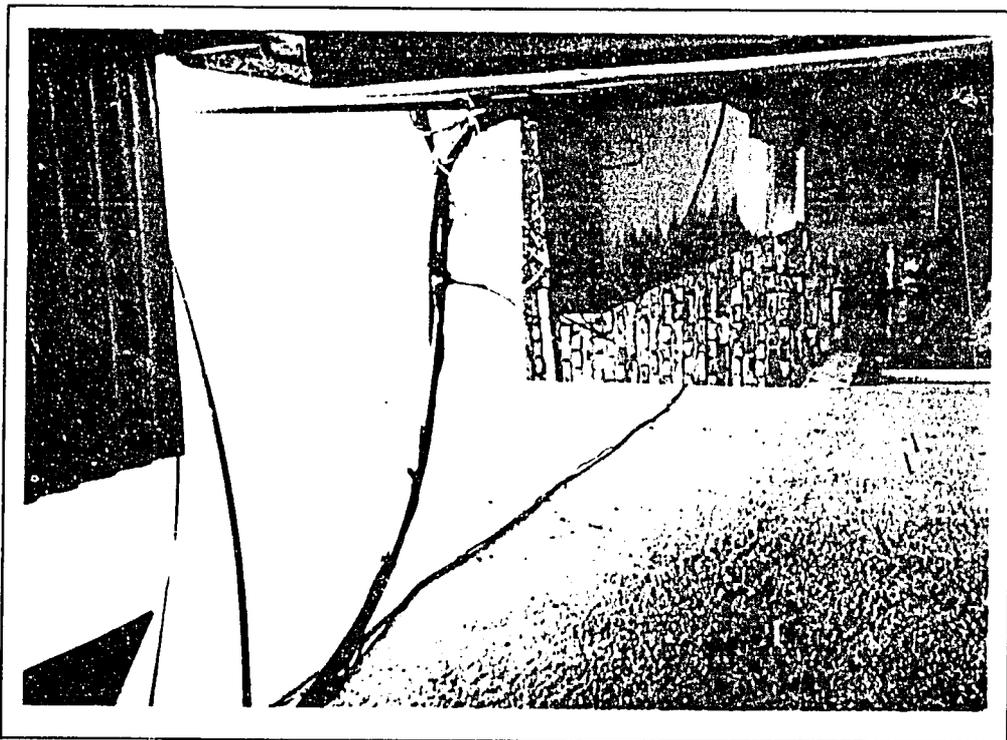


Figure 12 Peshawar MSH Office Facility. Southwest corner. Cable crossover to Field Operations building.

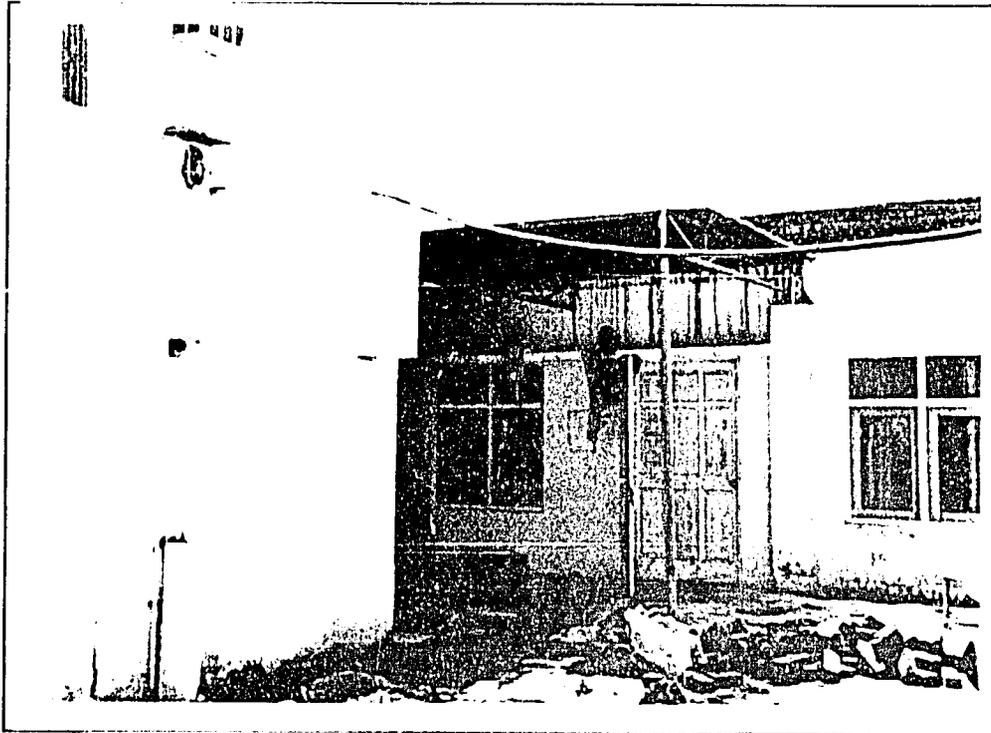


Figure 13 Peshawar MSH Office Facility. Field Operations office, left side. Cable to be run under roof support girder to window.

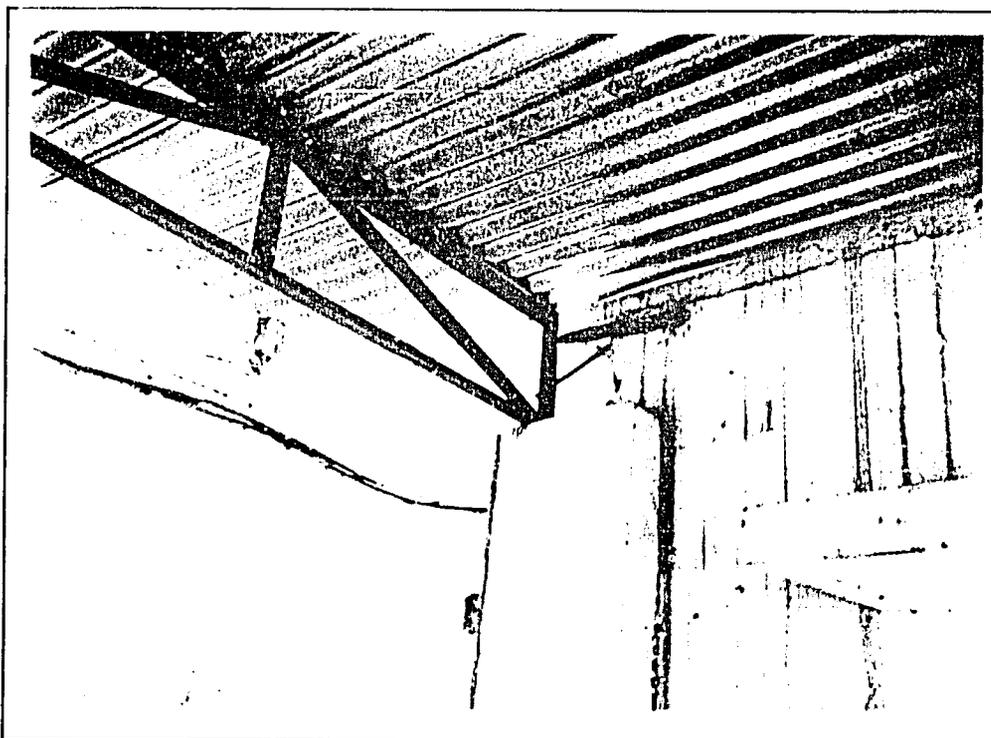


Figure 14 Peshawar MSH Office Facility. Detail of roof support girder at Field Operations building.

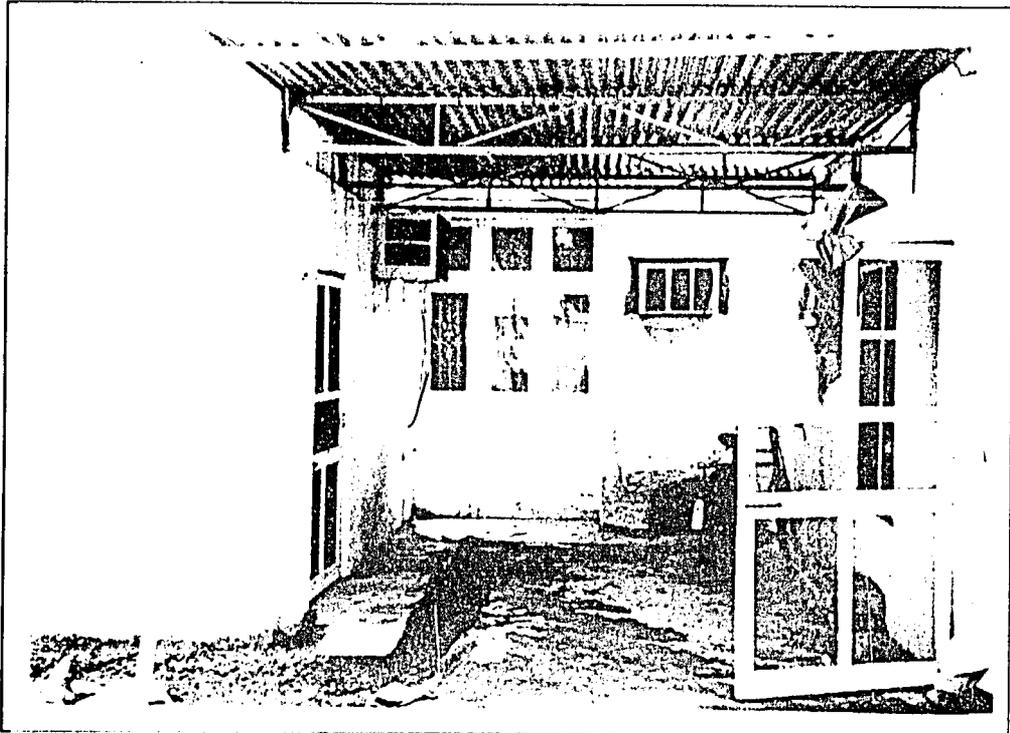


Figure 15 Peshawar MSH Office Facility. View of corridor between Main Building and Field Operations office on right.

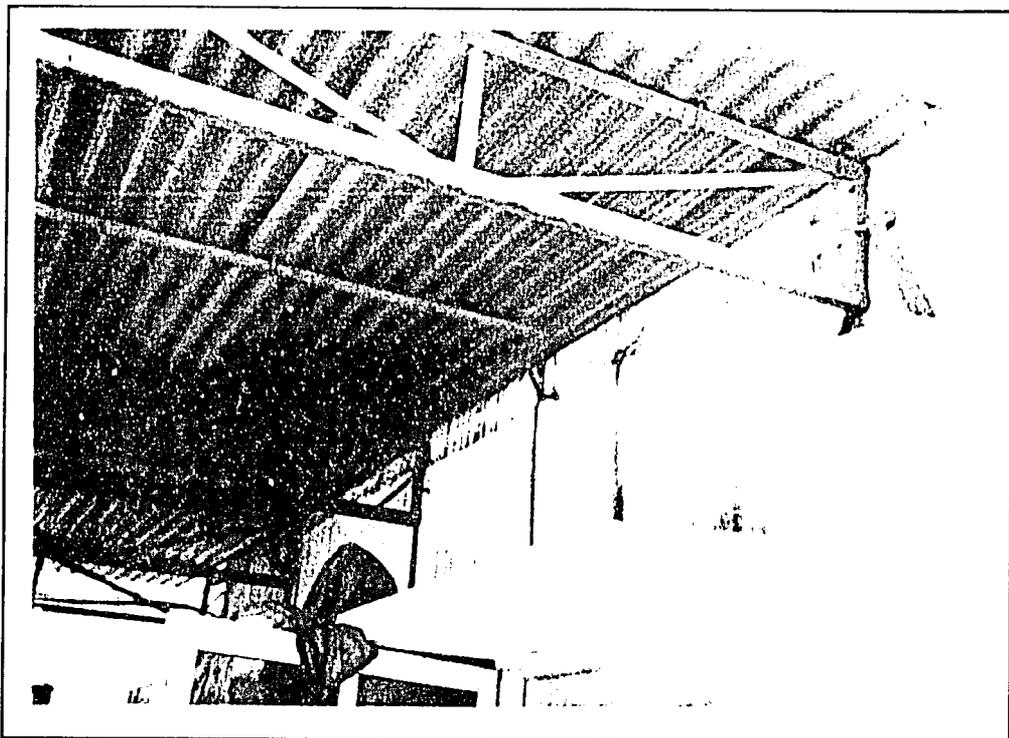


Figure 16 Peshawar MSH Office Facility. Detail of roof support adjacent to Field Operations office.

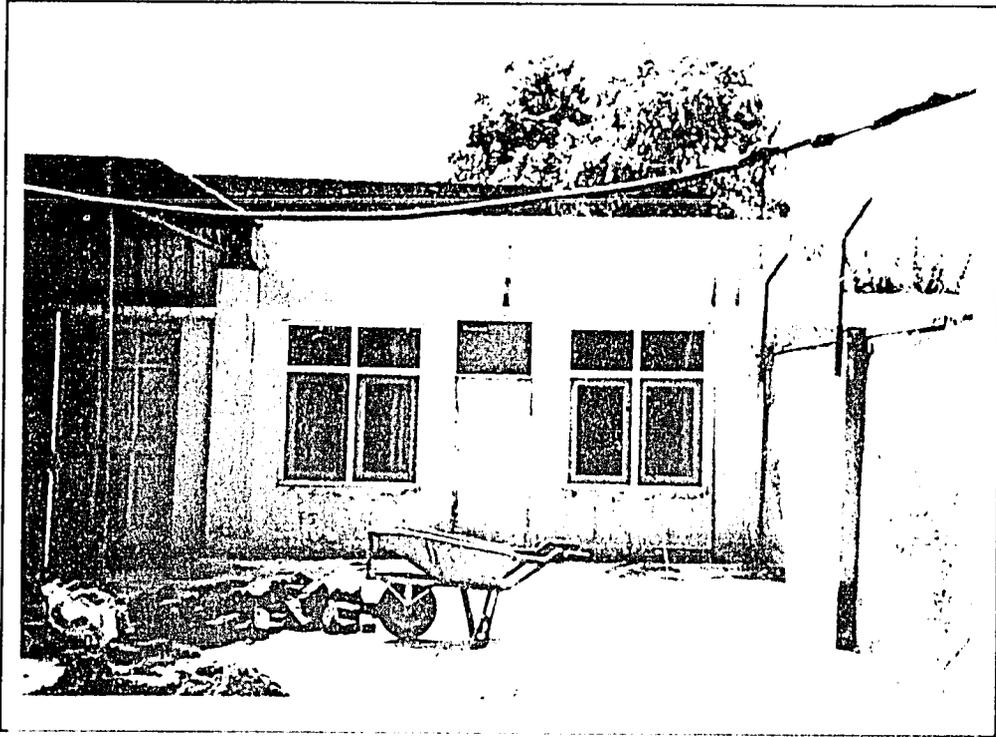


Figure 17 Peshawar MSH Office Facility. Field Operations office.



Figure 18 Peshawar MSH Office Facility. Interior of Field Operations office. Run cable through window frame, down wall along floor to desk.

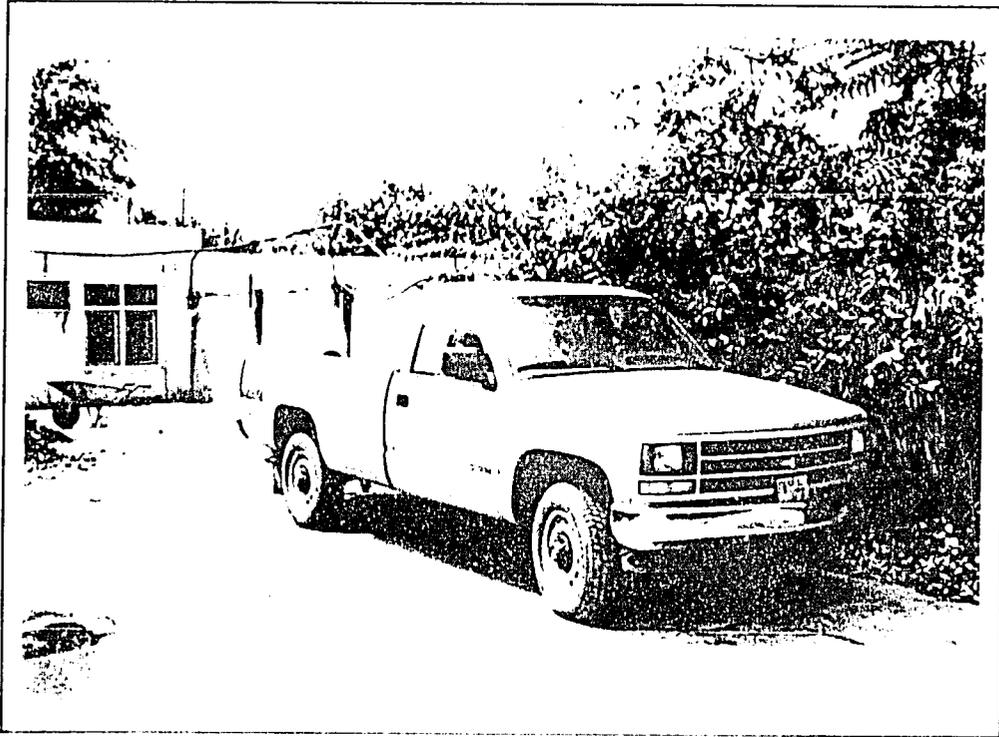


Figure 19 Peshawar MSH Office Facility. New Chevy Pickup Truck.

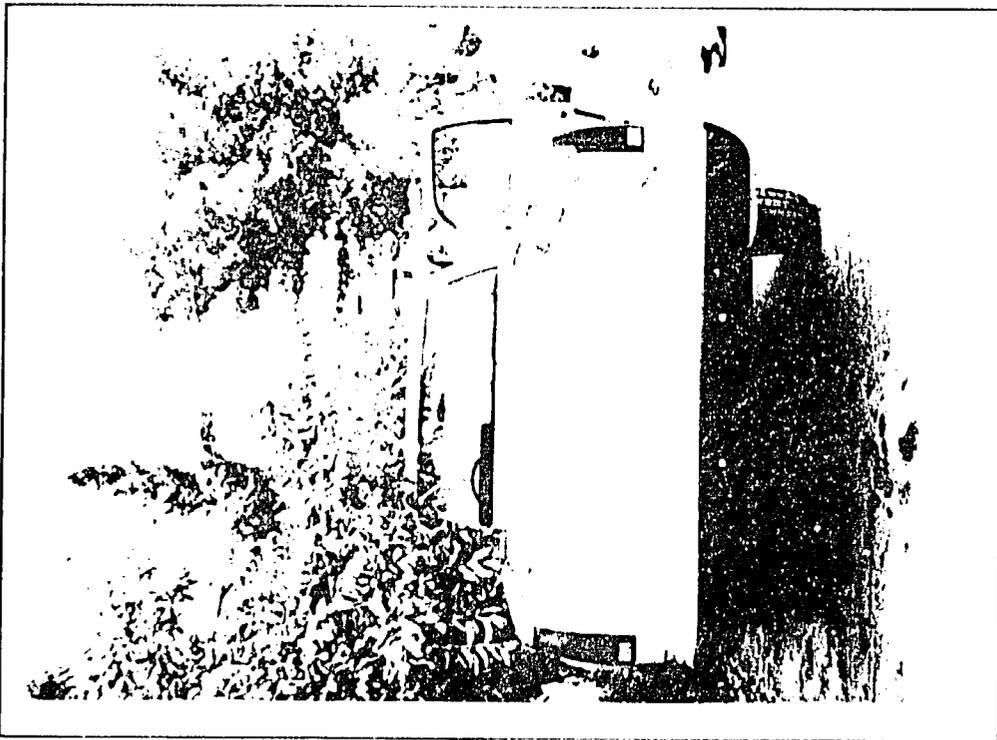


Figure 20 Peshawar MSH Office Facility. Rear bed of Chevy pickup.



Figure 21 Peshawar MSH Office Facility. Chevy pickup truck interior space behind seats.

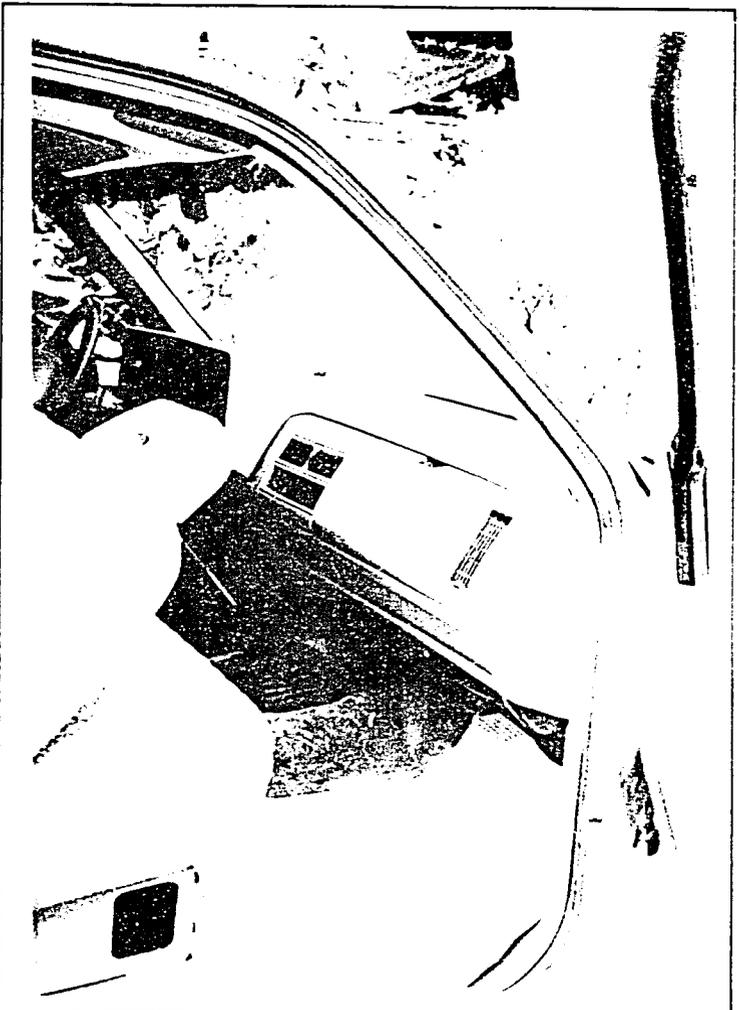


Figure 22 Peshawar MSH Office Facility. Interior view of Chevy pickup passenger side.

Site Photographs

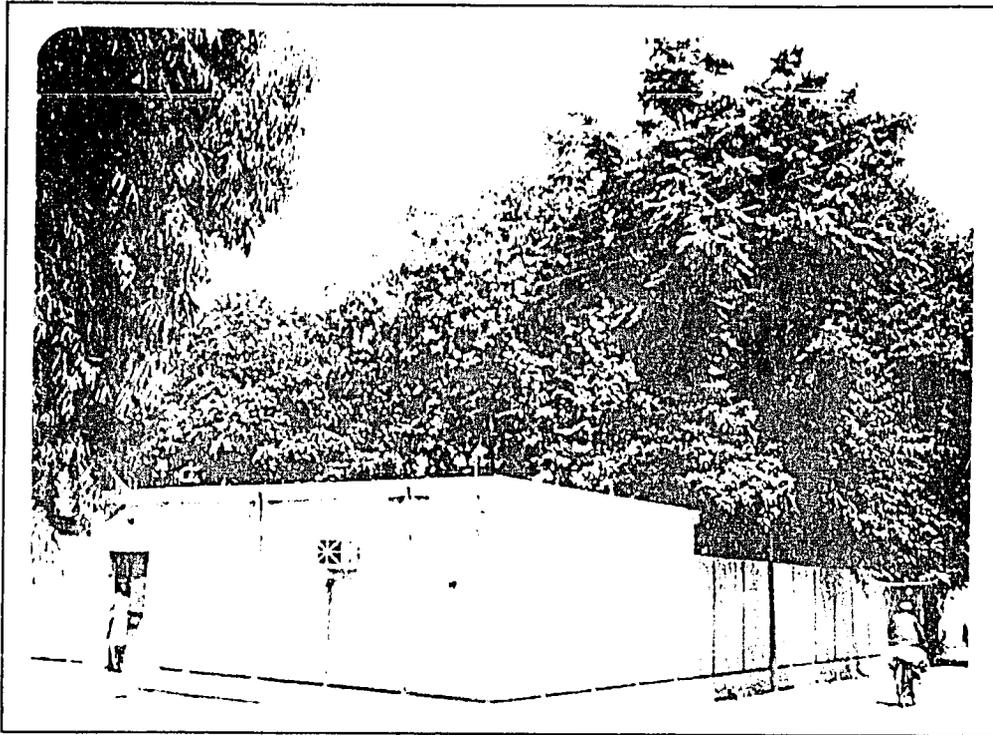


Figure 1 Peshawar IRC Office Facility. View of office complex from street. Entrance on lower left.

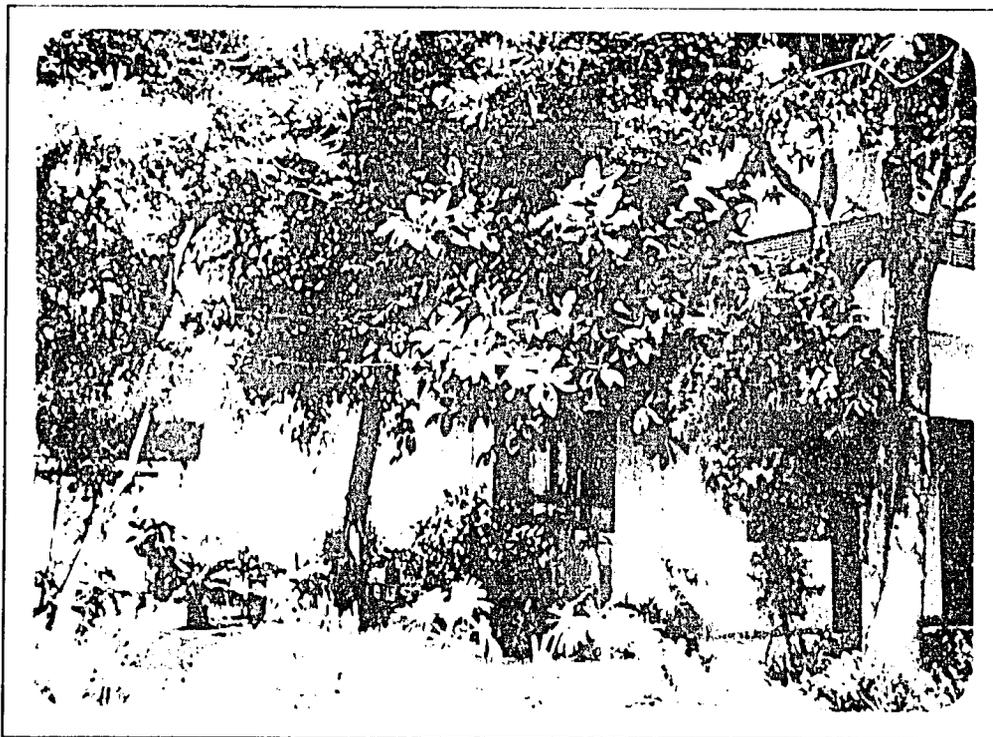


Figure 2 Peshawar IRC Office Facility. West side of building.

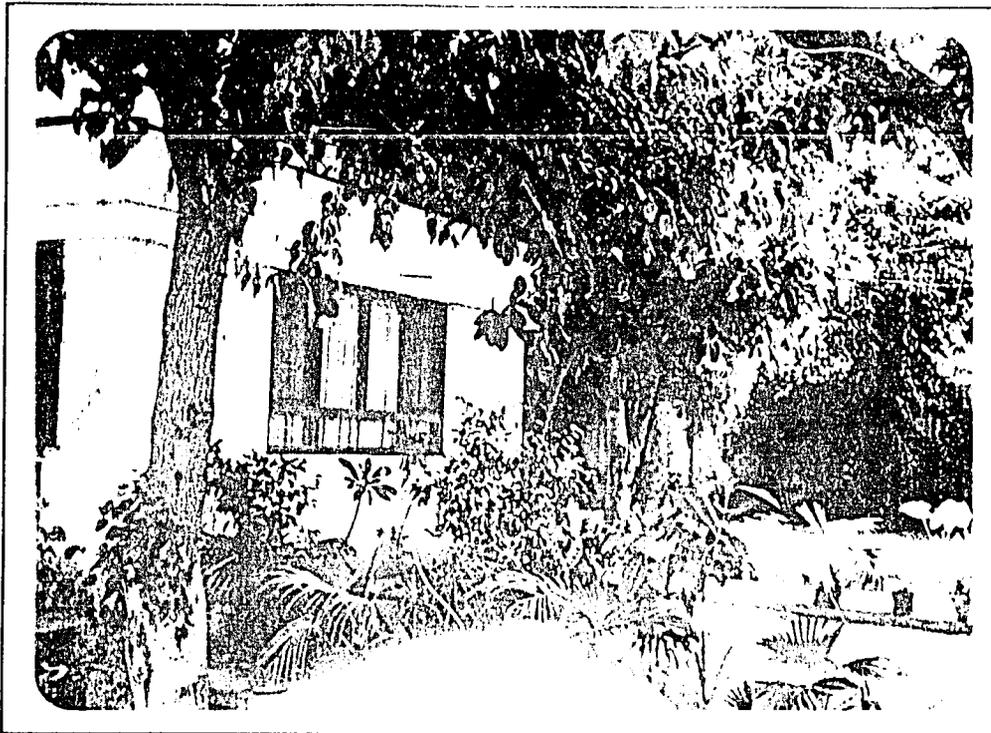


Figure 3 Peshawar IRC Office Facility. West side of building (alternate view).

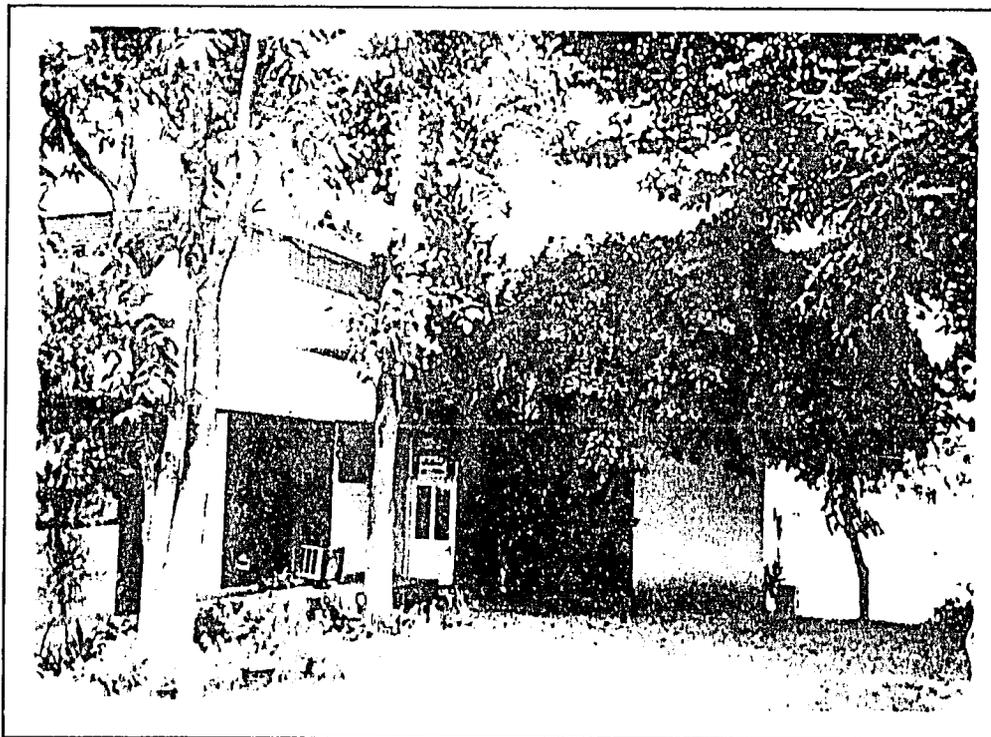
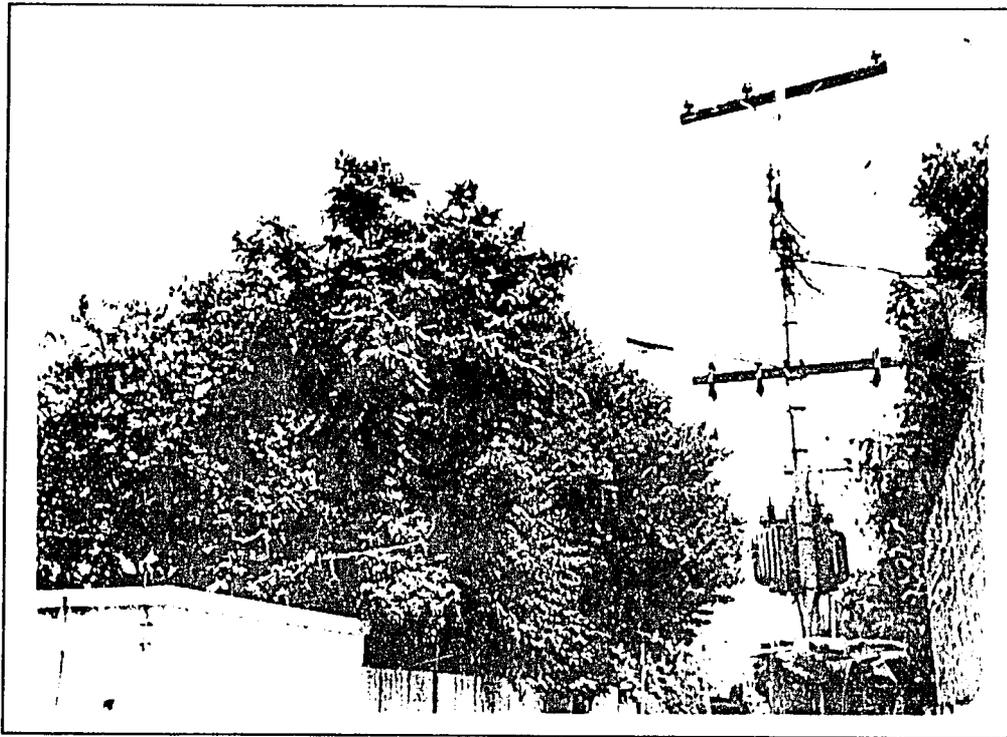
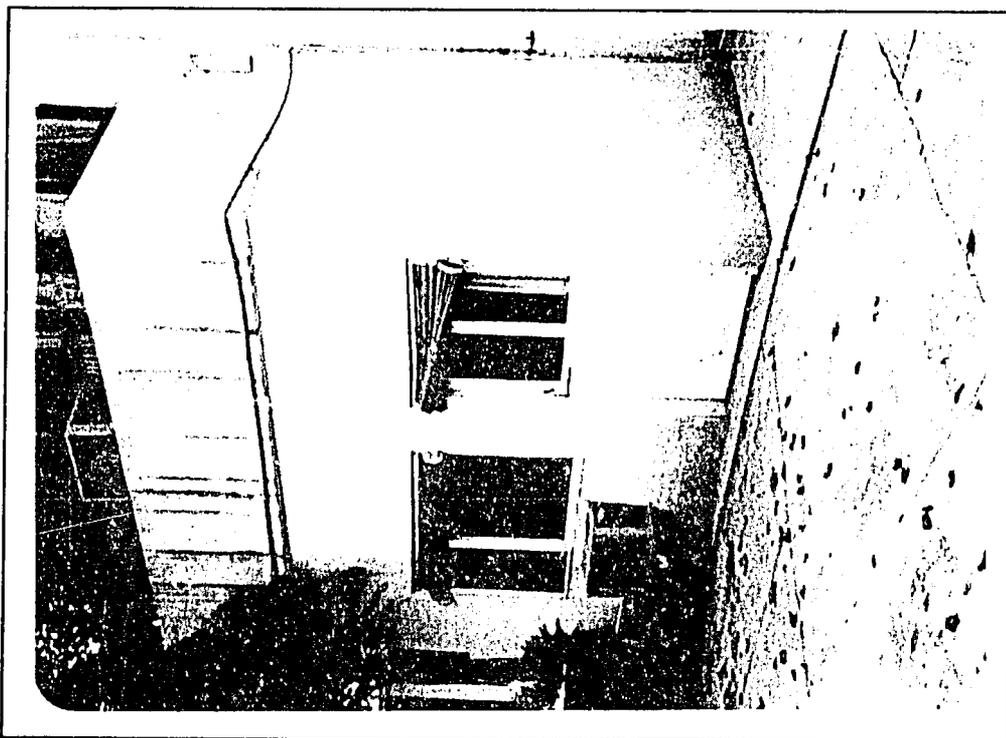


Figure 4 Peshawar IRC Office Facility. Building entrance (center).



**Figure 5** Peshawar IRC Office Facility. South wall and trees (reference).



**Figure 6** Peshawar IRC Office Facility. North wall of reception room location of the BSAA equipment. Equipment located inside corner of window on left side.

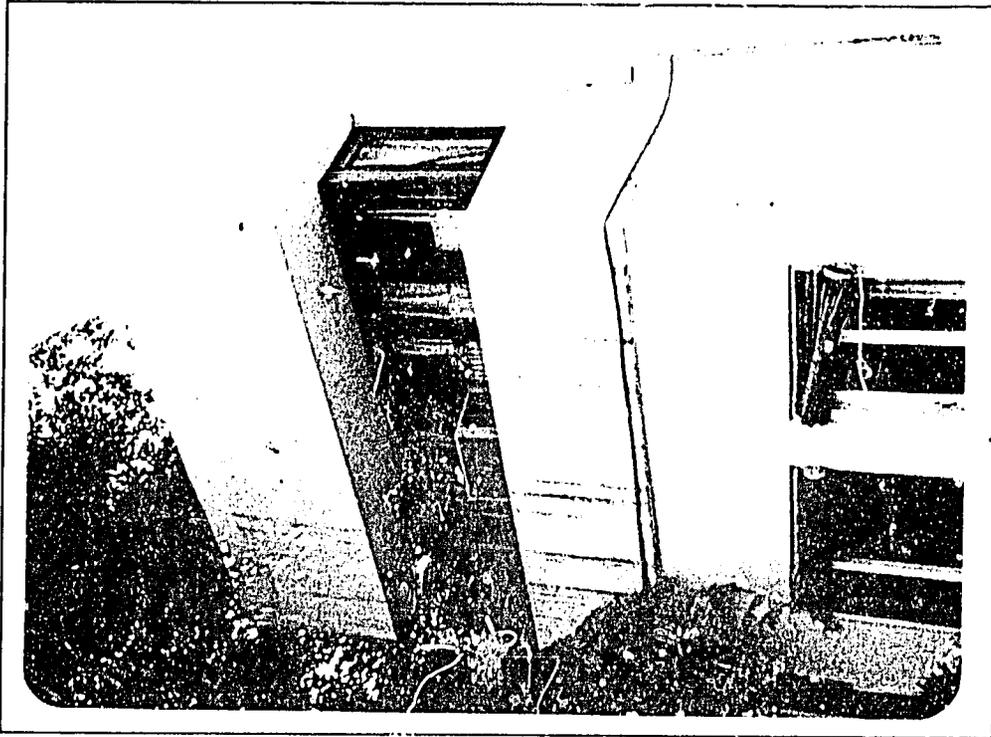


Figure 7 Peshawar IRC Office Facility. Upper section of building above proposed equipment location.

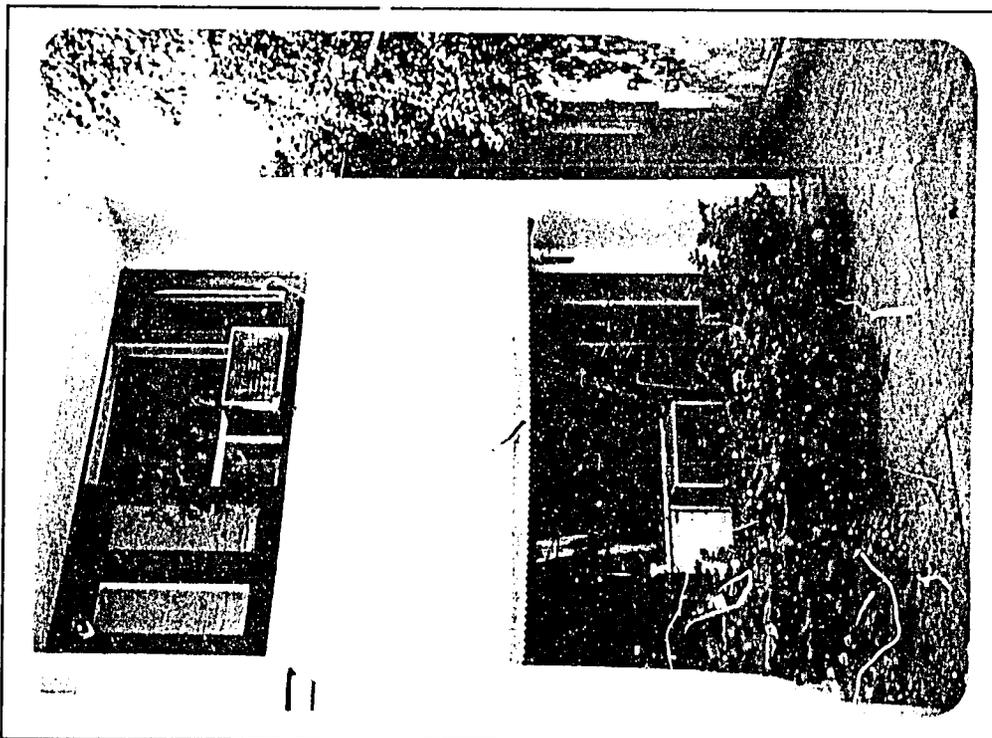


Figure 8 Peshawar IRC Office Facility. Office locations for Phones 2 & 3. Cable to be run from BSAA to locations on the outside of building.

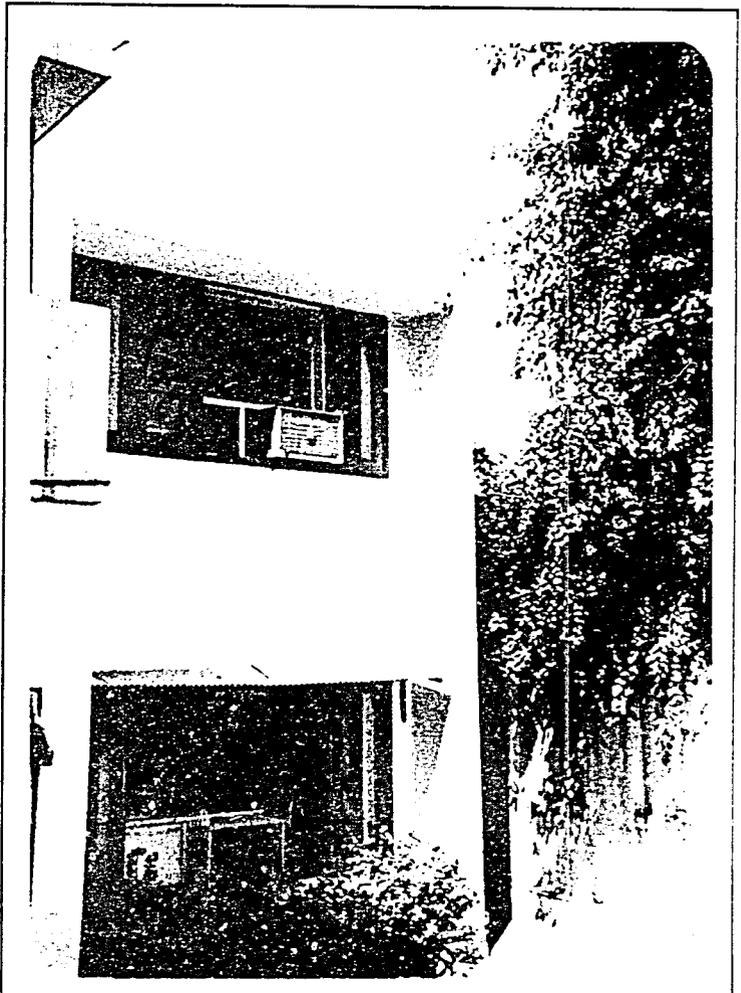


Figure 9 Peshawar IRC Office Facility. View of office locations for Phones 2 & 3.

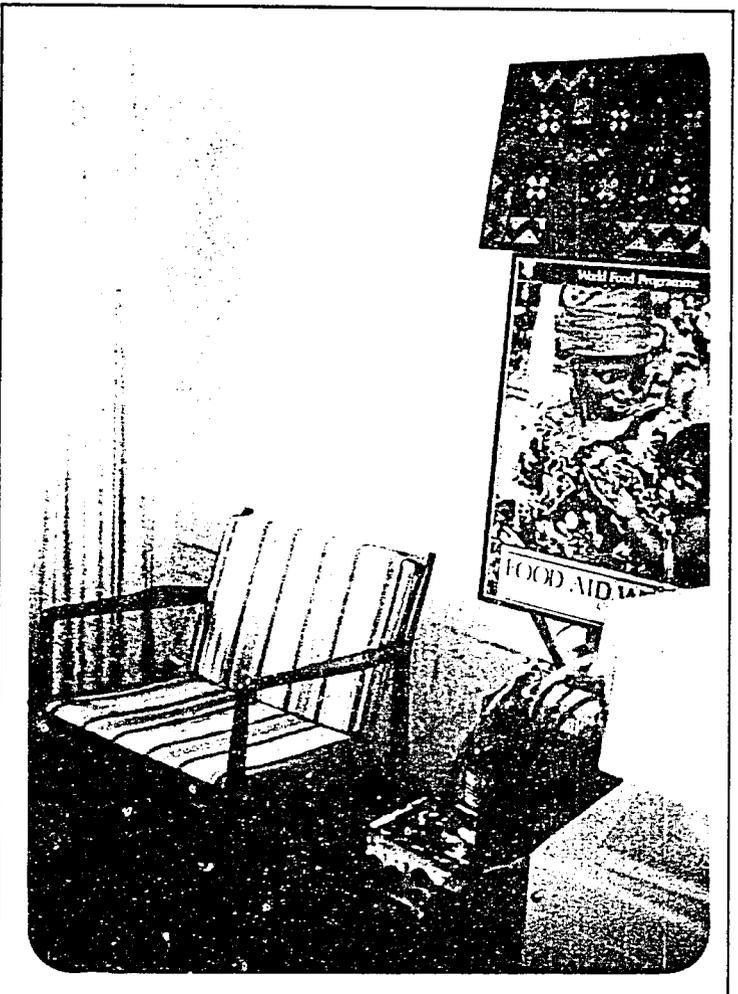


Figure 10 Peshawar IRC Office Facility. Reception area, proposed location for the BSAA equipment in corner.



Figure 11 Peshawar IRC Office Facility. Reception room left side. Door is located behind the curtain.



Figure 12 Peshawar IRC Office Facility. 1st floor office location of Phone No. 2. Cable entry through window frame.

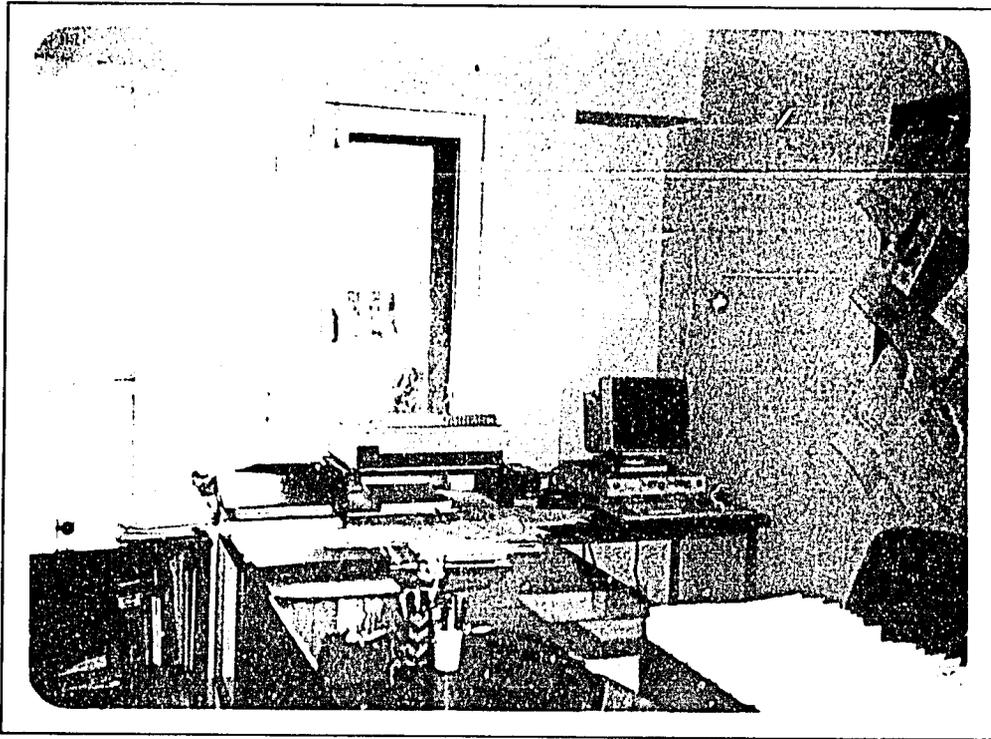


Figure 13 Peshawar IRC Office Facility. 2nd floor office location of Phone No.3. Cable entry through window frame, to floor, along wall to desk.

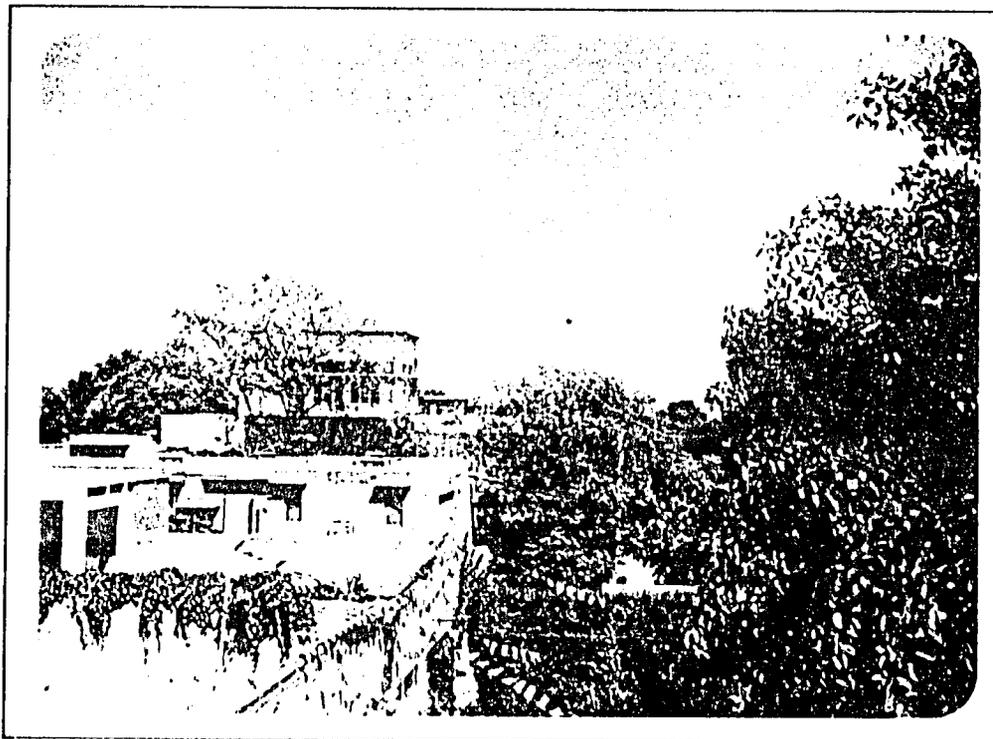


Figure 14 Peshawar IRC Office Facility. View toward Pabbi (East).

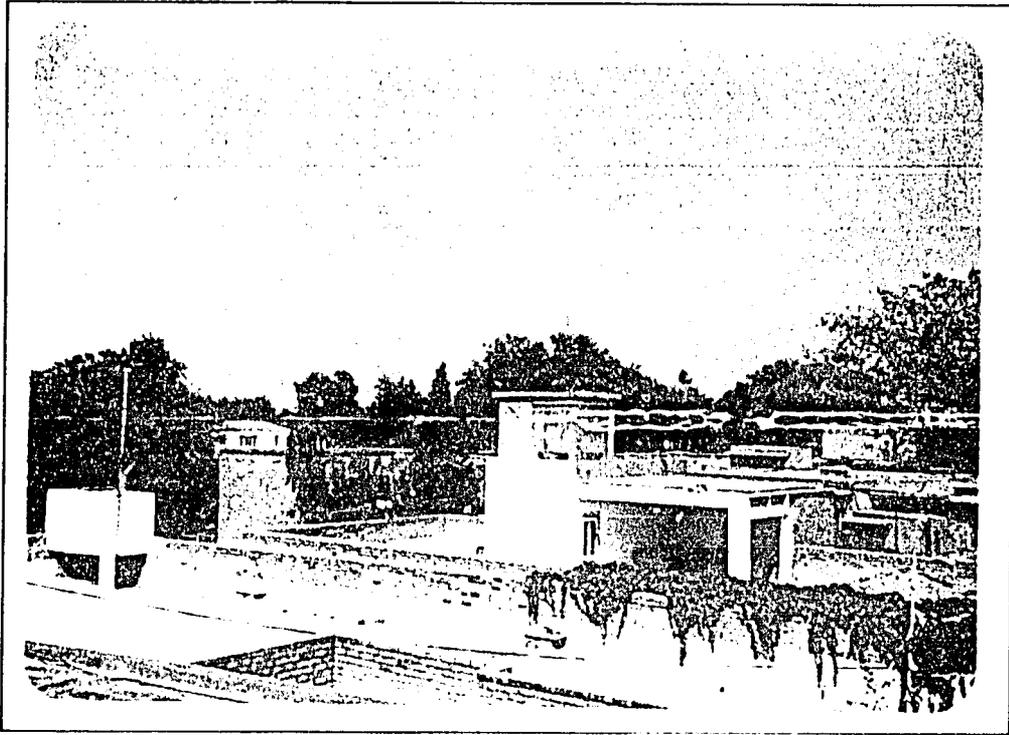


Figure 15 Peshawar IRC Office Facility. View north northeast.

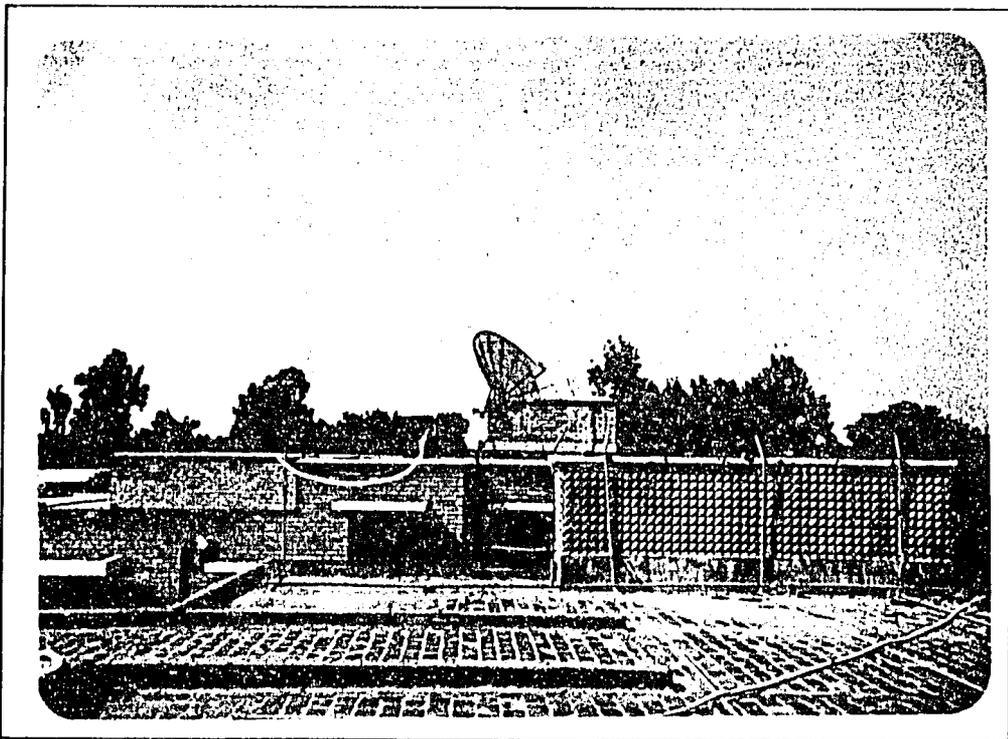


Figure 16 Peshawar IRC Office Facility. View North.

Site Photographs

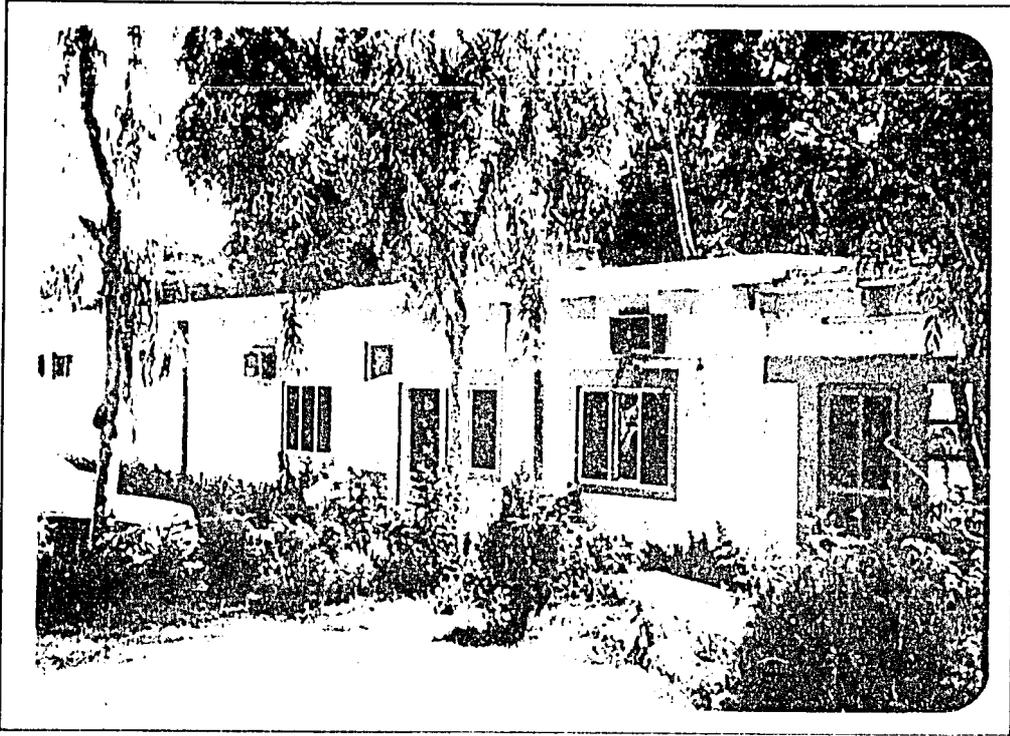


Figure 1 Peshawar IMC Office Facility. COP (left) Administration (right).

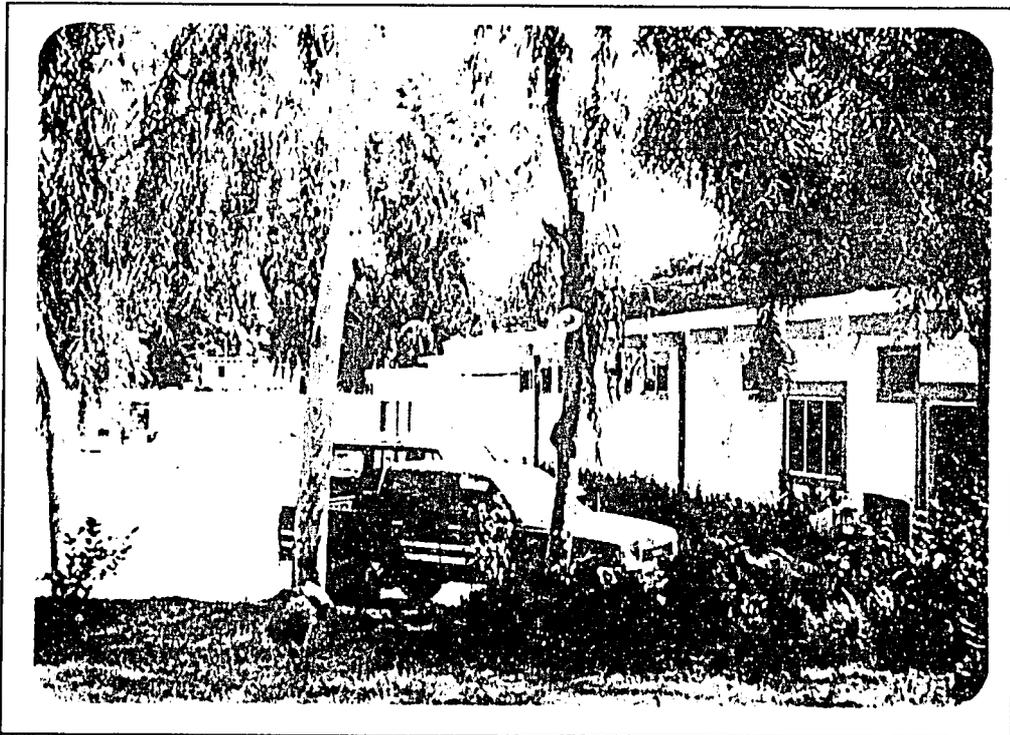


Figure 2 Peshawar IMC Office Facility. Warehouse and storage facility.

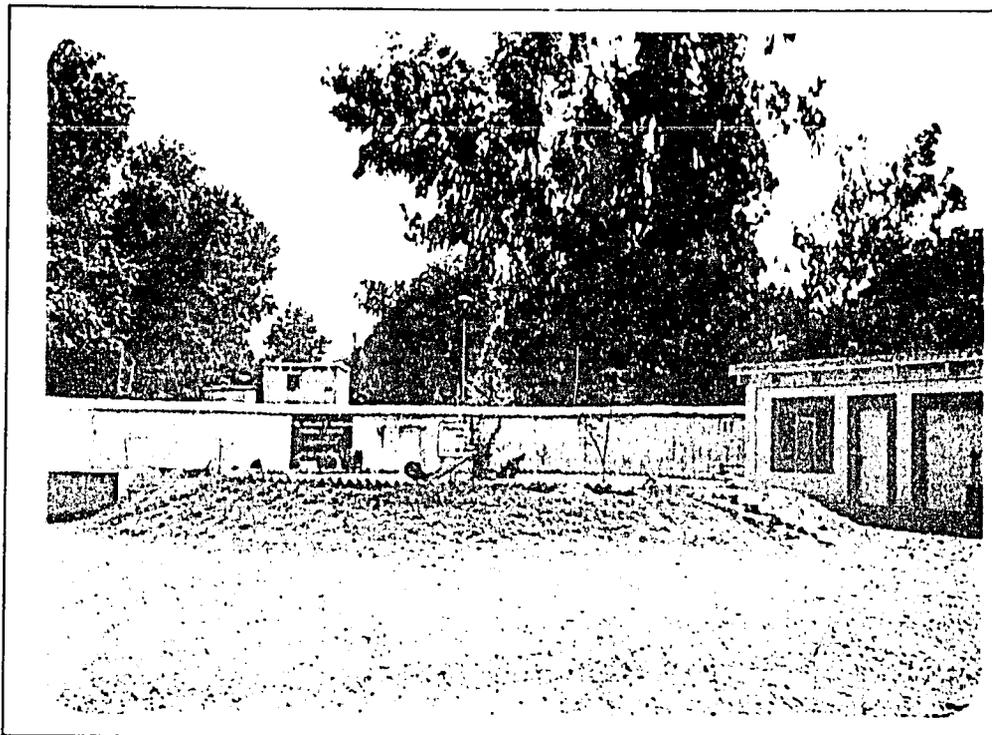


Figure 3 Peshawar IMC Office Facility. Proposed antenna location (center).

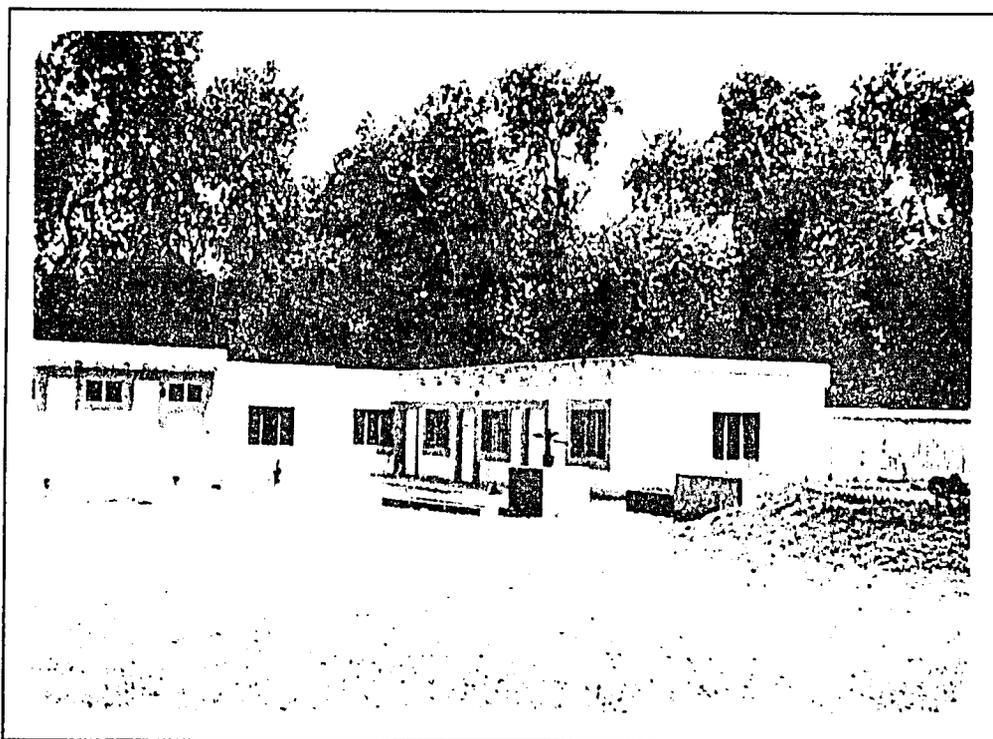


Figure 4 Peshawar IMC Office Facility. Engineer's office.

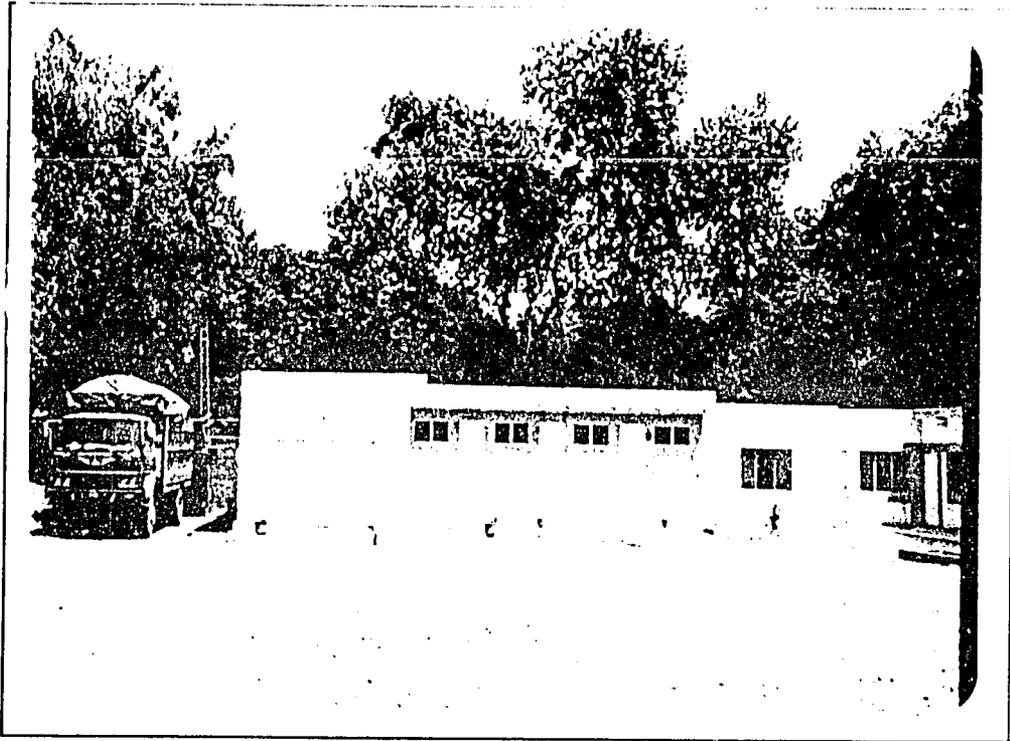


Figure 5 Peshawar IMC Office Facility. Storage facility on left. Typical vehicle used to deliver supplies. Engineer's office, right hand facing window.

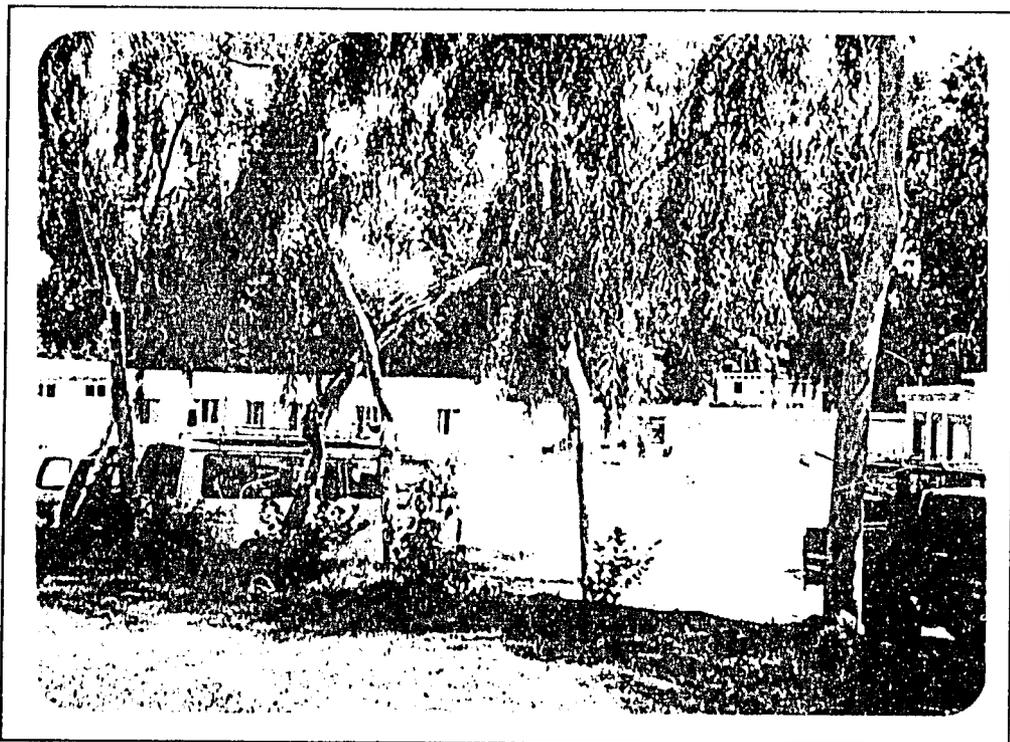


Figure 6 Peshawar IMC Office Facility. General view of parking lot and facility.

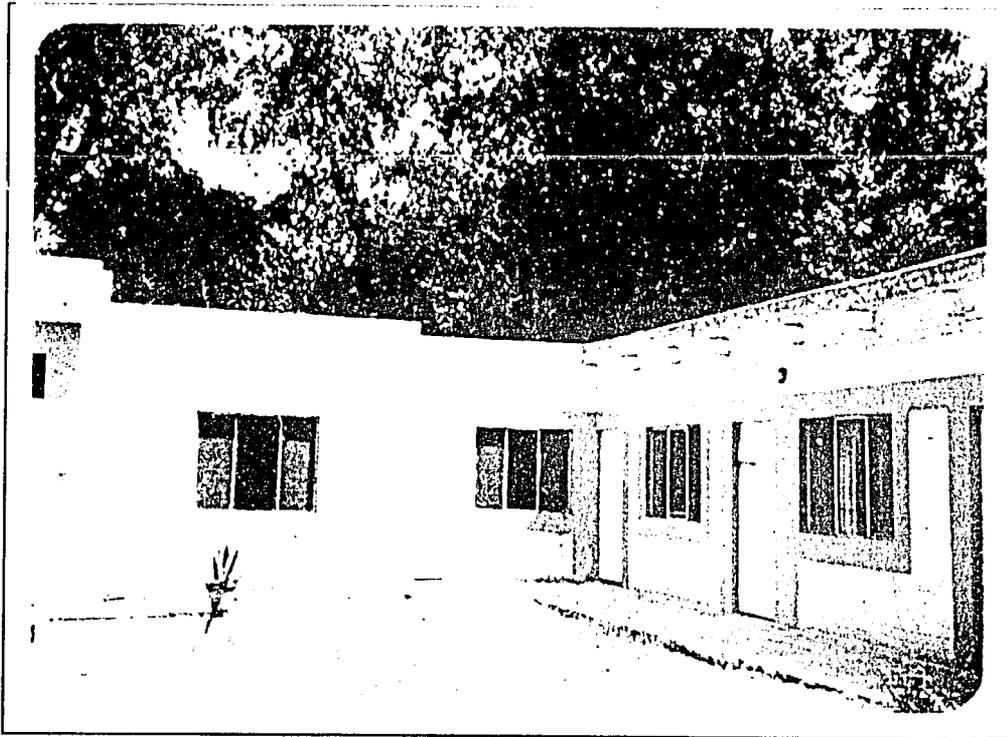


Figure 7 Peshawar IMC Office Facility. Engineer's office (center).

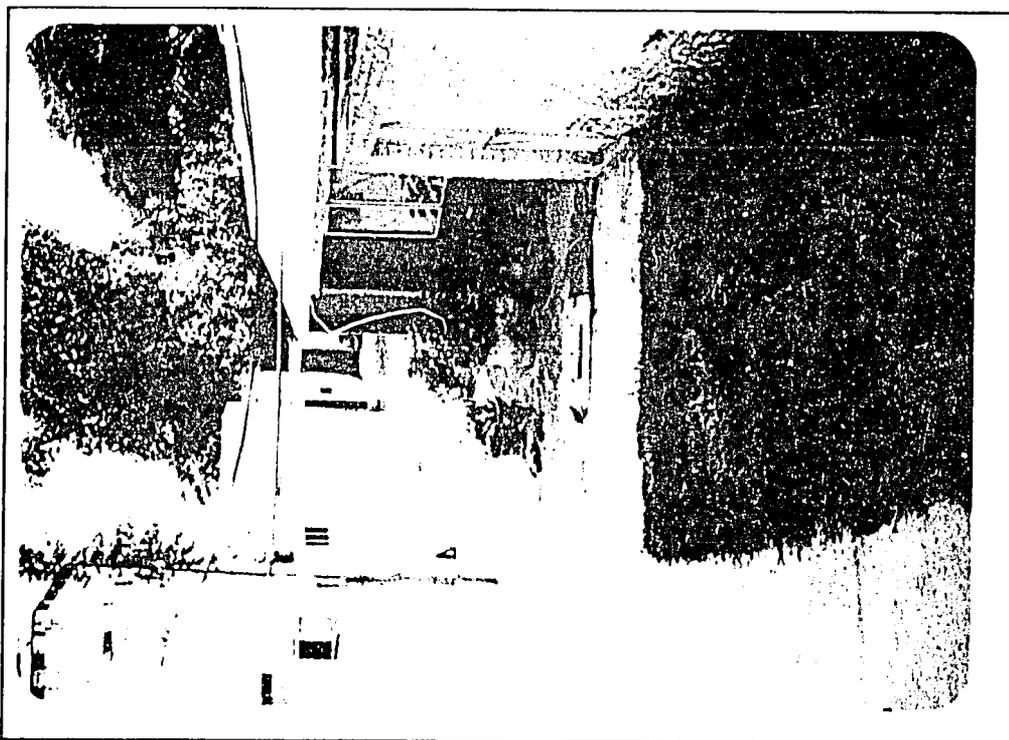


Figure 8 Peshawar IMC Office Facility. Medical compound (southern portion of the facility).

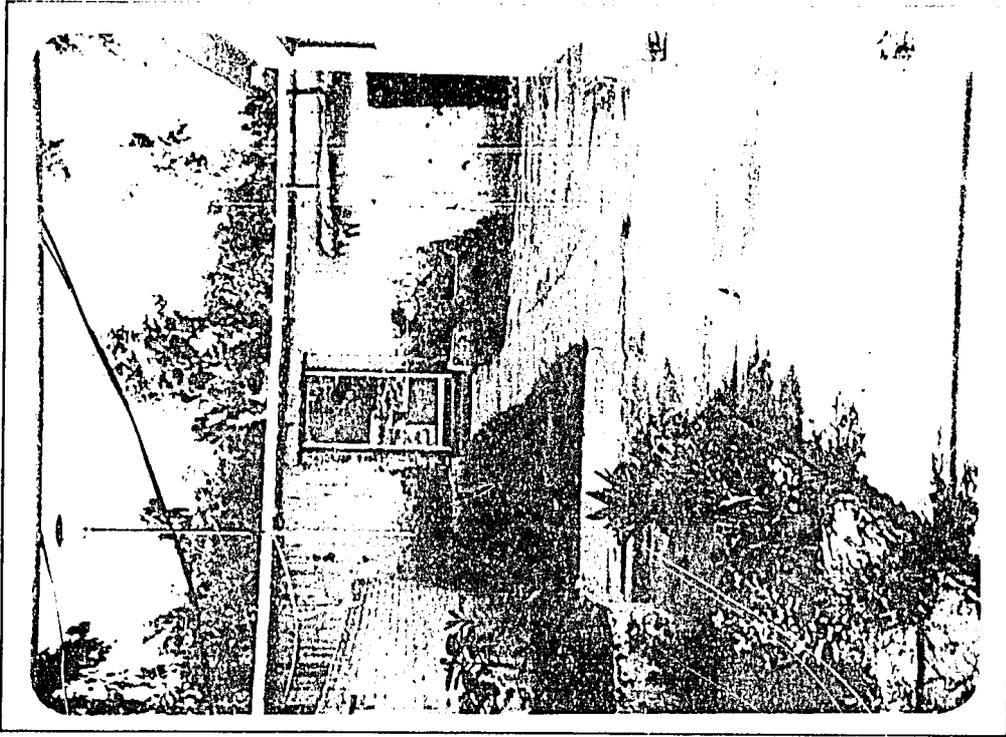


Figure 9 Peshawar IMC Office Facility. View from the medical compound (facing South).



Figure 10 Peshawar IMC Office Facility. COP's office, window on left.

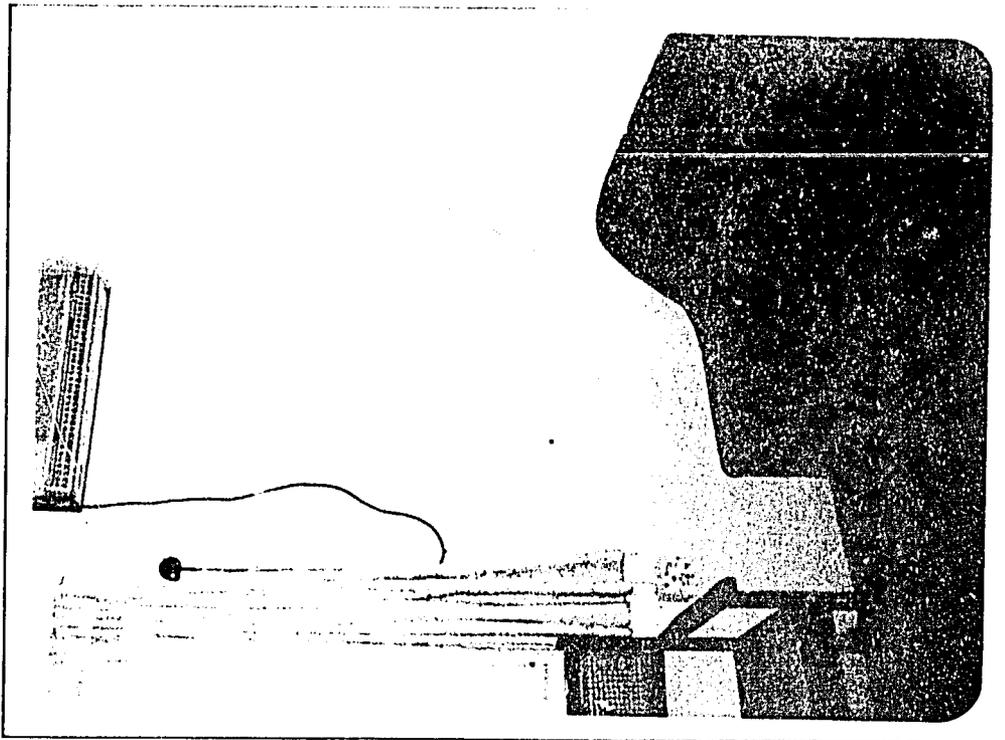


Figure 11 Peshawar IMC Office Facility. COP's office, proposed location of the BSAA equipment. Power outlet available next to chair (right).

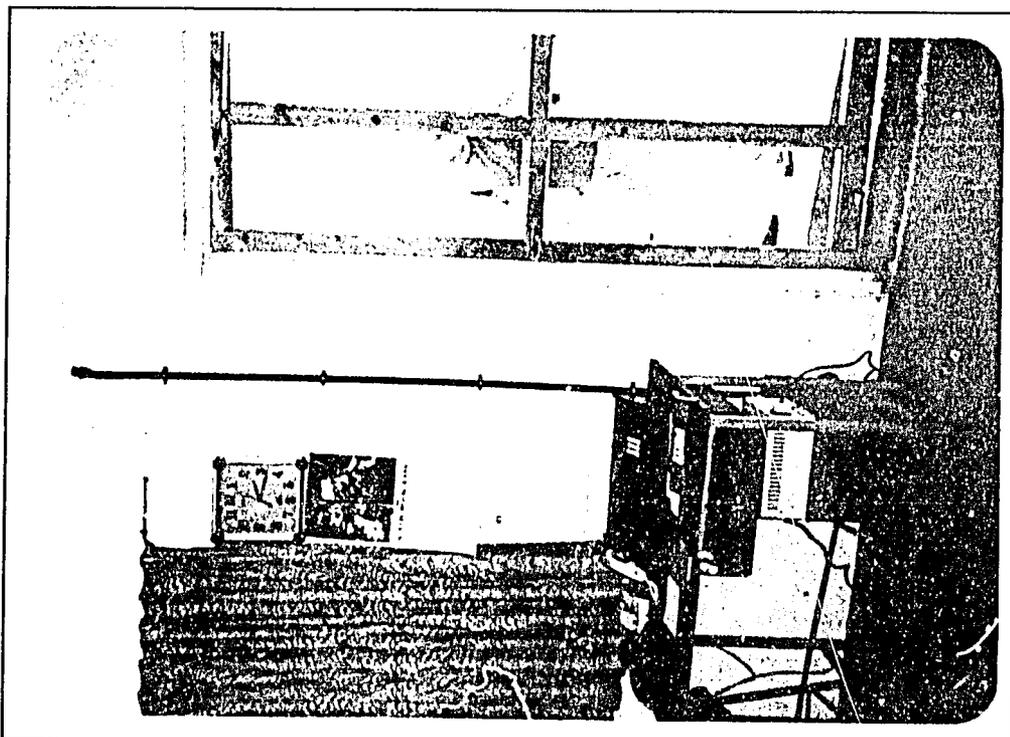


Figure 12 Peshawar IMC Office Facility. Administration office. Phone to be located next to switchboard.



Figure 13 Peshawar IMC Office Facility. Toyota Hilux Pickup and Toyota Long-Wheel Base Land Cruiser.



Figure 14 Peshawar IMC Office Facility. Toyota Hilux pickup, driver side.



Figure 15 Peshawar IMC Office Facility. Toyota Hilux pickup rear bed.

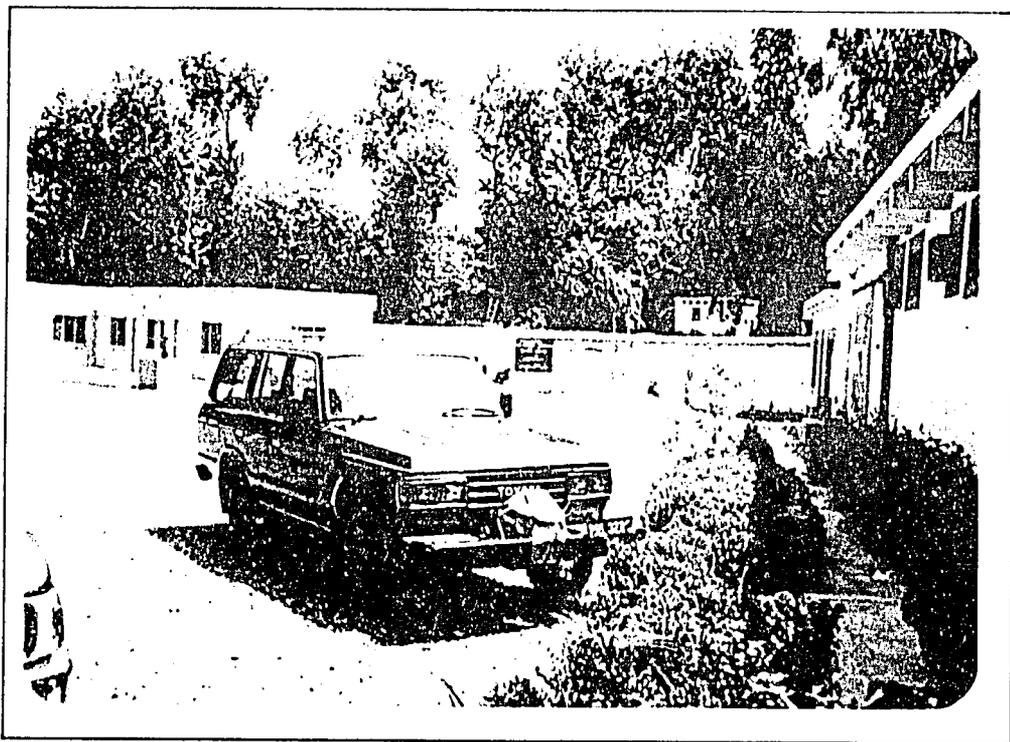
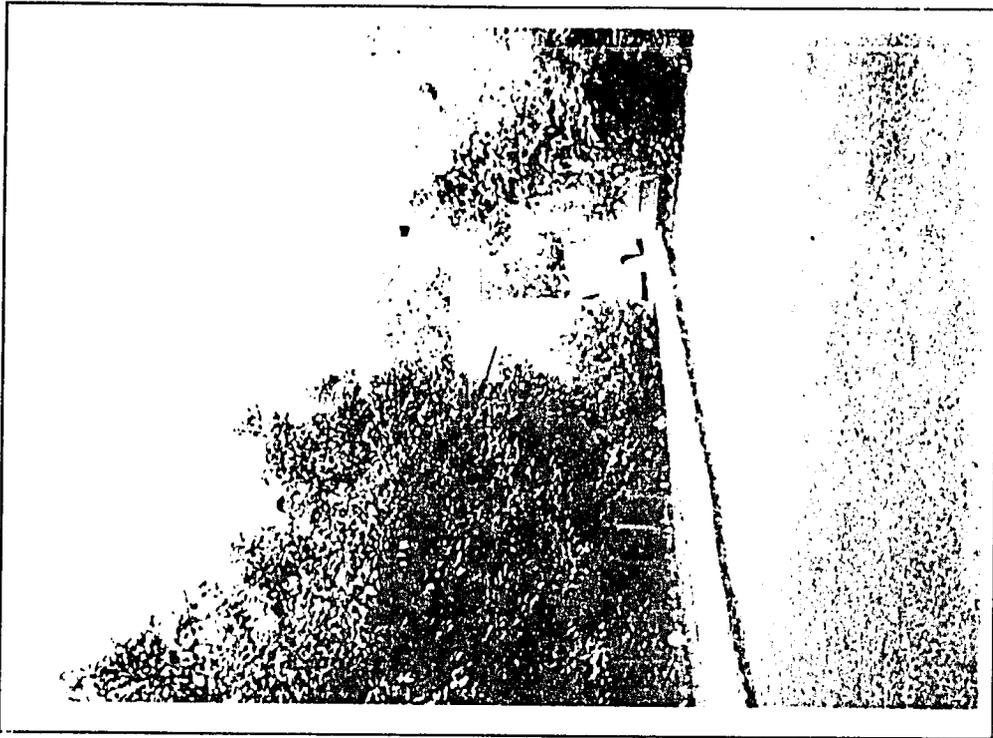


Figure 16 Peshawar IMC Office Facility. Toyota Land Cruiser.



Figure 17 Peshawar IMC Office Facility. Toyota Land Cruiser rear section.

Site Photographs



**Figure 1** Peshawar CARE Office Facility. Entrance to building area within compound.



**Figure 2** Peshawar CARE Office Facility. Basement windows of proposed location of the BSAA equipment.

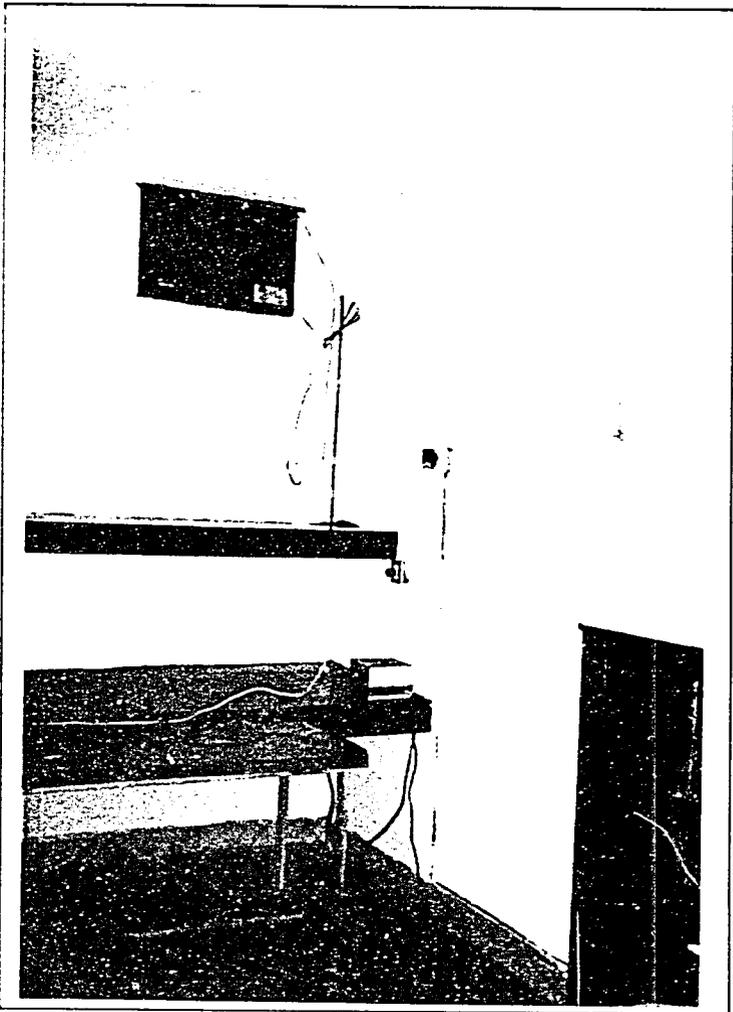


Figure 3 Peshawar CARE Office Facility. Basement location for the BSAA equipment.

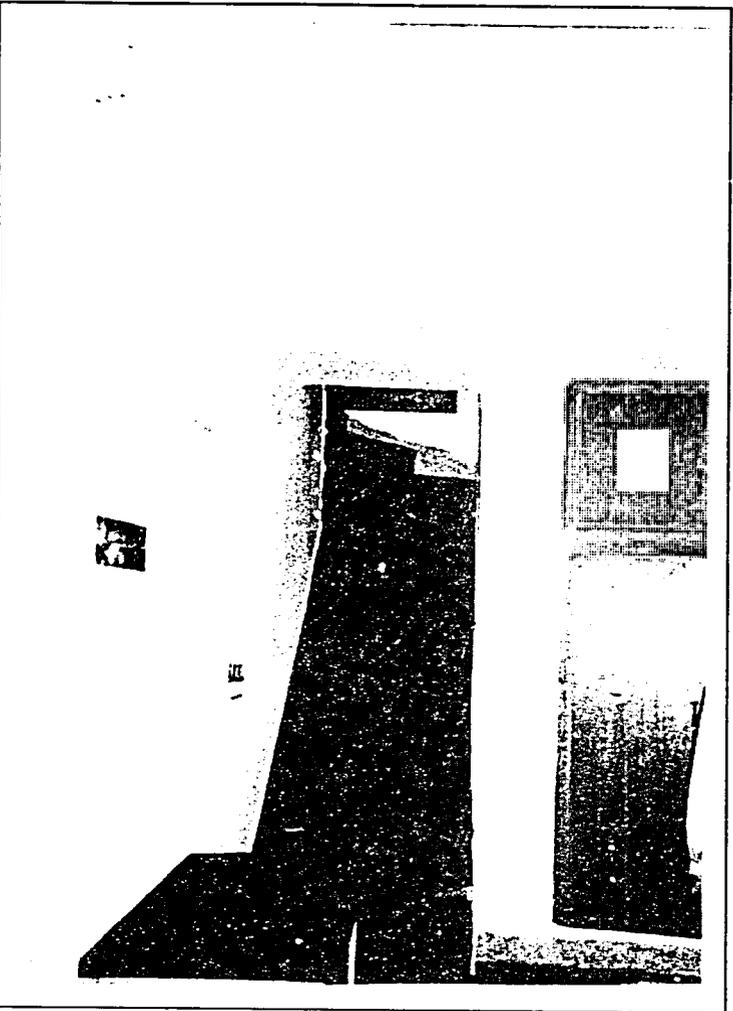


Figure 4 Peshawar CARE Office Facility. Basement location looking at cable path along ceiling of left wall, to top of stairs.

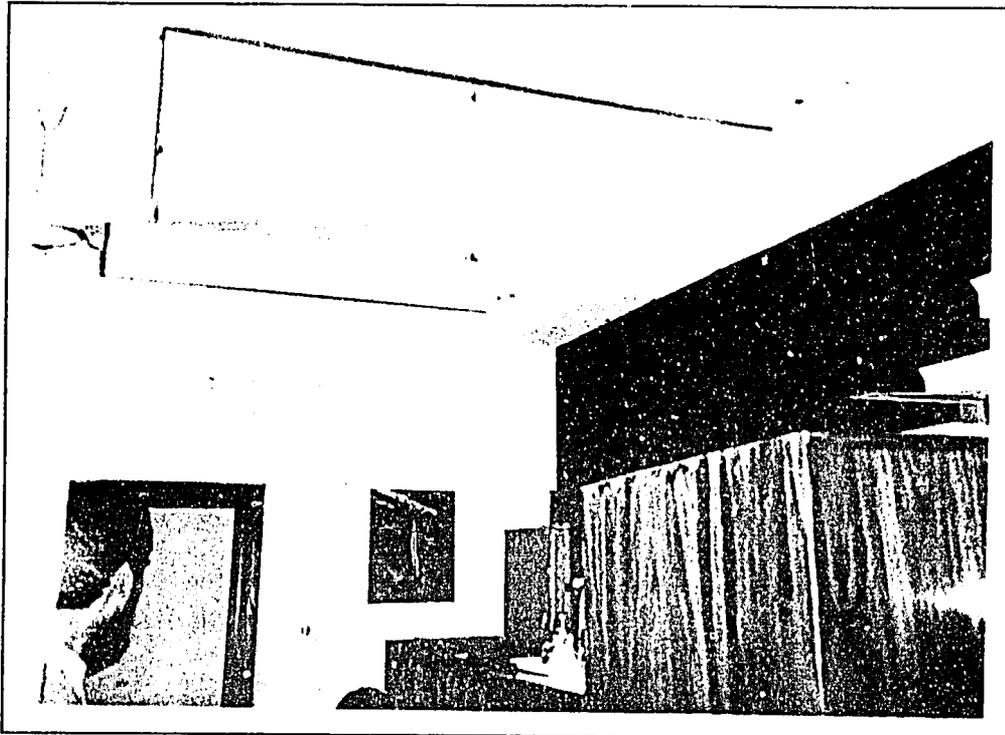


Figure 5 Peshawar CARE Office Facility. Cable path from basement door, up to ceiling, along beam (to the right).

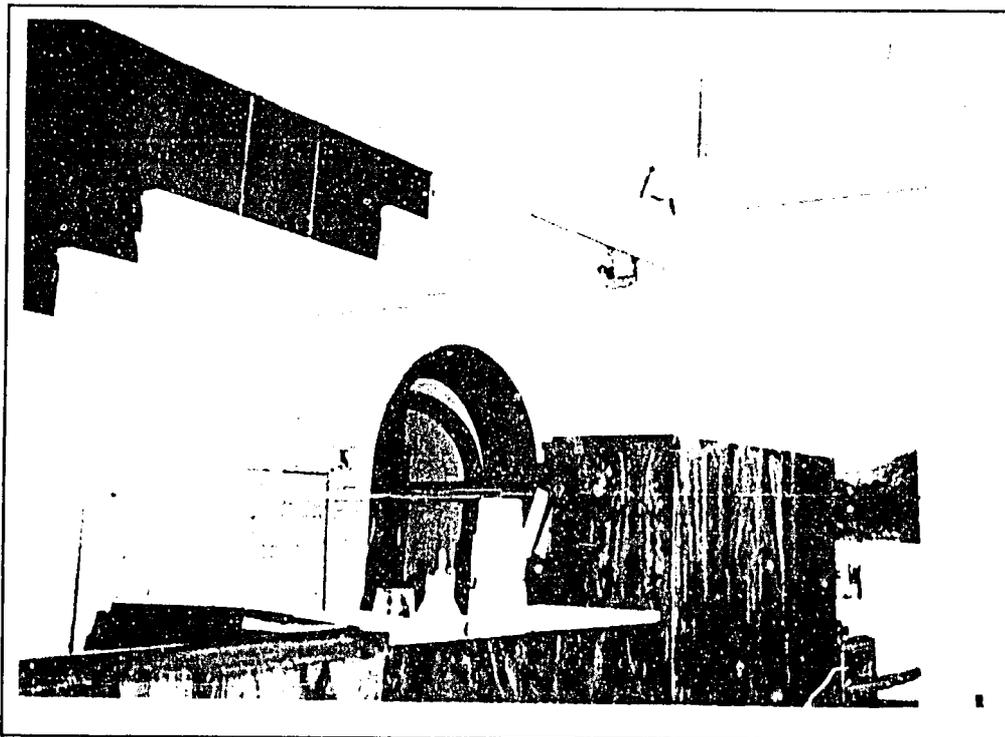


Figure 6 Peshawar CARE Office Facility. Cable route along beam to wall (right). Three cables through door (left), one cable routed to office on the right side of beam.

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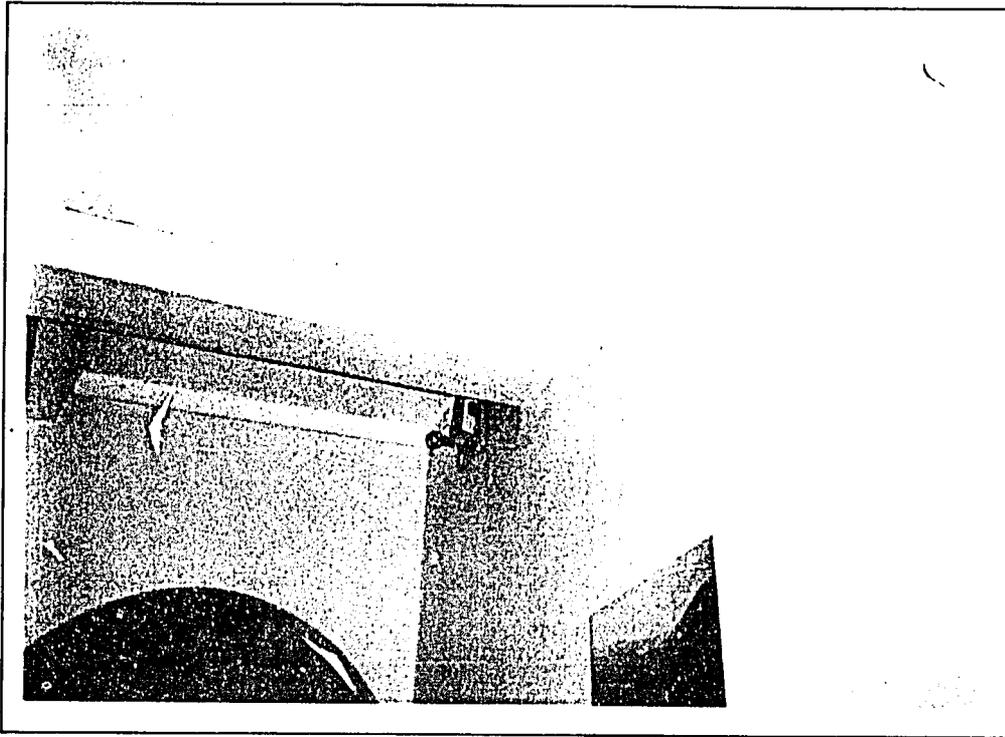


Figure 7 Peshawar CARE Office Facility. Detail of ceiling beam at wall.

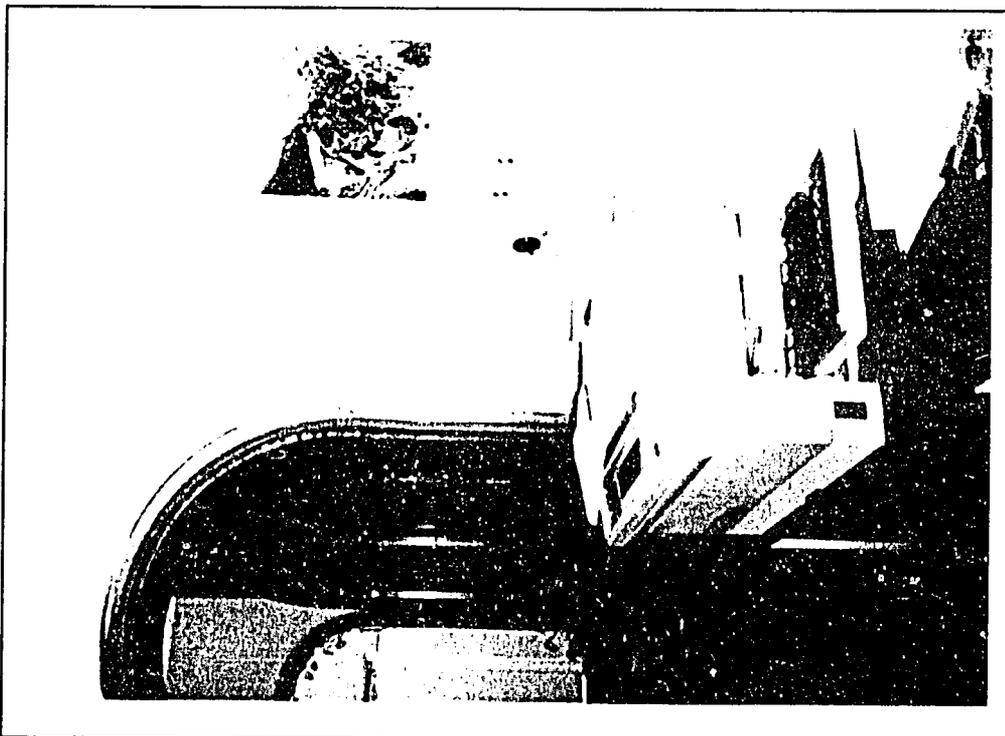


Figure 8 Peshawar CARE Office Facility. Hallway to other offices. Three cables to be routed into hallway.

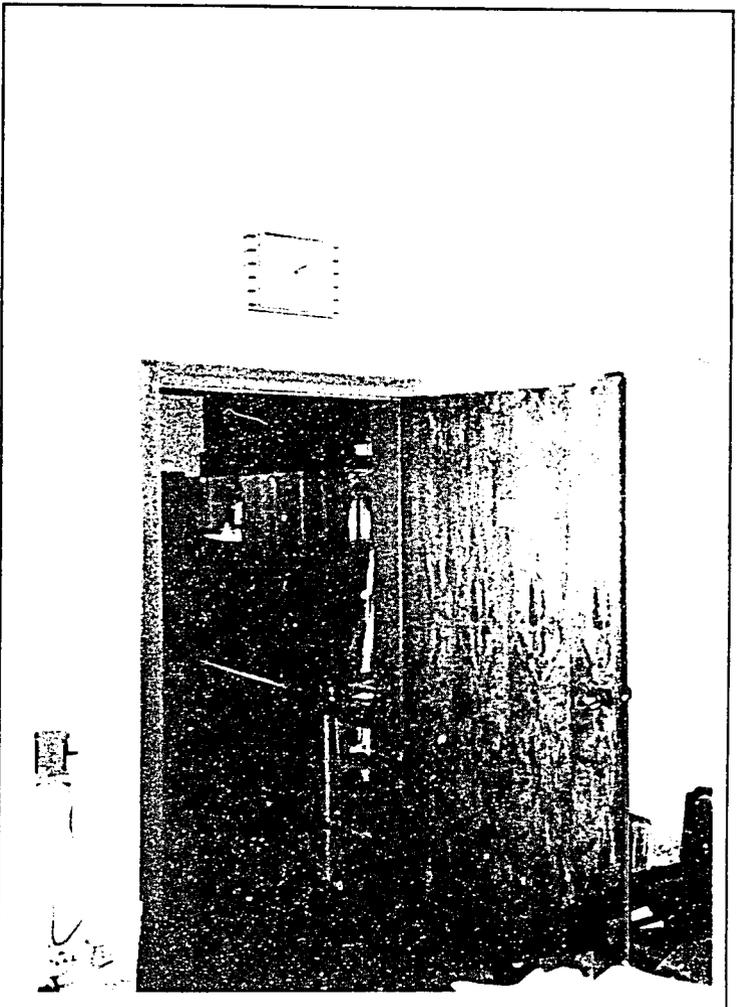


Figure 9 Peshawar CARE Office Facility. View of office entry for Phone No. 4.

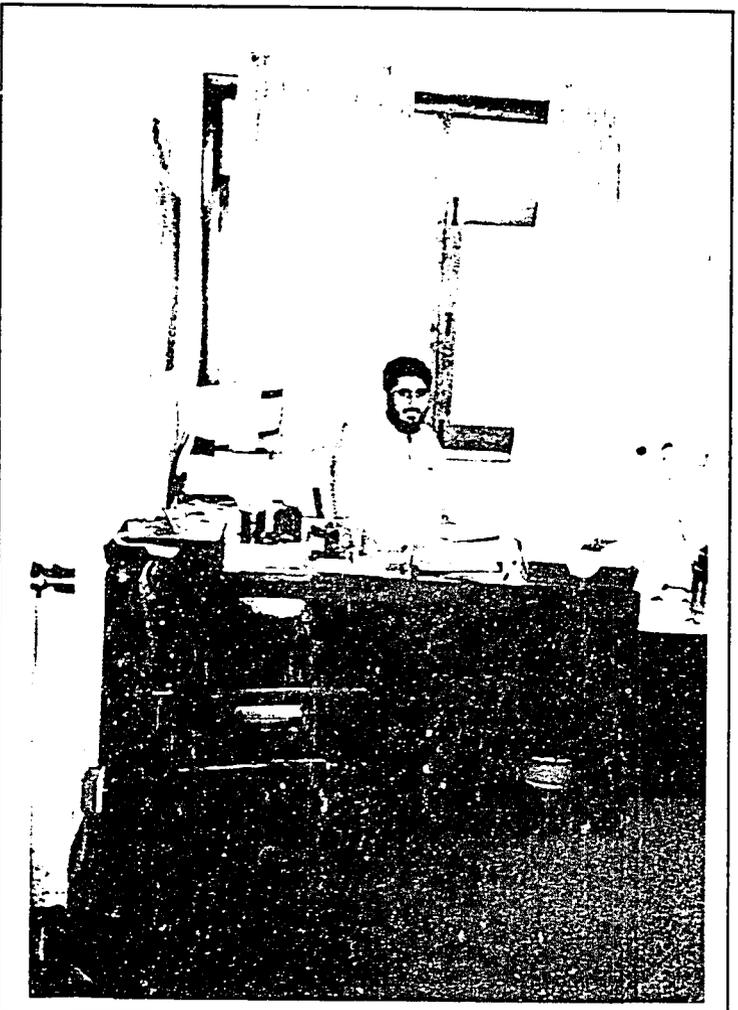


Figure 10 Peshawar CARE Office Facility. Place Phone No. 4 on Desk. Route cables along base tiling.

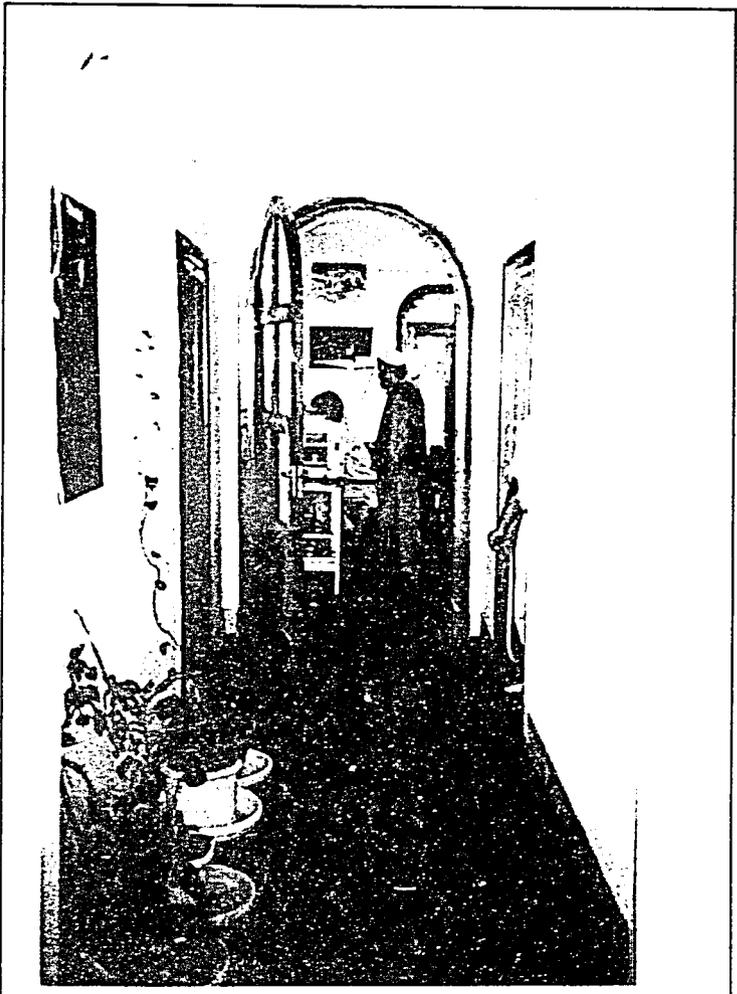


Figure 11 Peshawar CARE Office Facility. Hallway leading to Phone 2 (left door) and Phone 3 (right door) locations.

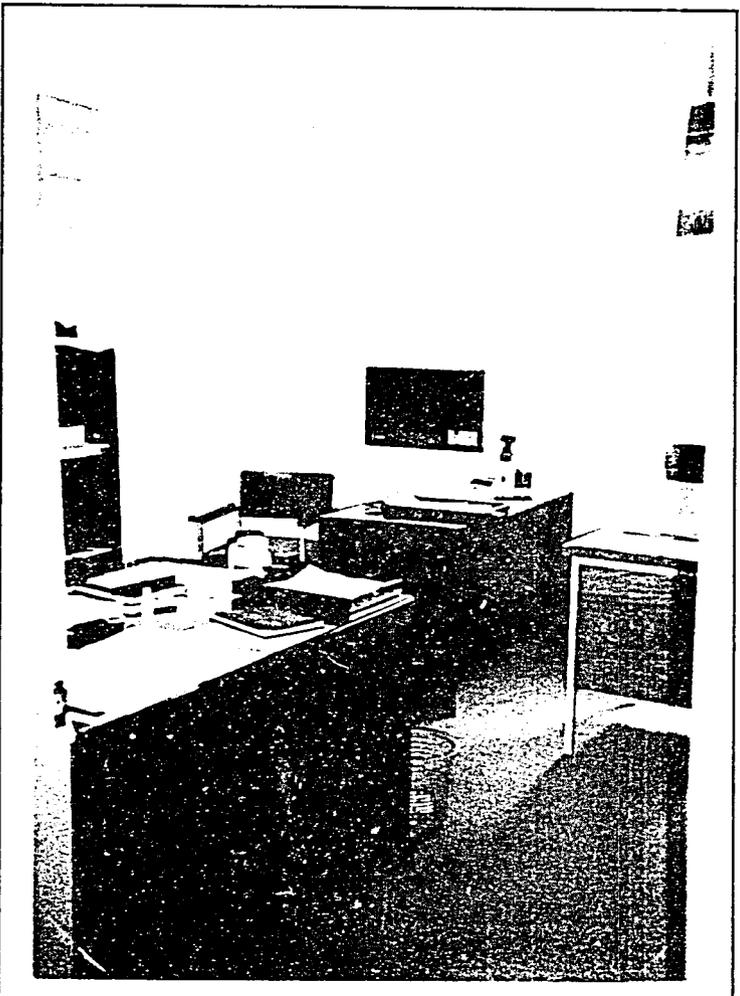


Figure 12 Peshawar CARE Office Facility. Office for Phone No. 2. Locate phone on desk (left).

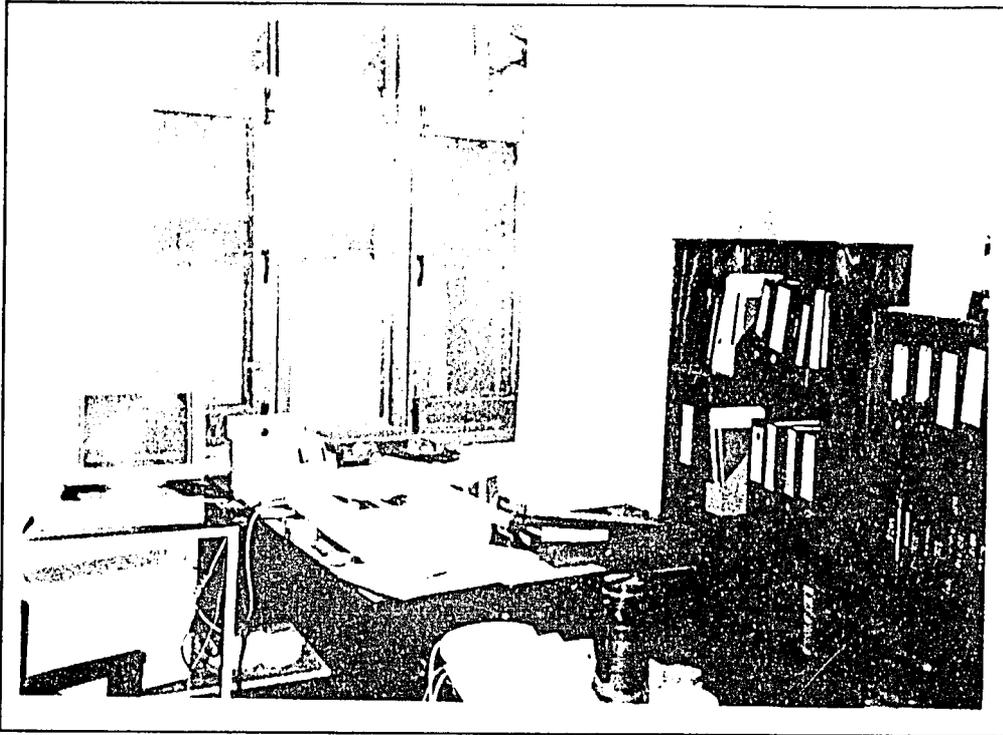


Figure 13 Peshawar CARE Office Facility. Phone No. 3 Office. Place phone on desk.

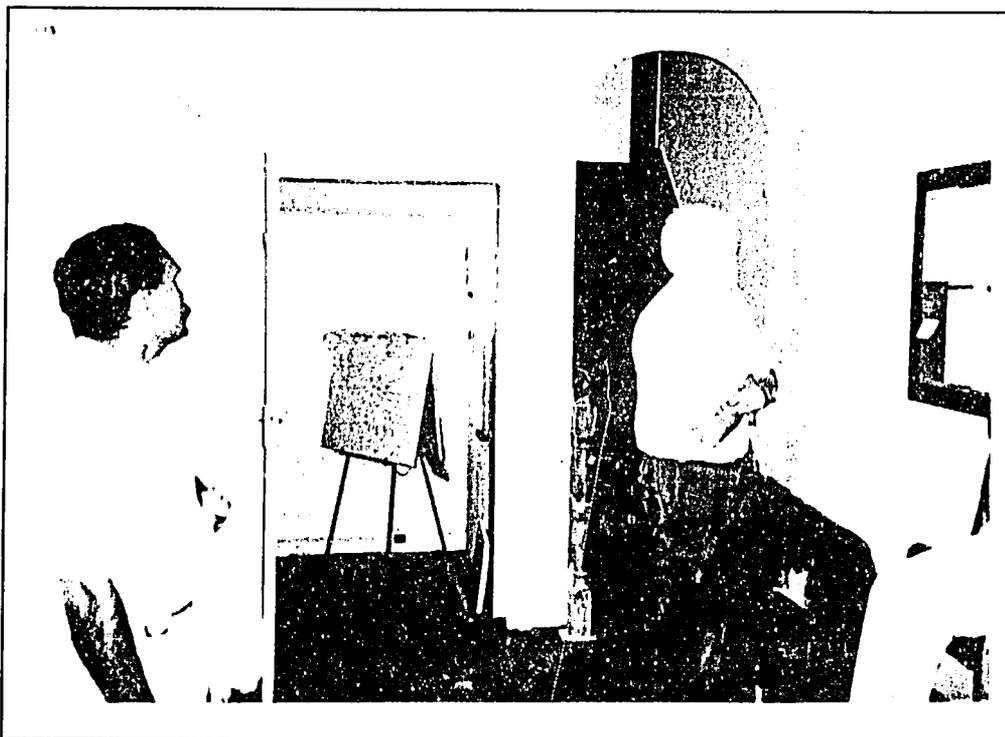
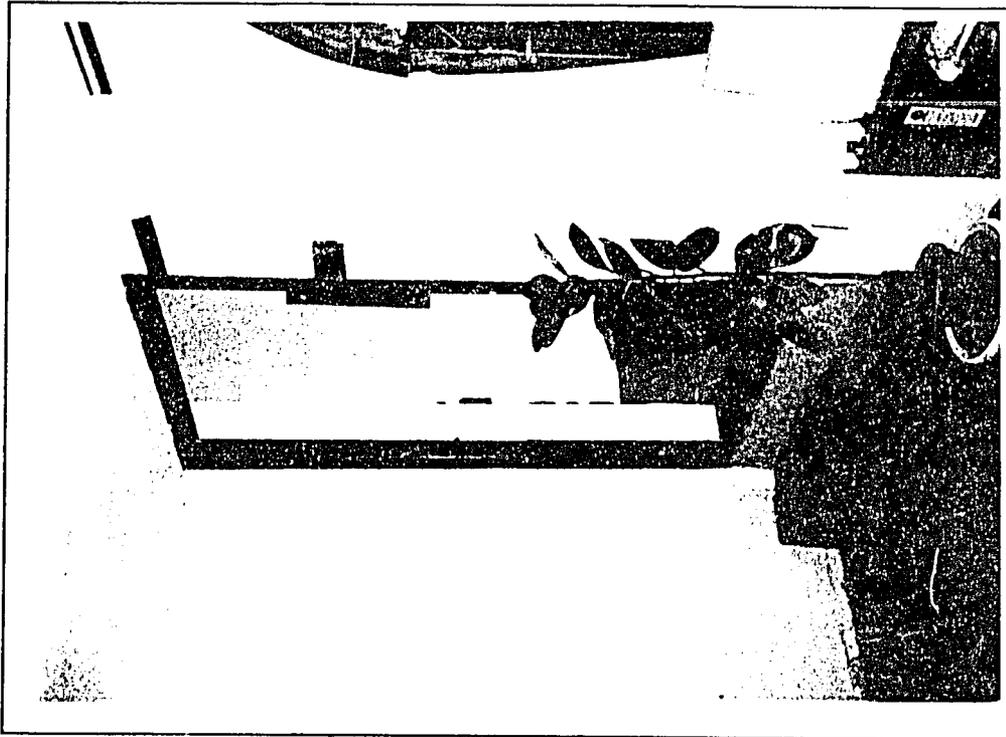
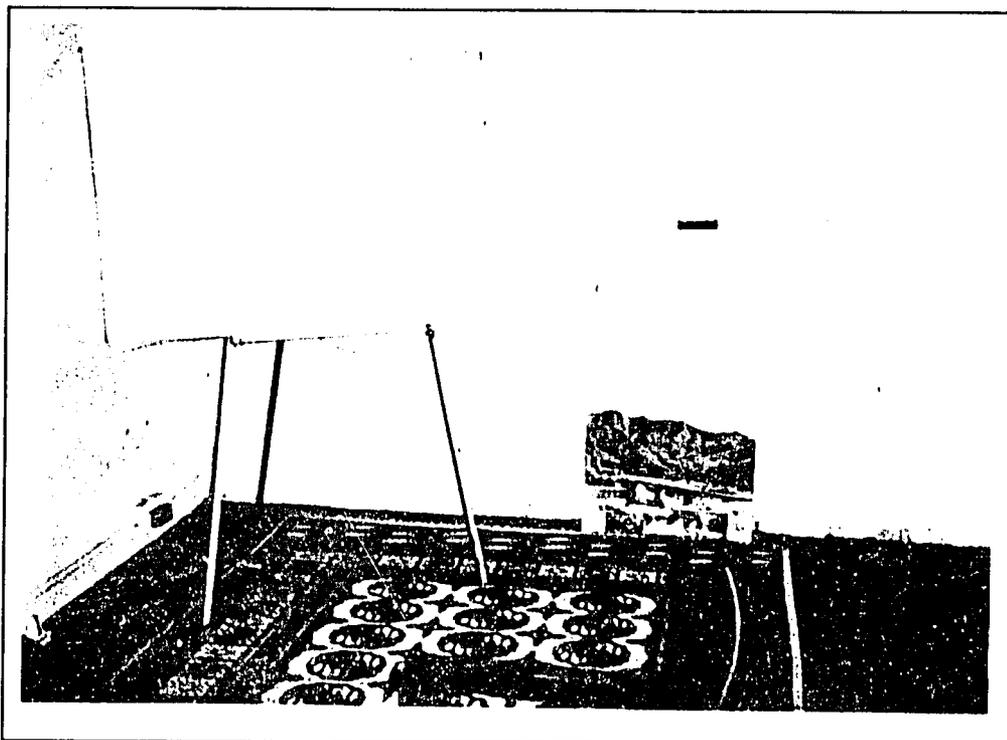


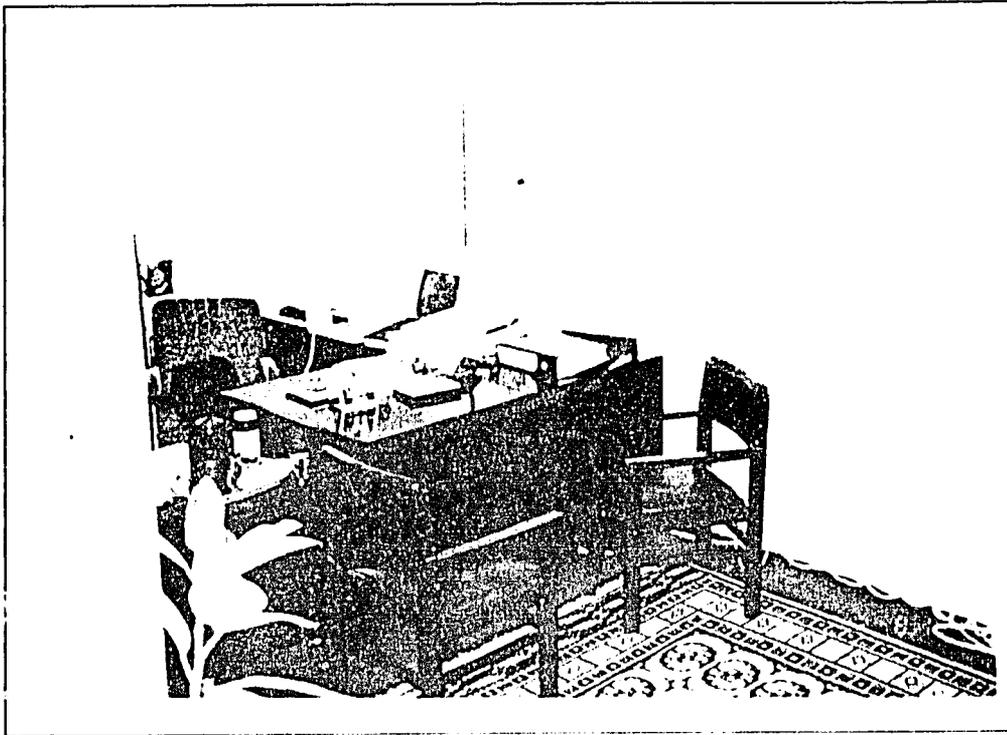
Figure 14 Peshawar CARE Office Facility. Director's Office (left door). Phone No. 1. Route cables along right wall, under stair, into office.



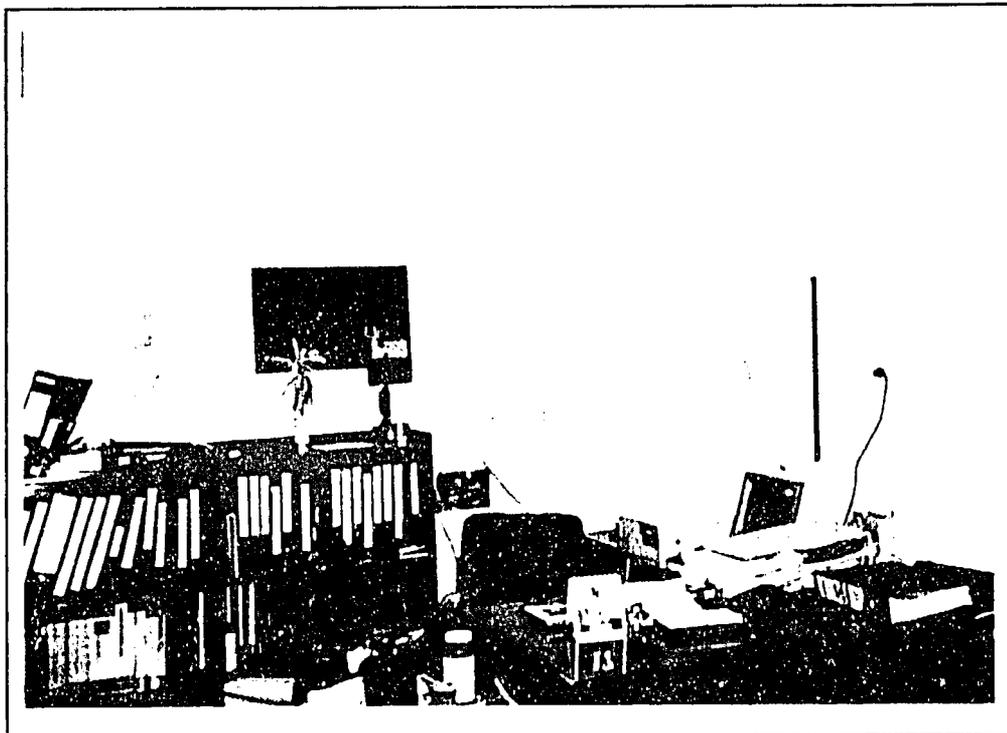
**Figure 15** Peshawar CARE Office Facility. View of hallway from Director's office. Route cable through door frame, along floor.



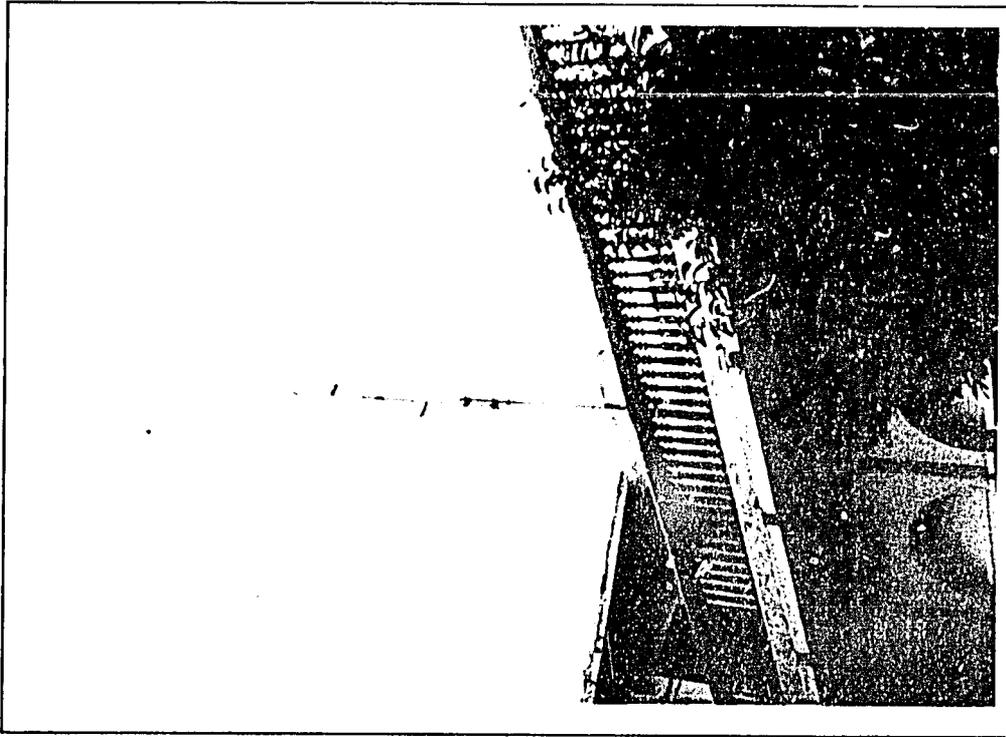
**Figure 16** Peshawar CARE Office Facility. Director's office. Phone No. 1. Route cable along floor.



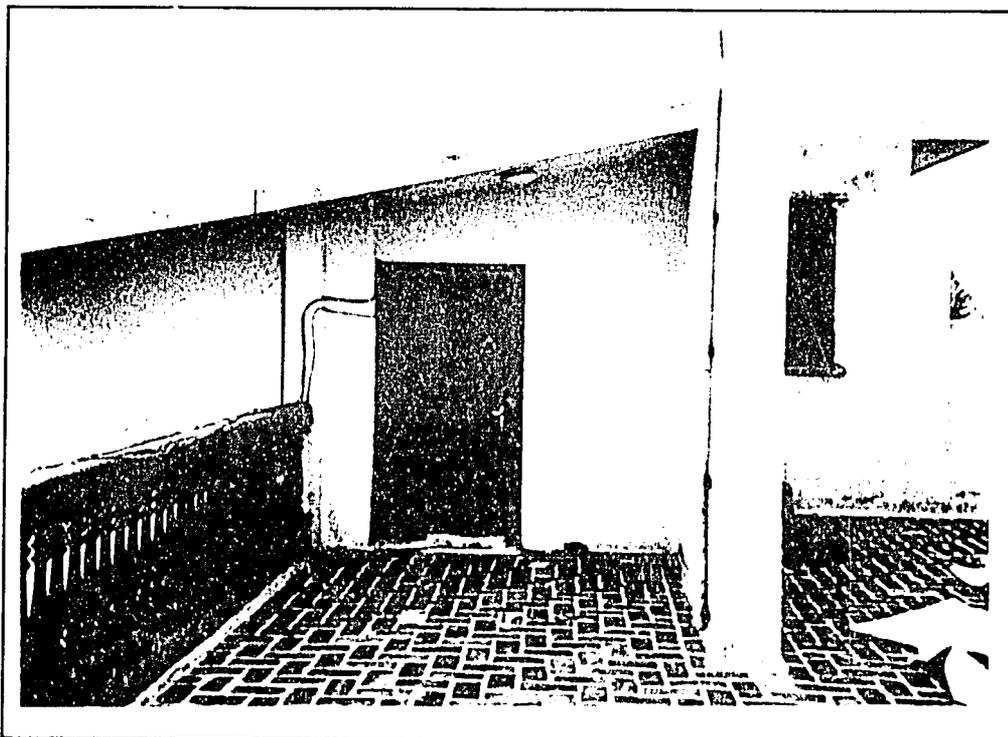
**Figure 17** Peshawar CARE Office Facility. Director's desk. Place phone jack behind right hand chair.



**Figure 18** Peshawar CARE Office Facility. Director's Office.



**Figure 19** Peshawar CARE Office Facility. Existing Embassy VHF CommNet antenna installation.



**Figure 20** Peshawar CARE Office Facility. Entrance to roof area. VHF antenna installation on right.

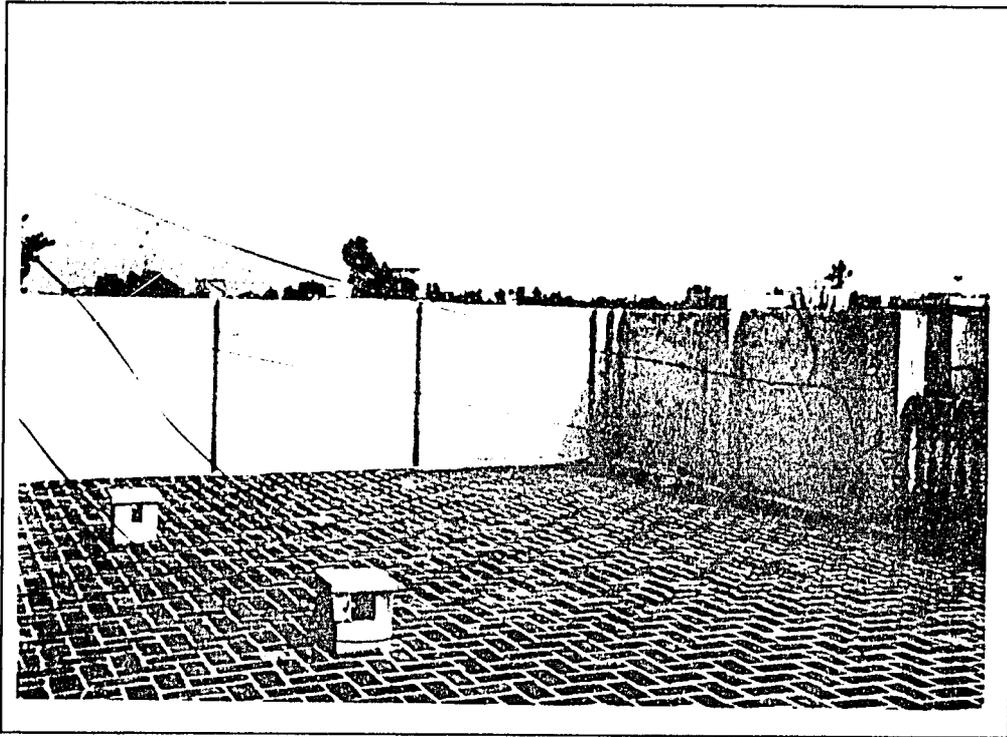


Figure 21 Peshawar CARE Office Facility. Possible location for antenna mast.

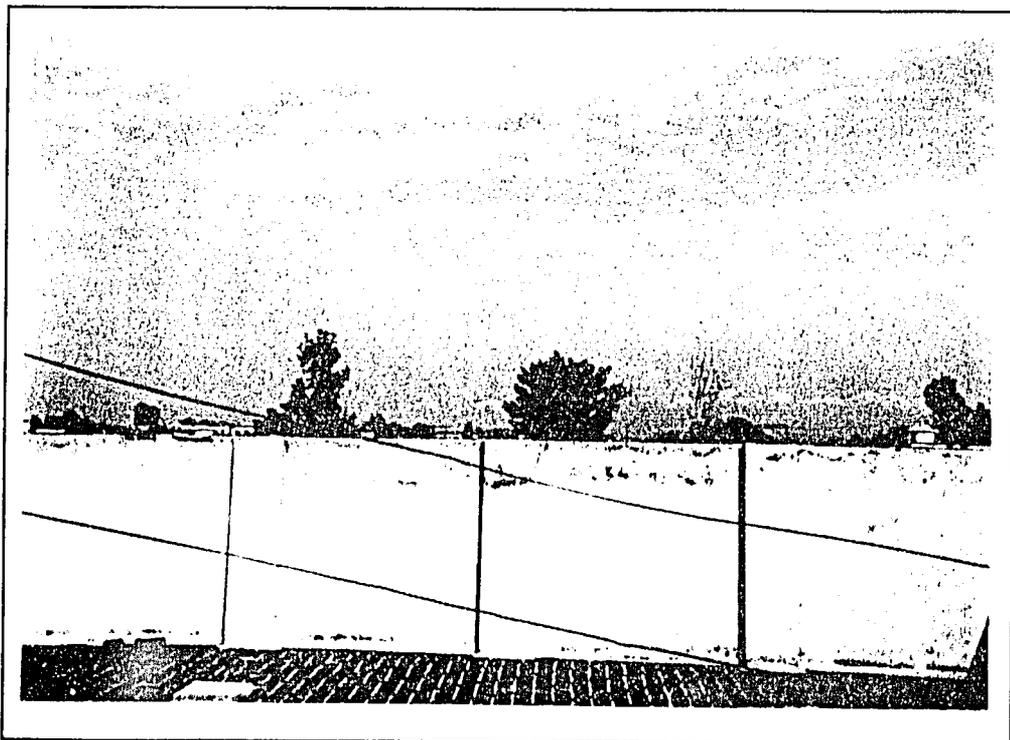


Figure 22 Peshawar CARE Office Facility. Proposed antenna location facing Pabbi.

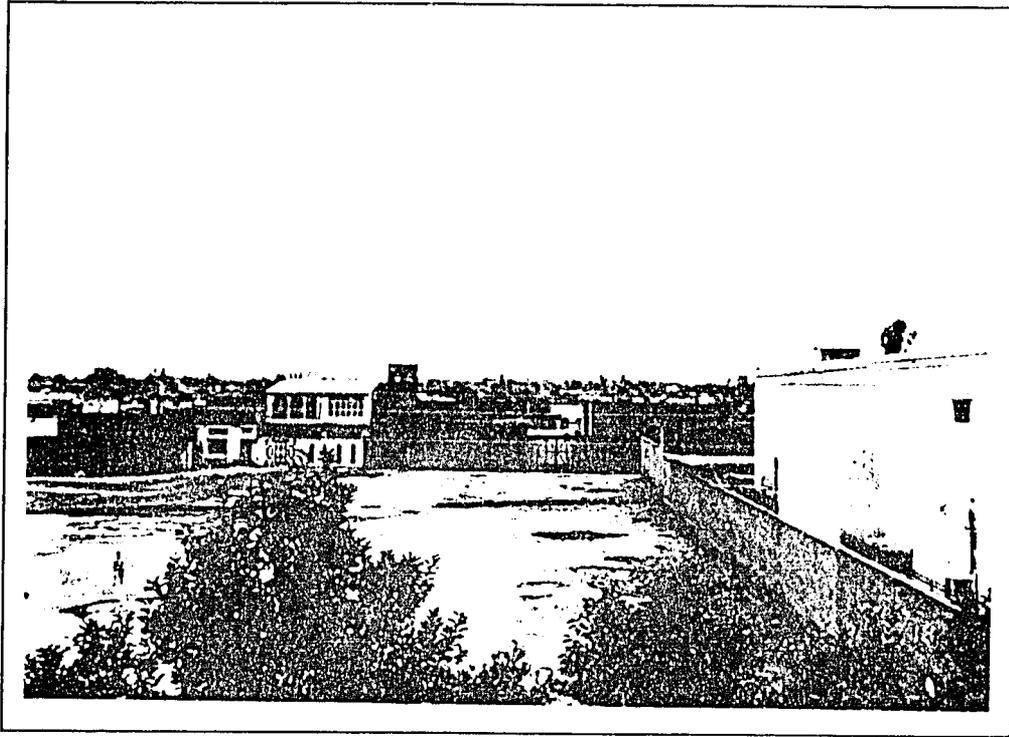


Figure 23 Peshawar CARE Office Facility. View facing South.

Site Photographs

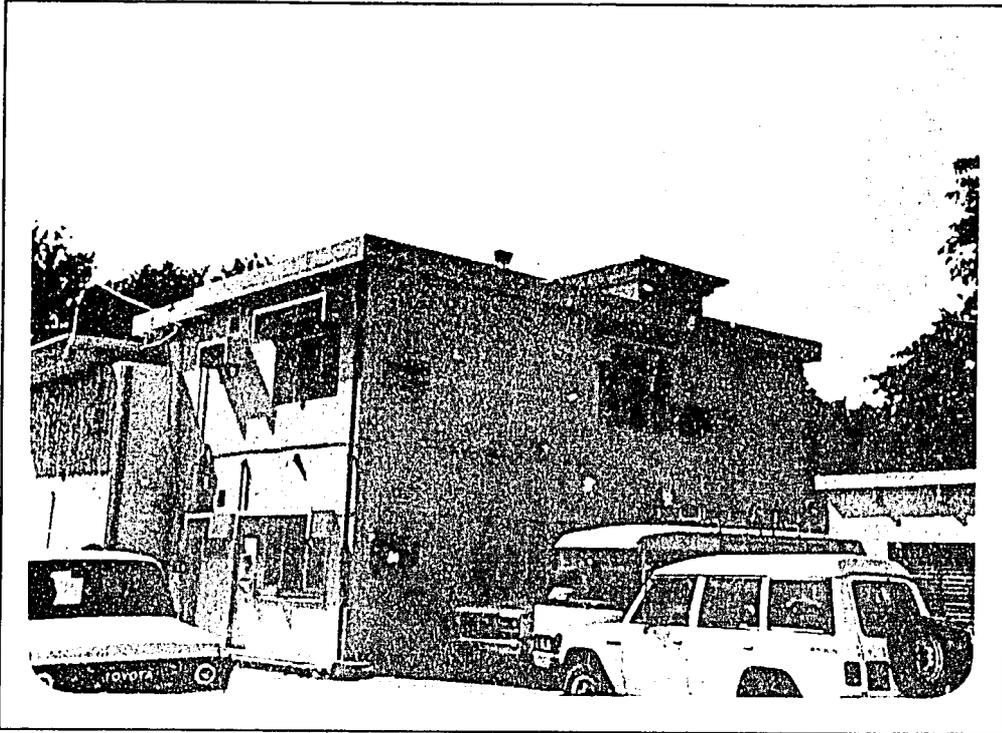


Figure 1 Peshawar AID/Rep Office Facility. Main Office Building (facing South Southwest), referred to as Building No.1.

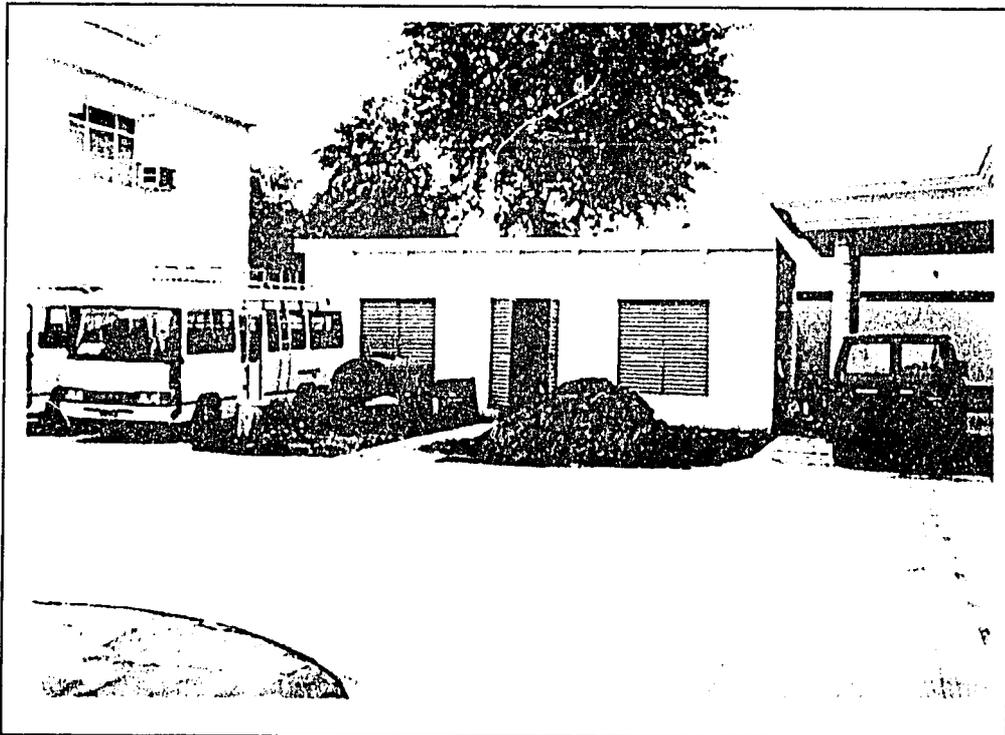


Figure 2 Peshawar AID/Rep Office Facility. Power Building (Facing North).

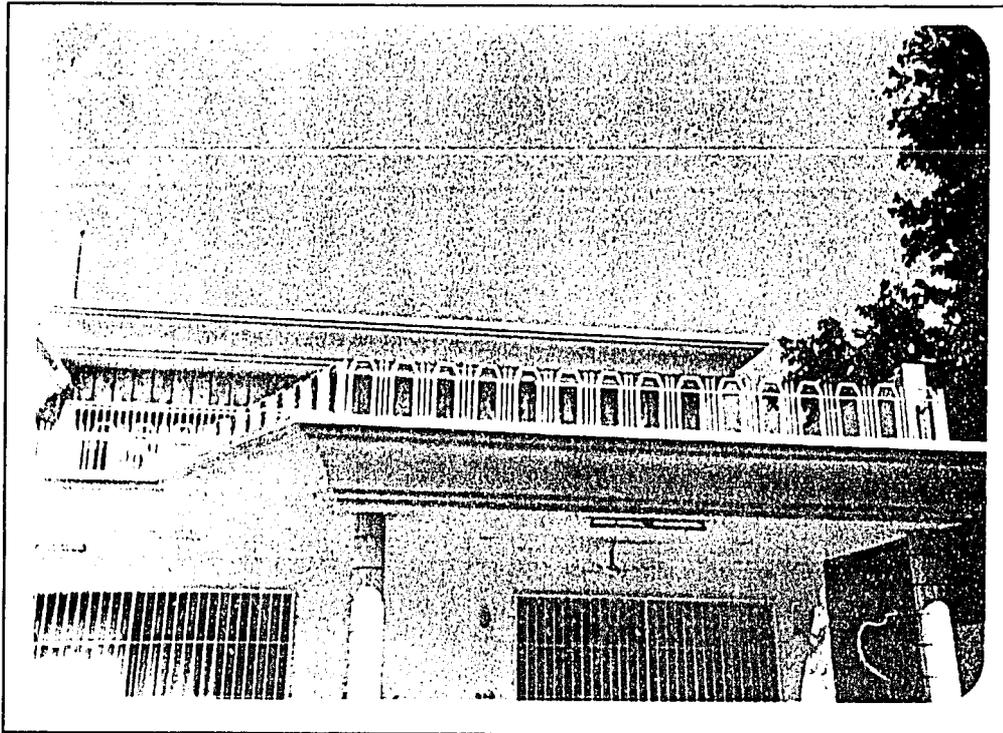


Figure 3 Peshawar AID/Rep Office Facility. Building No. 3 located directly behind Building No. 1



Figure 4 Peshawar AID/Rep Office Facility. Building No. 3.

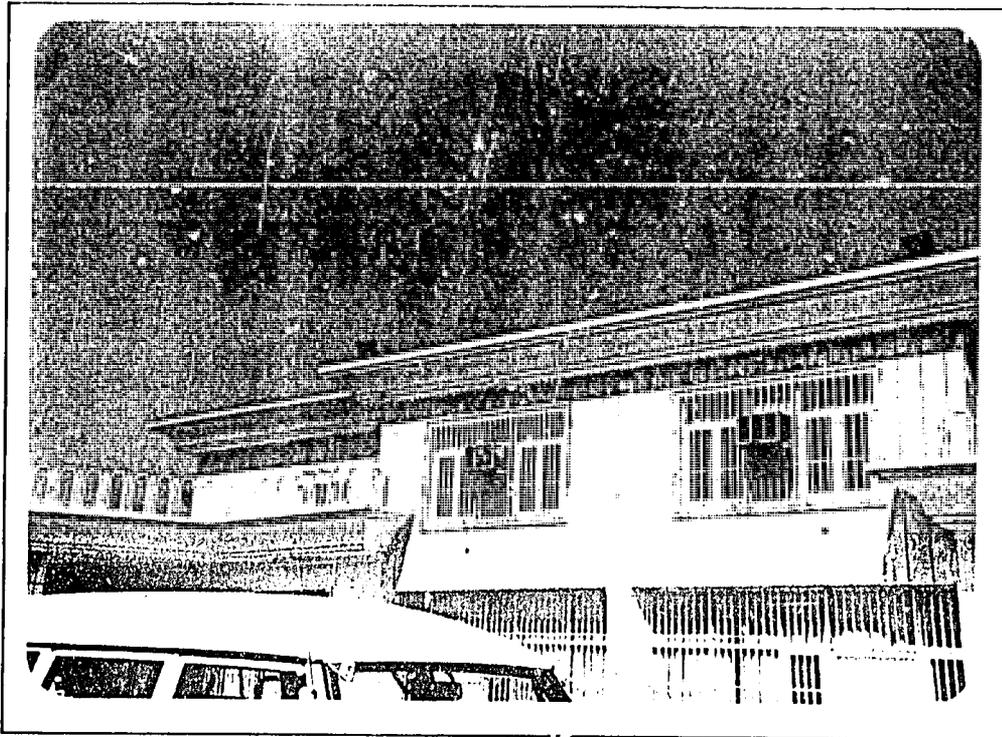


Figure 5 Peshawar AID/Rep Office Facility. Continuation of Building 3 and 4 complex.

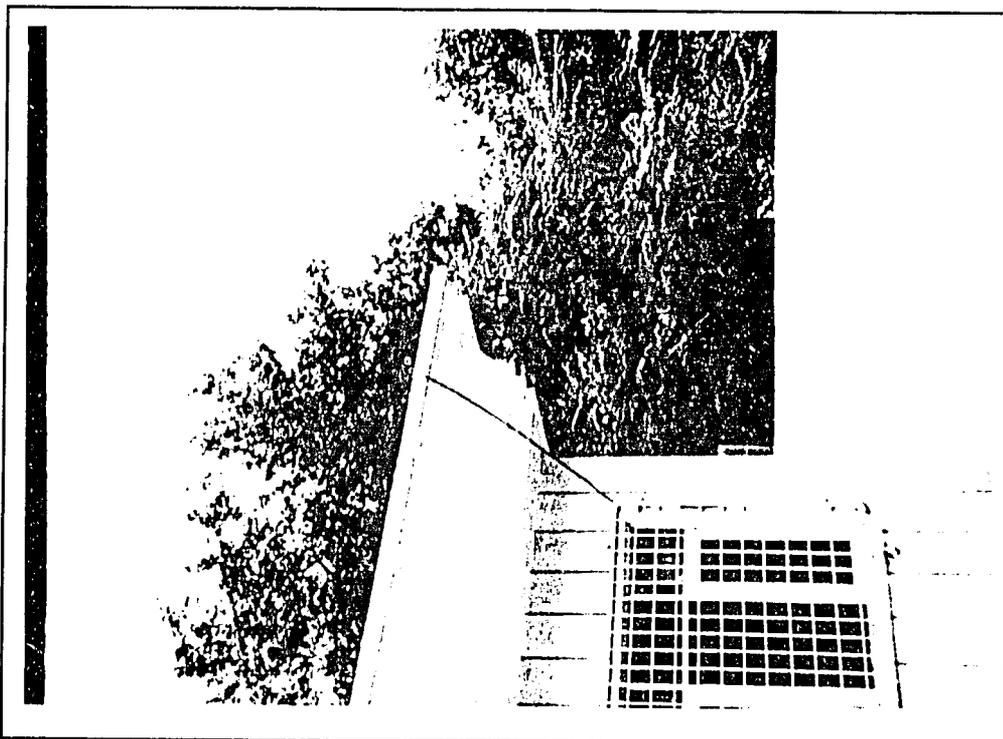


Figure 6 Peshawar AID/Rep Office Facility. South corner of Building 1, existing VHF CommNet coaxial cable run.

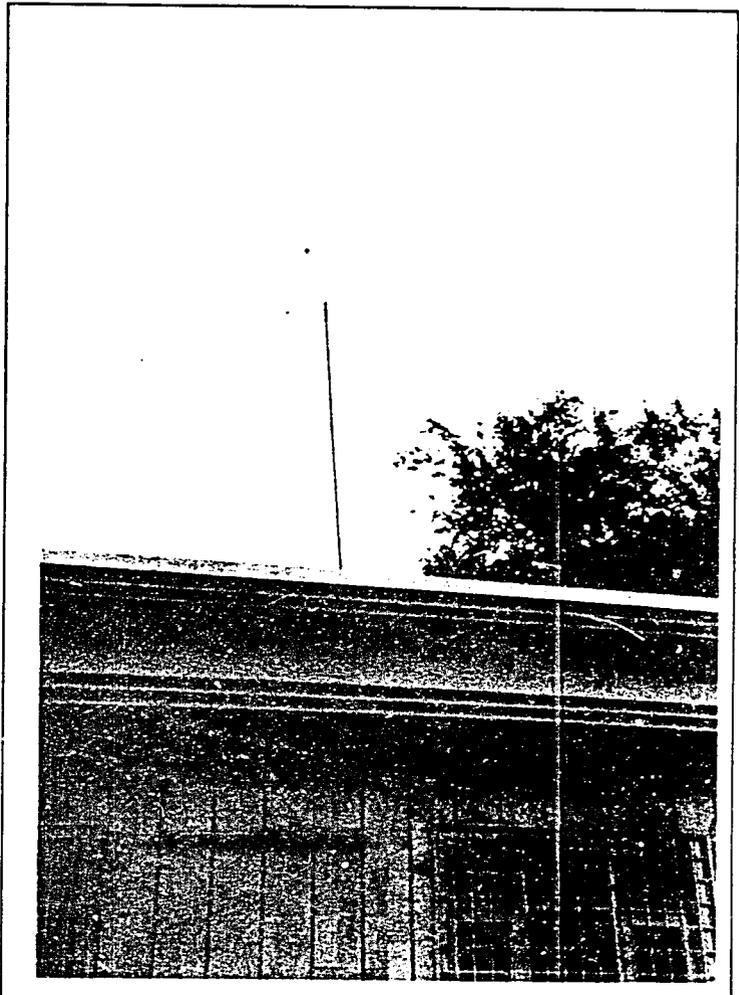


Figure 7 Peshawar AID/Rep Office Facility. VHF CommNet antenna installation atop Building No. 1.

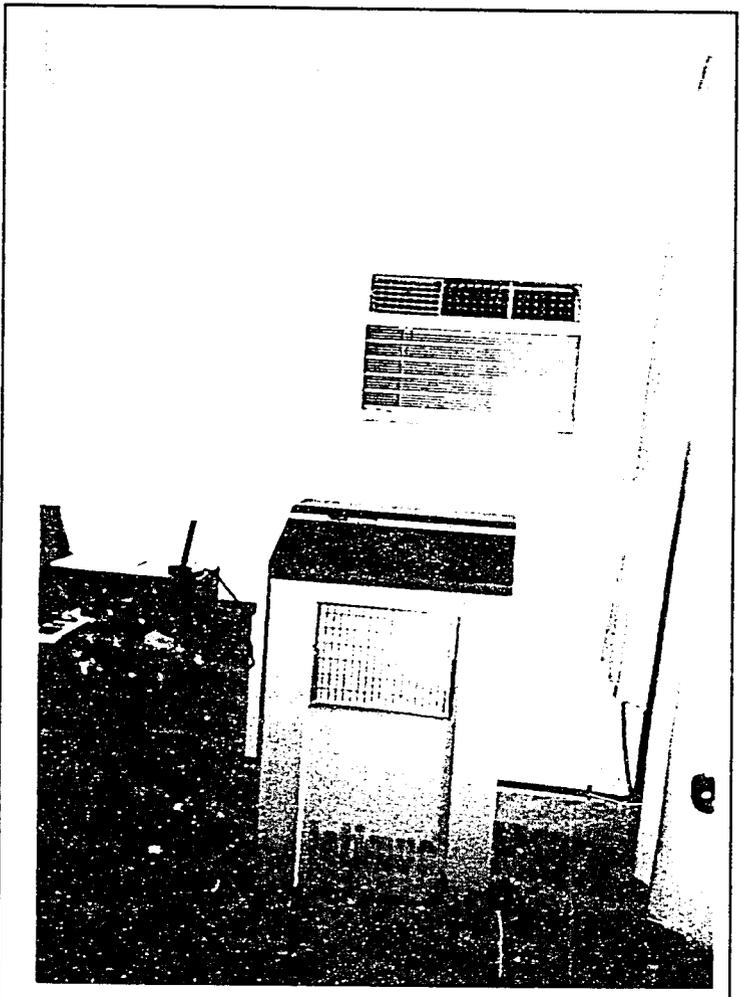


Figure 8 Peshawar AID/Rep Office Facility. Building No. 1, VHF radio room. Proposed site for the BSAA equipment.

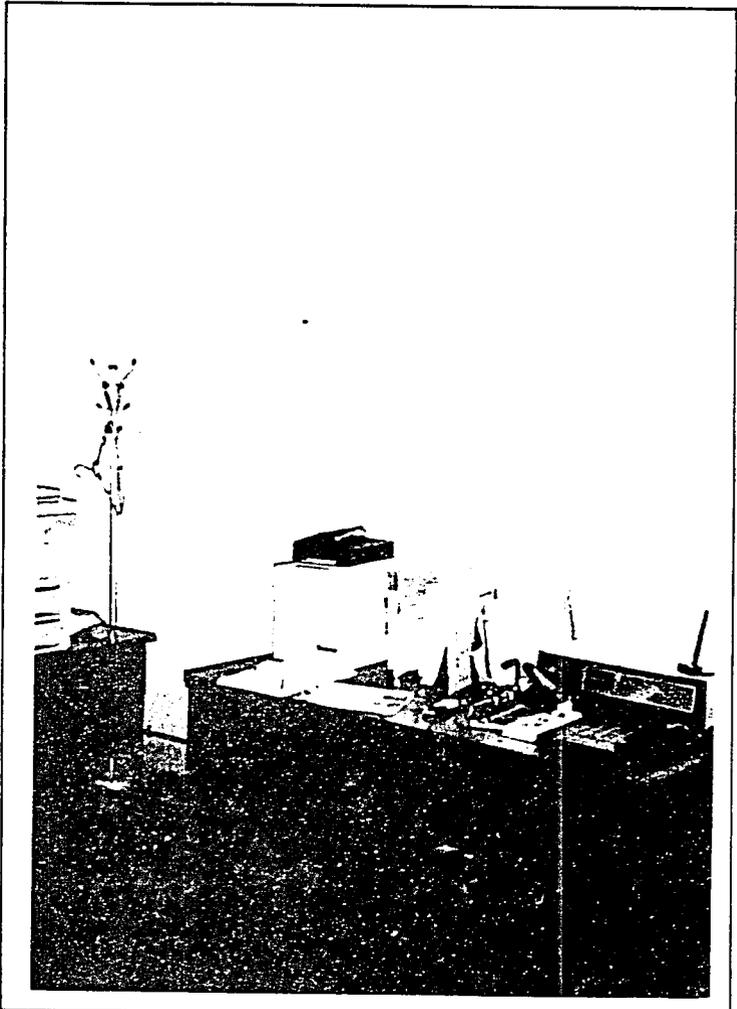


Figure 9 Peshawar AID/Rep Office Facility. Building No. 1 Radio Room. Proposed location for the BSAA equipment.

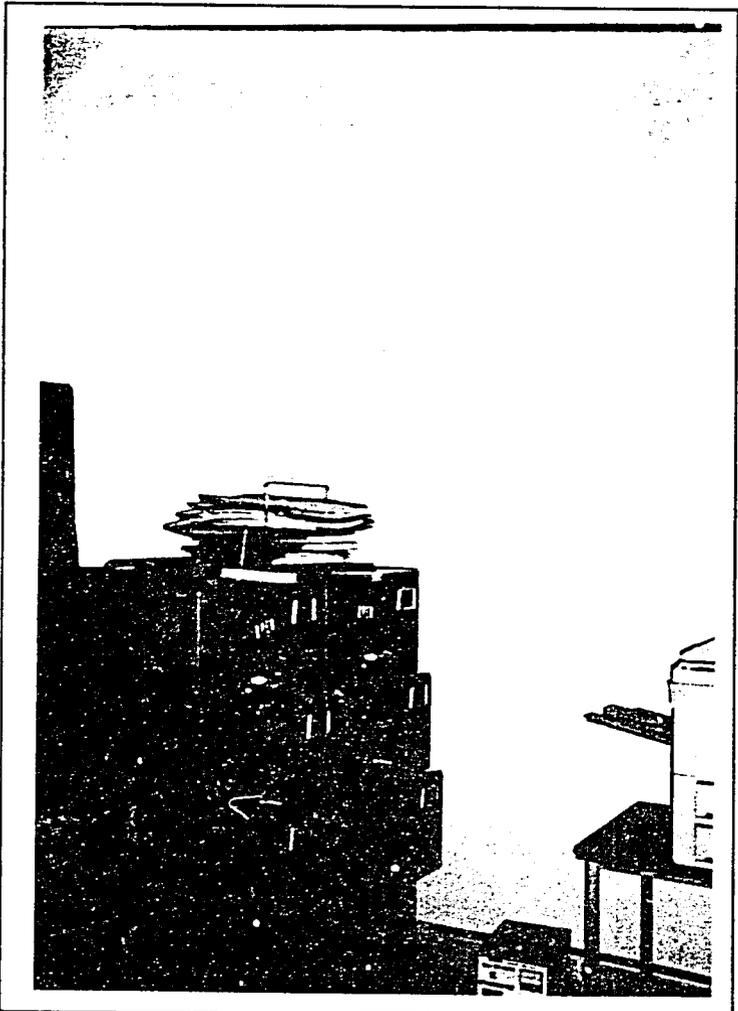
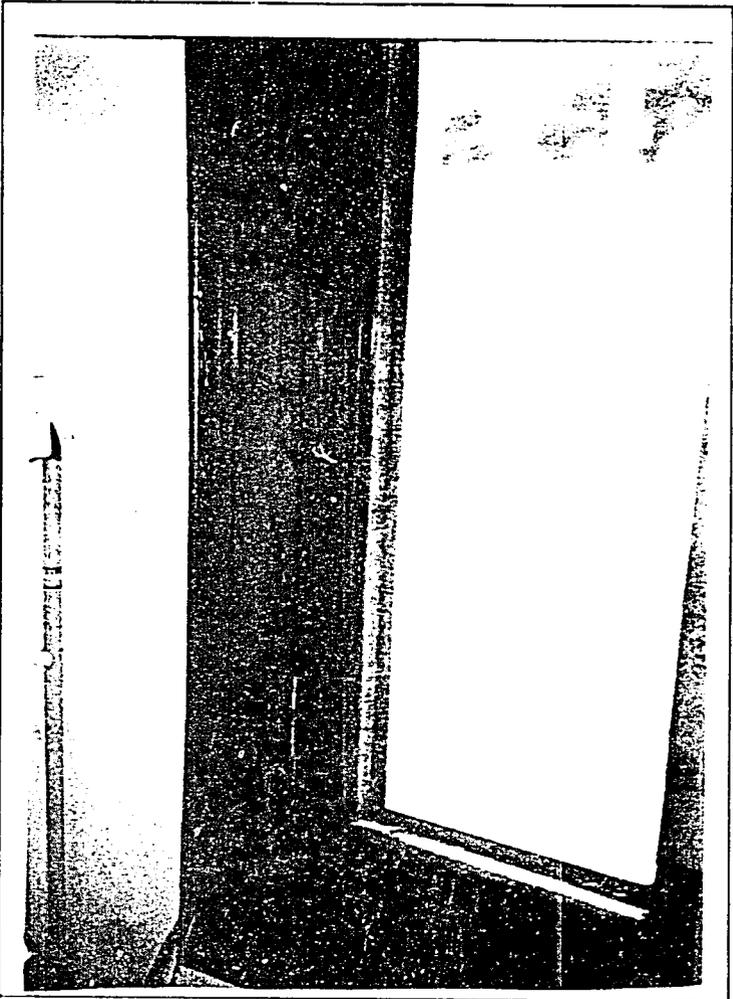


Figure 10 Peshawar AID/Rep Office Facility. Building No. 1 Radio Room.



**Figure 11** Peshawar AID/Rep Office Facility. Building No. 1 Radio Room. VHF coaxial cable exit through window frame. Same path for UHF coaxial cable.



**Figure 12** Peshawar AID/Rep Office Facility. View of TDY Room from AID/Rep's Office. Phone No. 3 to be installed in TDY Room.

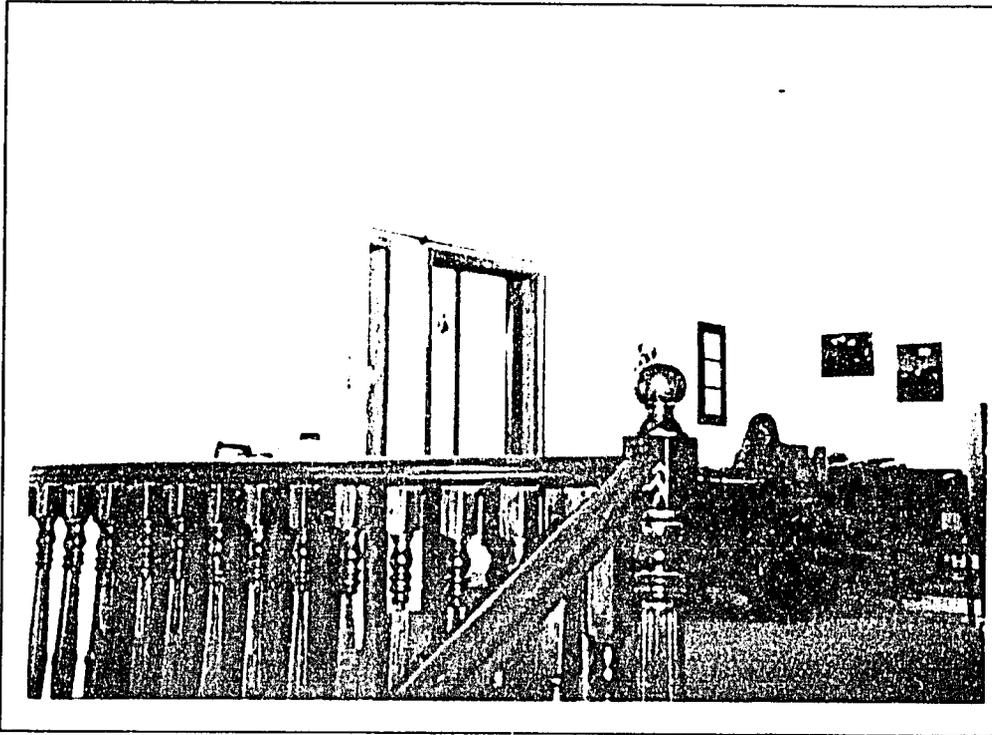


Figure 13 Peshawar AID/Rep Office Facility. AID Rep's office (left hand door frame) viewed from landing in front of TDY Room. Phone No. 2 to be placed in adjacent office.

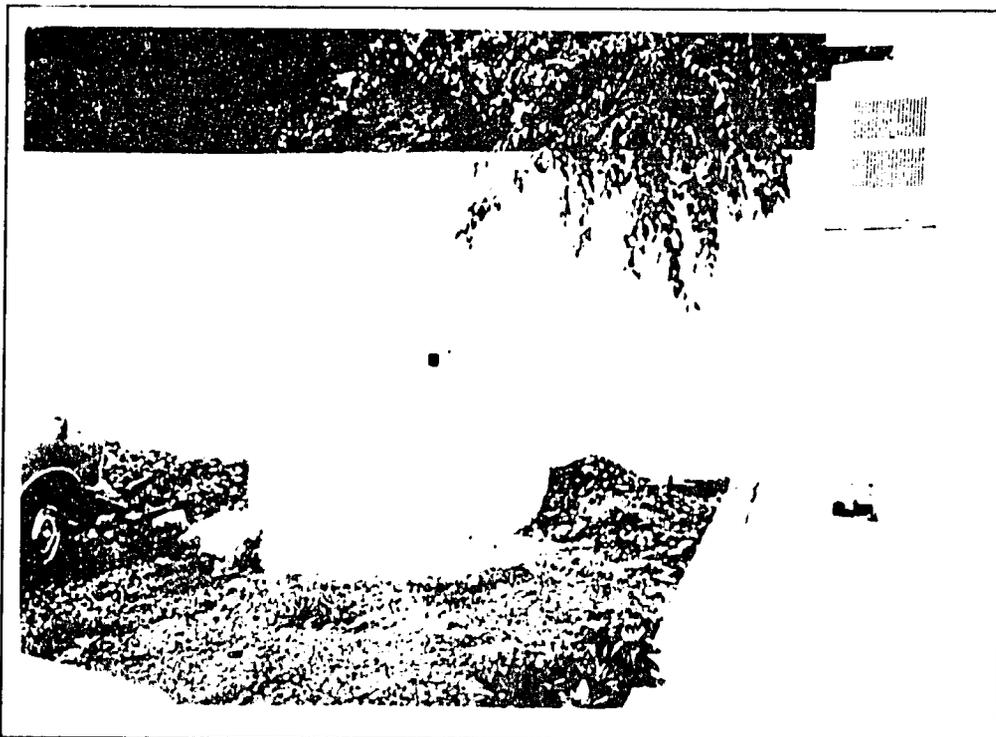
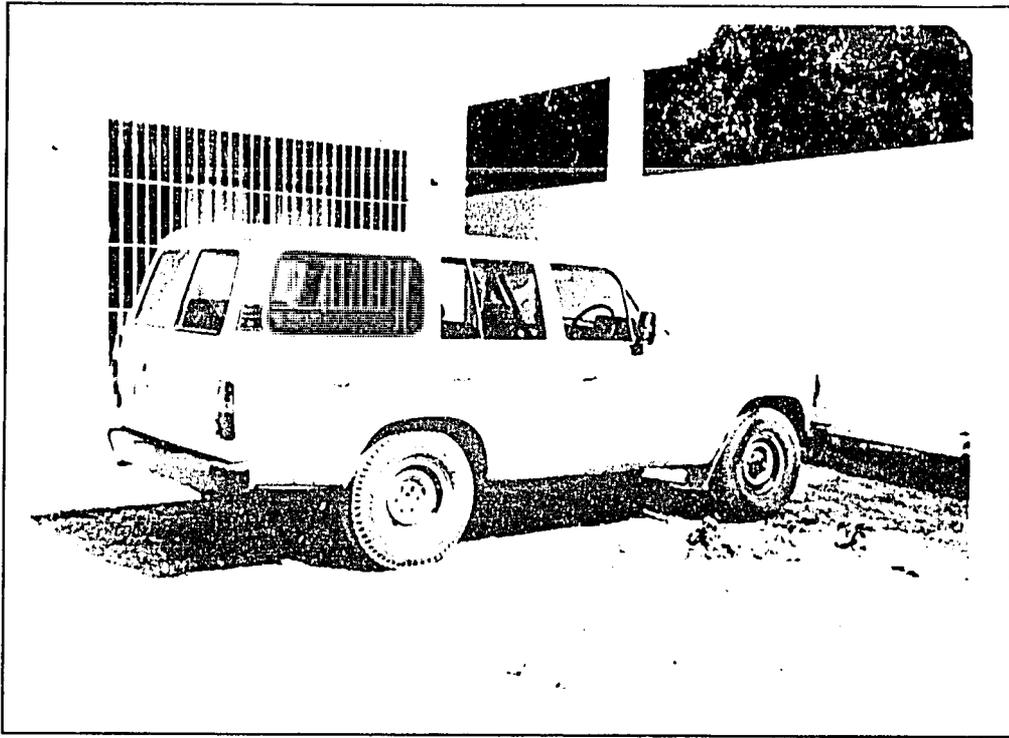
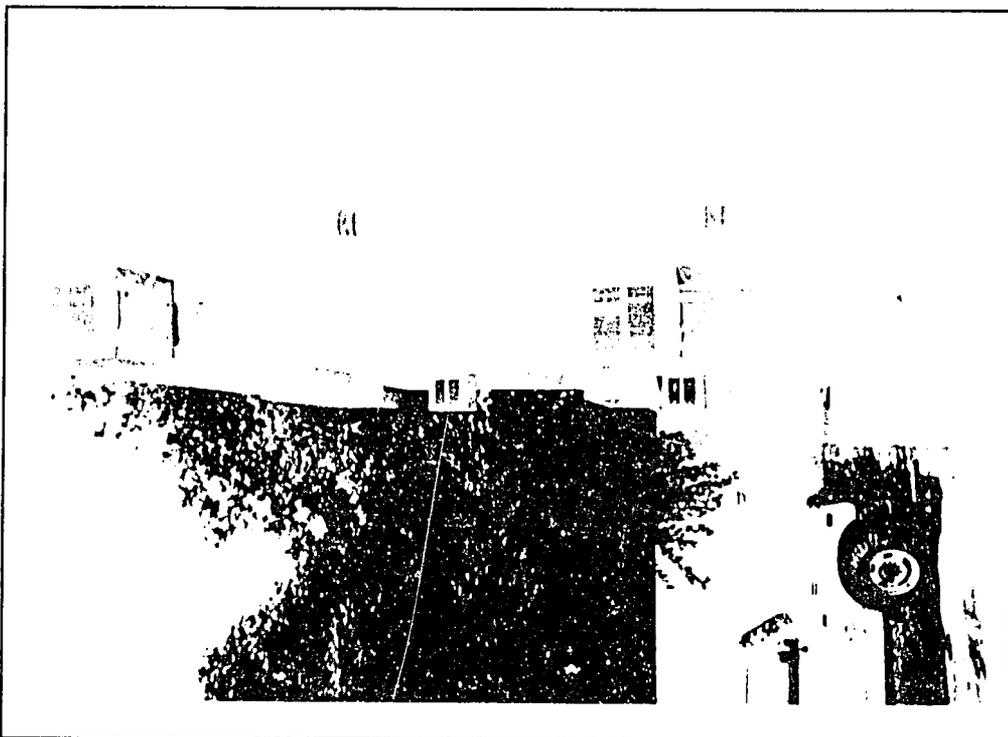


Figure 14 Peshawar AID/Rep Office Facility. View of well behind Building No. 1. Proposed tower to be located in front of well.

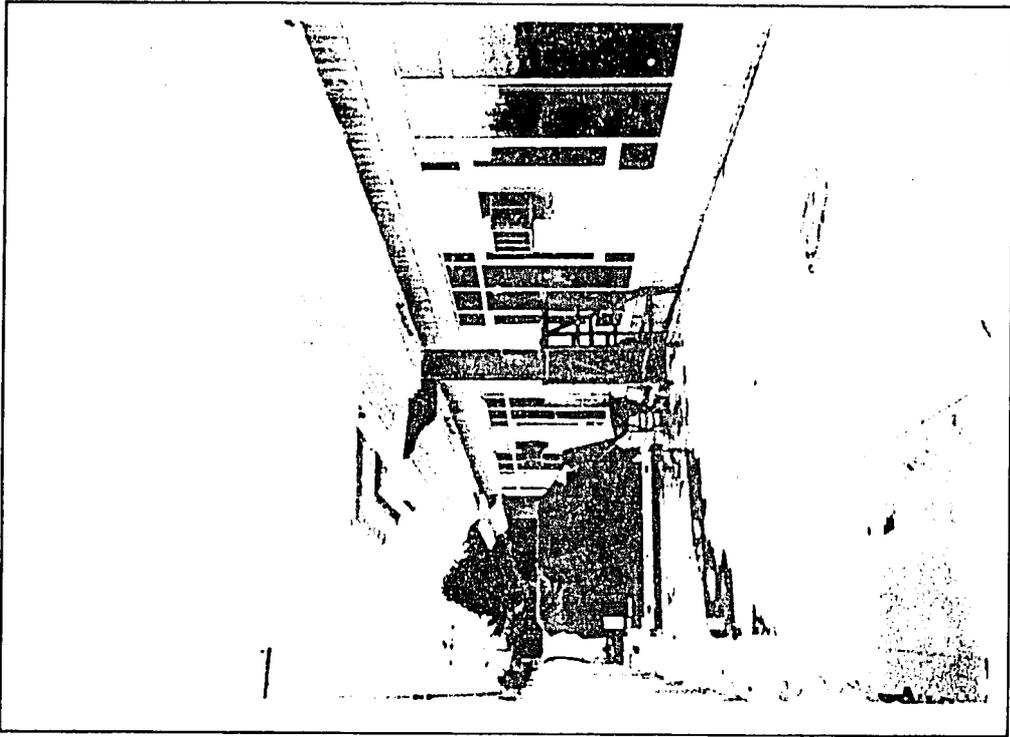


**Figure 15** Peshawar AID/Rep Office Facility. AID Toyota Land Cruiser.

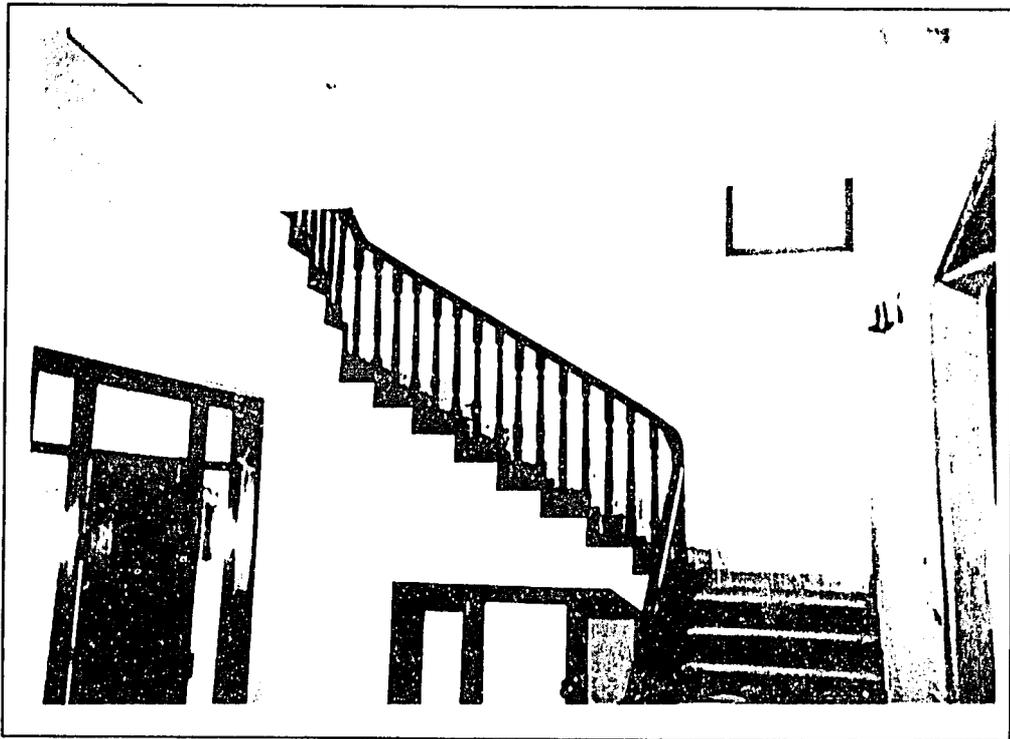


**Figure 16** Peshawar AID/Rep Office Facility. View of rear portion of Building No. 1. Tower to be located approximately where vehicle is located.

Site Photographs



**Figure 1** Peshawar HRD Office Facility. Front section of office. Note area is completely tiled. Generator to be installed between buildings.



**Figure 2** Peshawar HRD Office Facility. Staircase East End of Building.

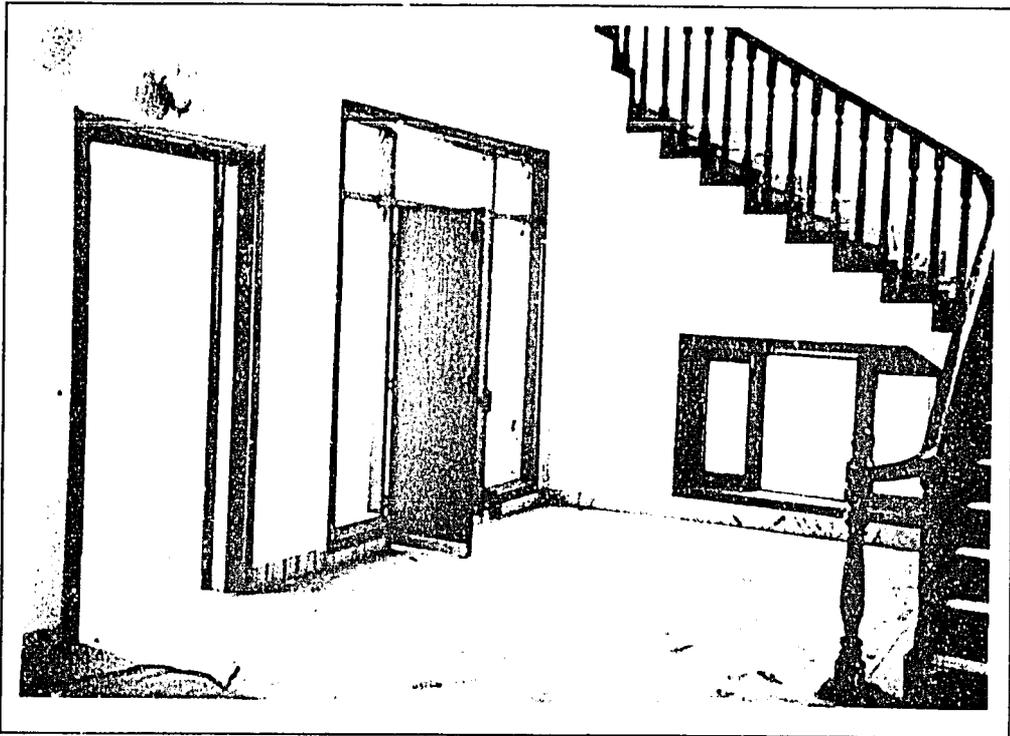


Figure 3 Peshawar HRD Office Facility. East End of Building, Main Entrance.

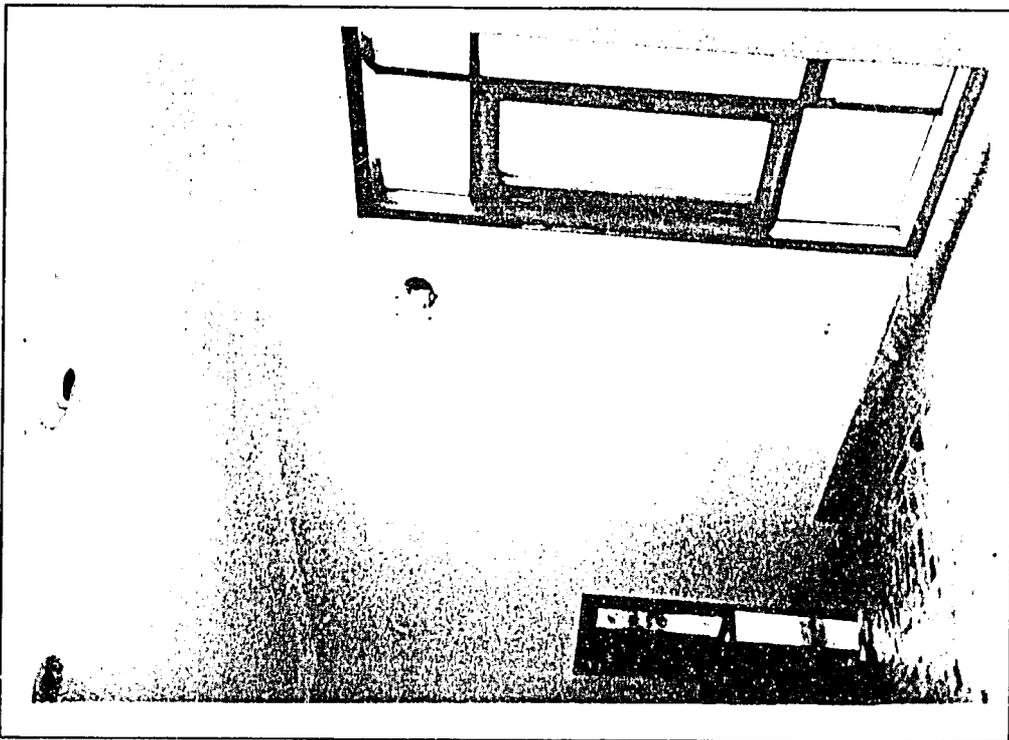
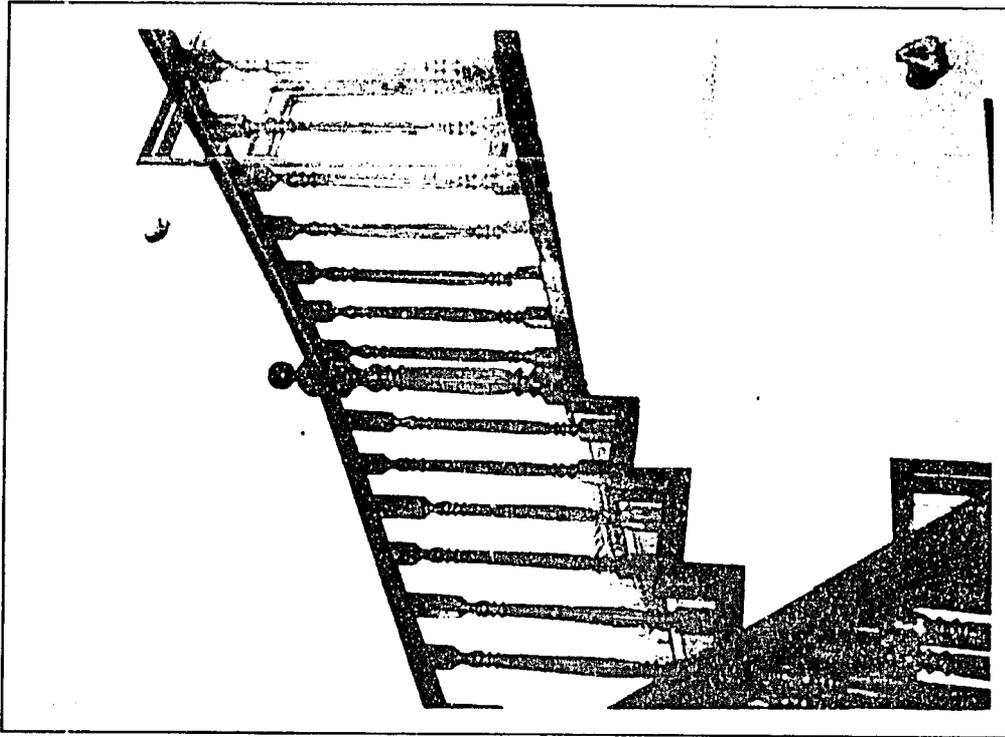
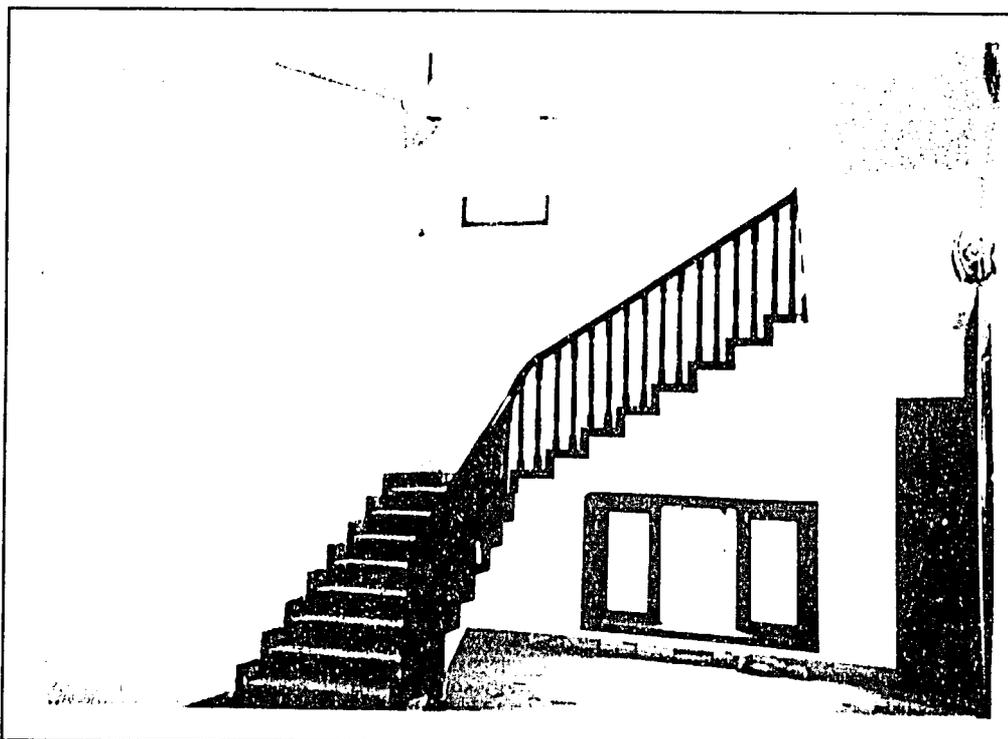


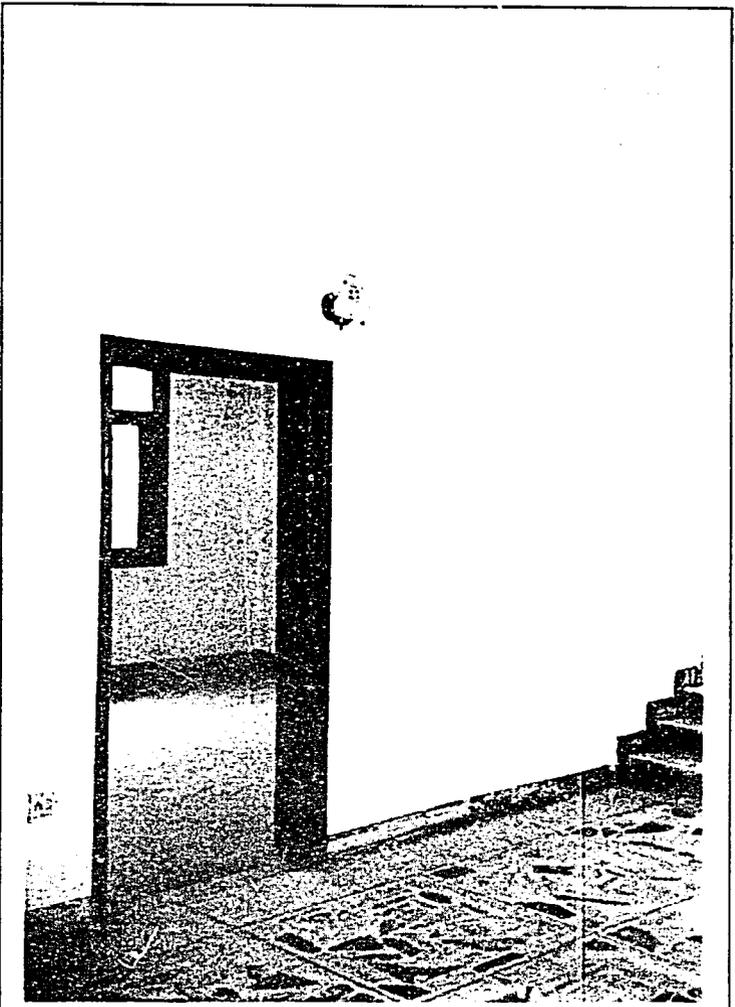
Figure 4 Peshawar HRD Office Facility. Mezzanine (left) to be equipped with Phone No. 2.



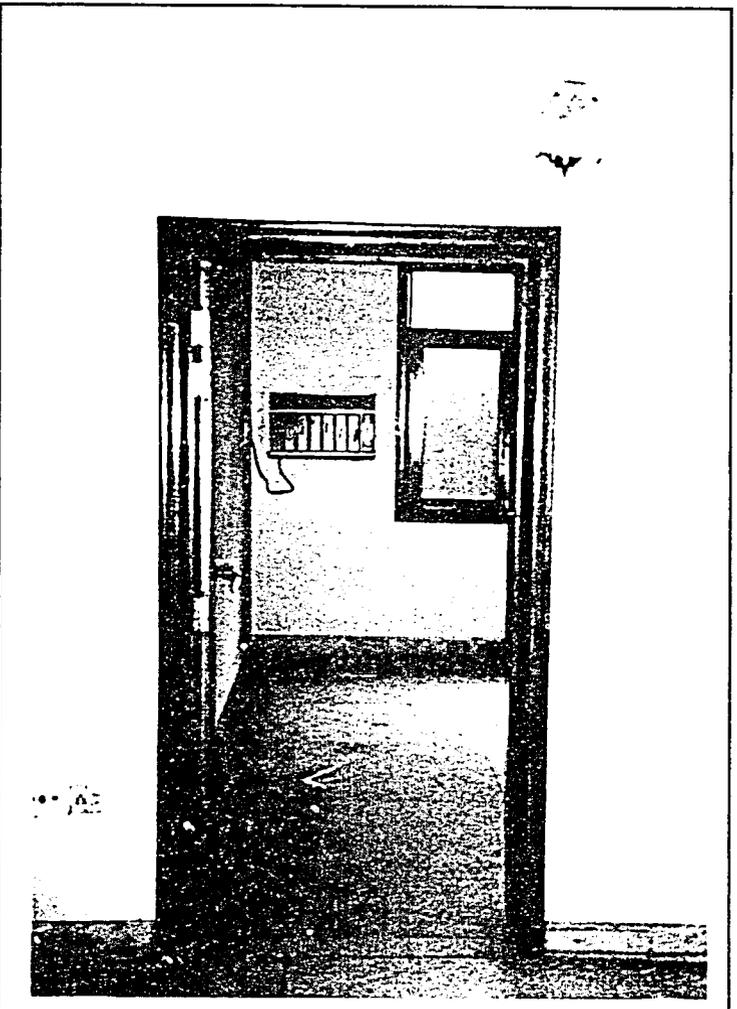
**Figure 5** Peshawar HRD Office Facility. Staircase in West end of building. Cable to Phone No. 3 to be routed down staircase to ground floor.



**Figure 6** Peshawar HRD Office Facility. West end of building, staircase. Run cable across bottom of last step, along floor to door frame.



**Figure 7** Peshawar HRD Office Facility. Doorway to office with Phone No. 3. Enter through frame or drill hole through wall.



**Figure 8** Peshawar HRD Office Facility. Entrance to office with Phone No. 3.

Site Photographs

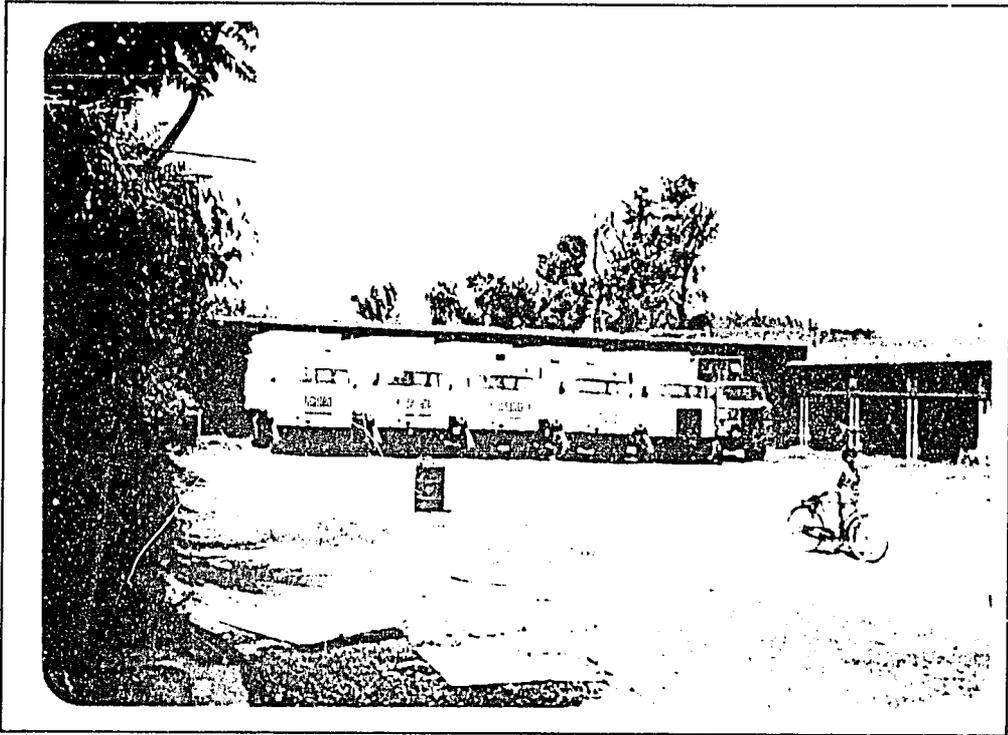


Figure 1 RONCO Nasir Pur Vehicle Maintenance Facility. (Facing West)

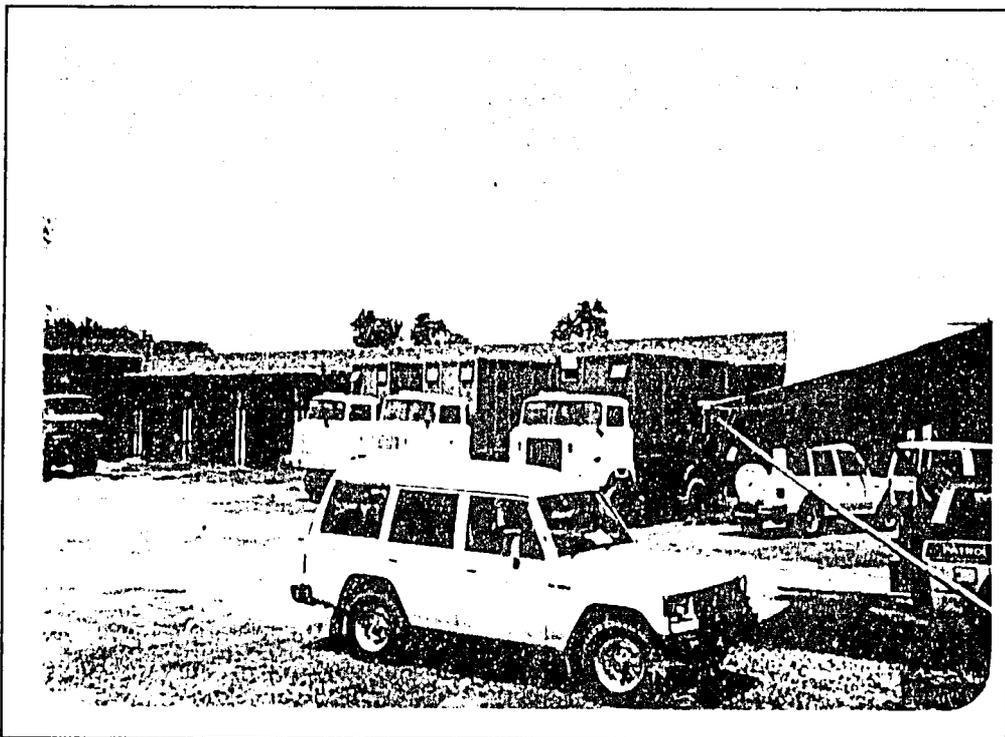


Figure 2 RONCO Nasir Pur Vehicle Maintenance Facility. Facing north northwest.

*Handwritten mark*

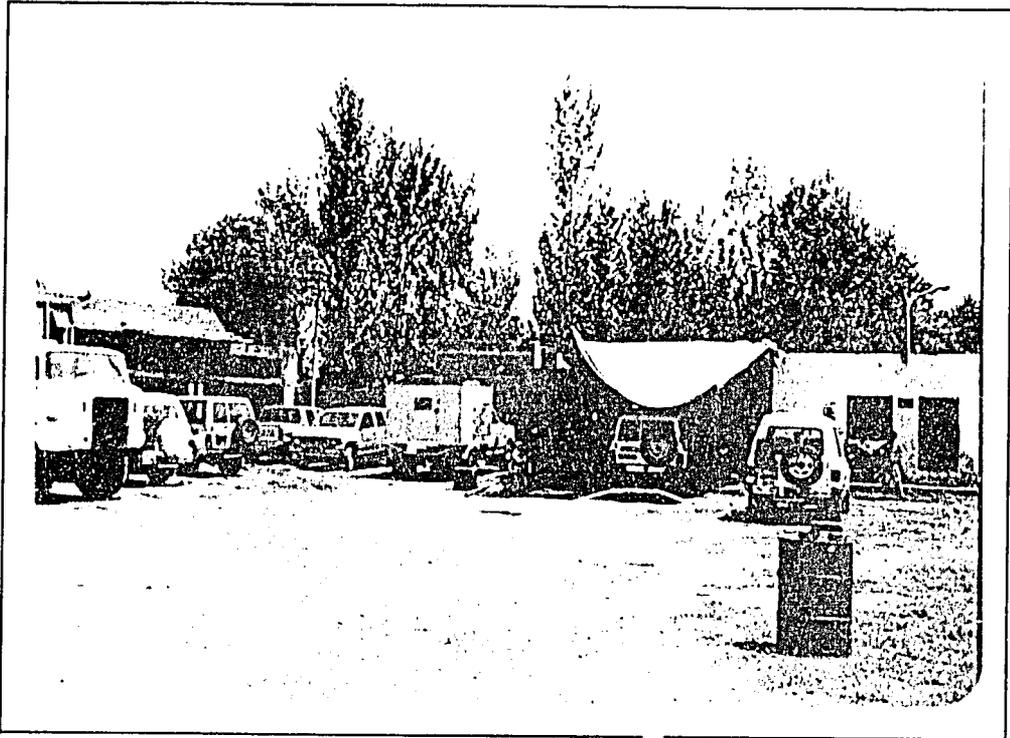


Figure 3 RONCO Nasir Pur Vehicle Maintenance Facility. Facing East. Vehicle maintenance is performed under tarpaulin.

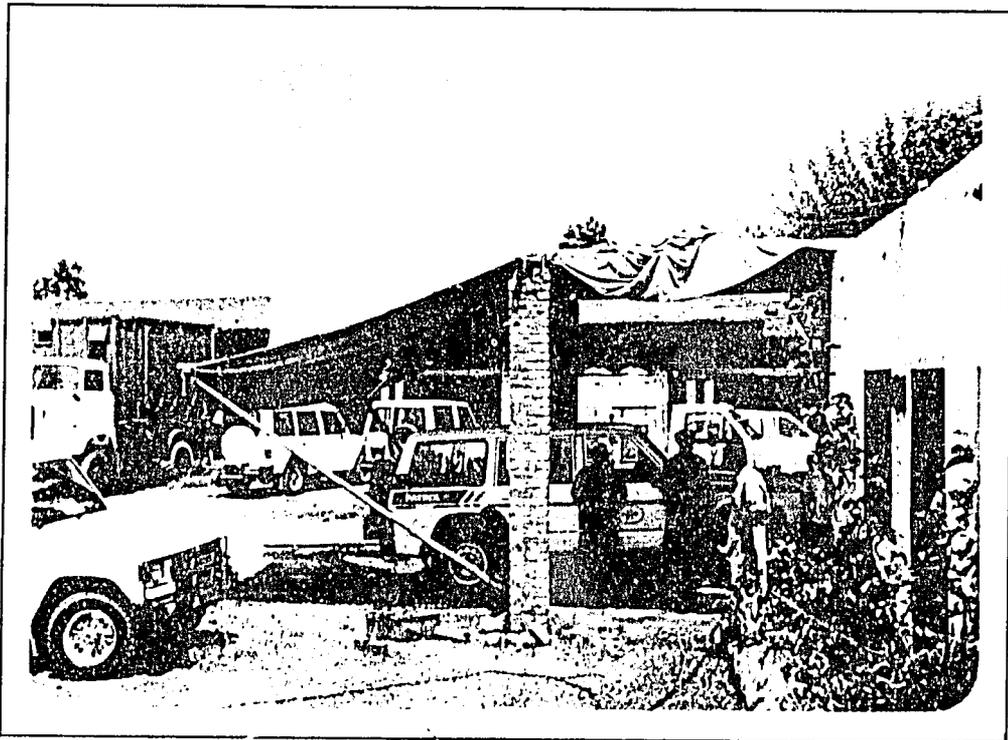


Figure 4 RONCO Nasir Pur Vehicle Maintenance Facility. Repair area, facing north.

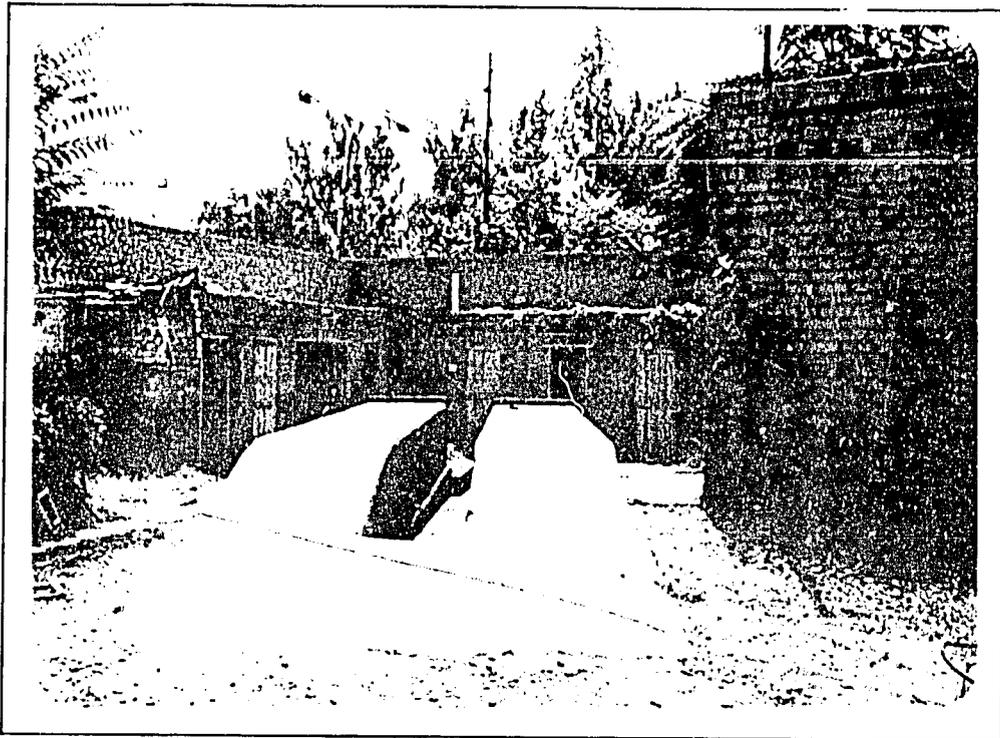


Figure 5 RONCO Nasir Pur Vehicle Maintenance Facility. Greasepit.

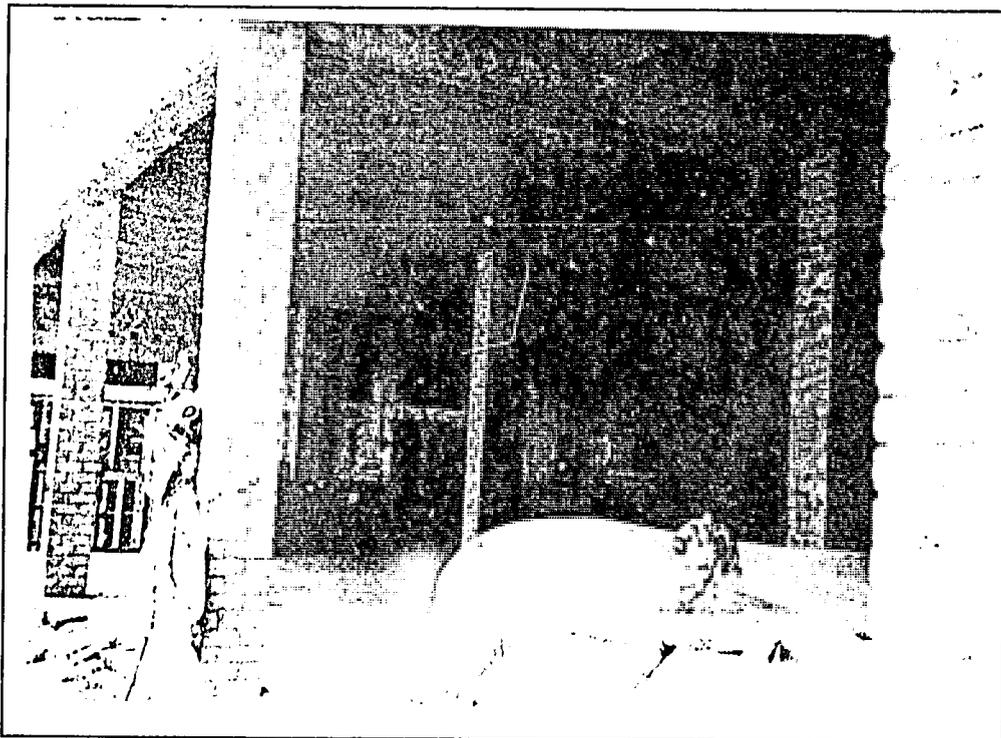


Figure 6 RONCO Nasir Pur Vehicle Maintenance Facility. Storage area at west end which can be used for mobile radio installations with some minor modifications. Area normally used to store grain.

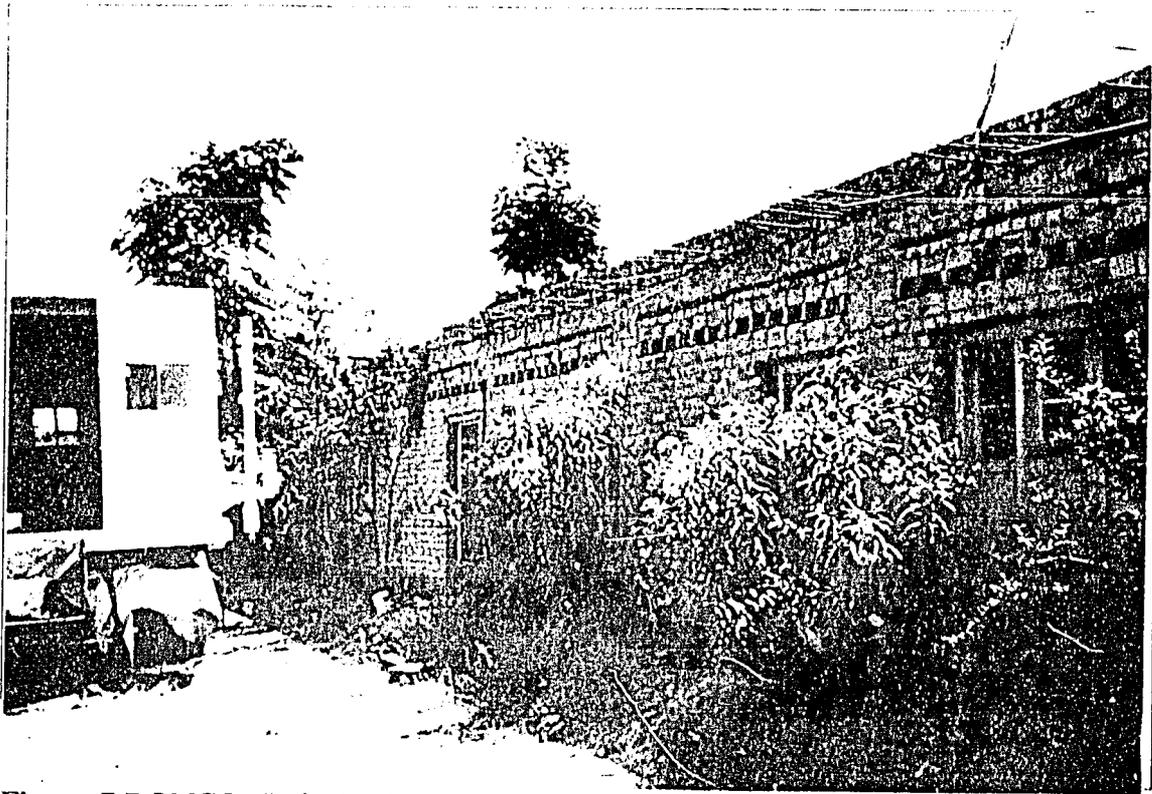


Figure 7 RONCO Nasir Pur Vehicle Maintenance Facility. Warehouse structure (facing North East).

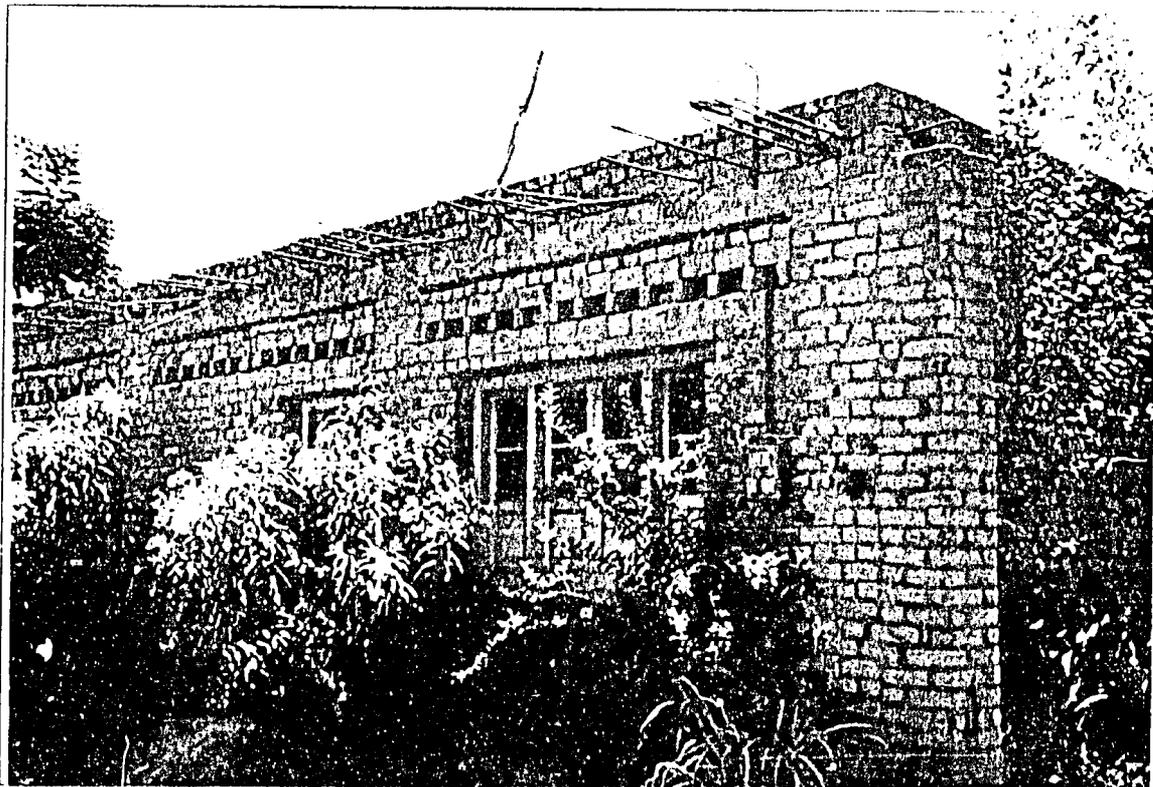


Figure 8 RONCO Nasir Pur Vehicle Maintenance Facility. Warehouse structure closeup.



Figure 9 RONCO Nasir Pur Vehicle Maintenance Facility. View of storage area to be used for vehicle mobile radio installations.

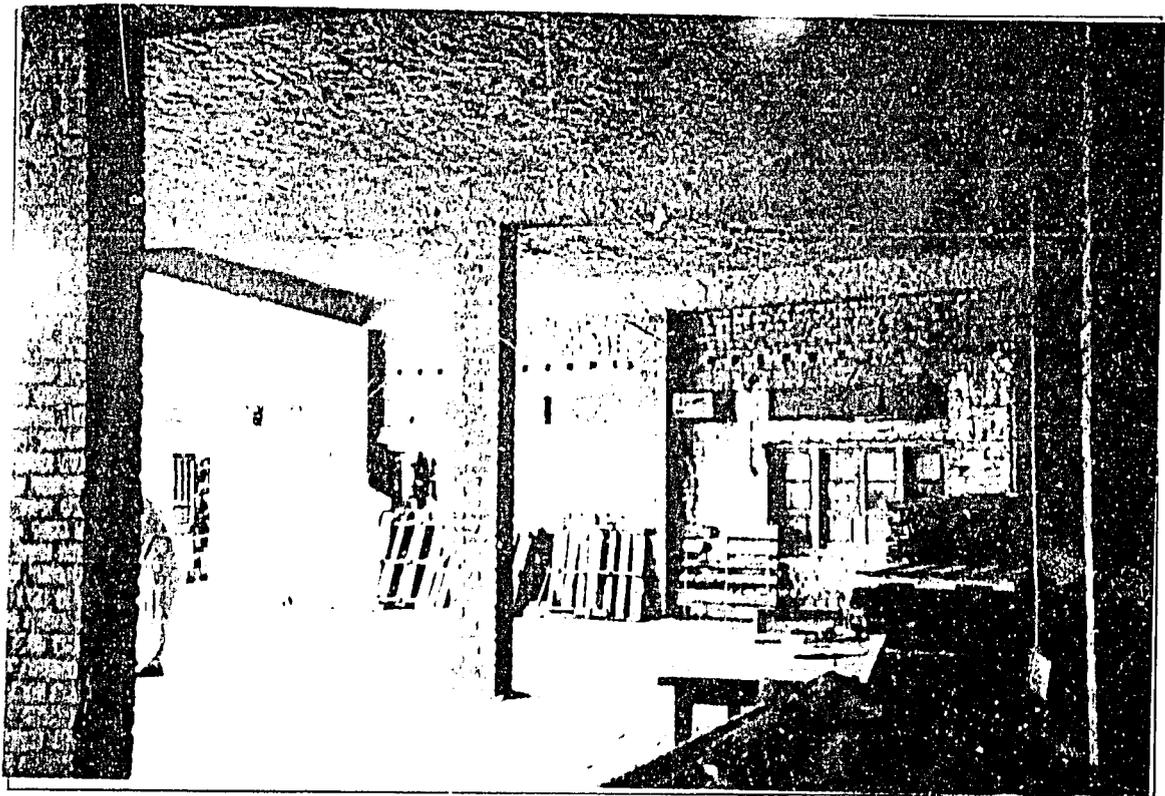


Figure 10 RONCO Nasir Pur Vehicle Maintenance Facility. View of vehicle installation stalls and warehouse area to be used for equipment storage.

Site Photographs

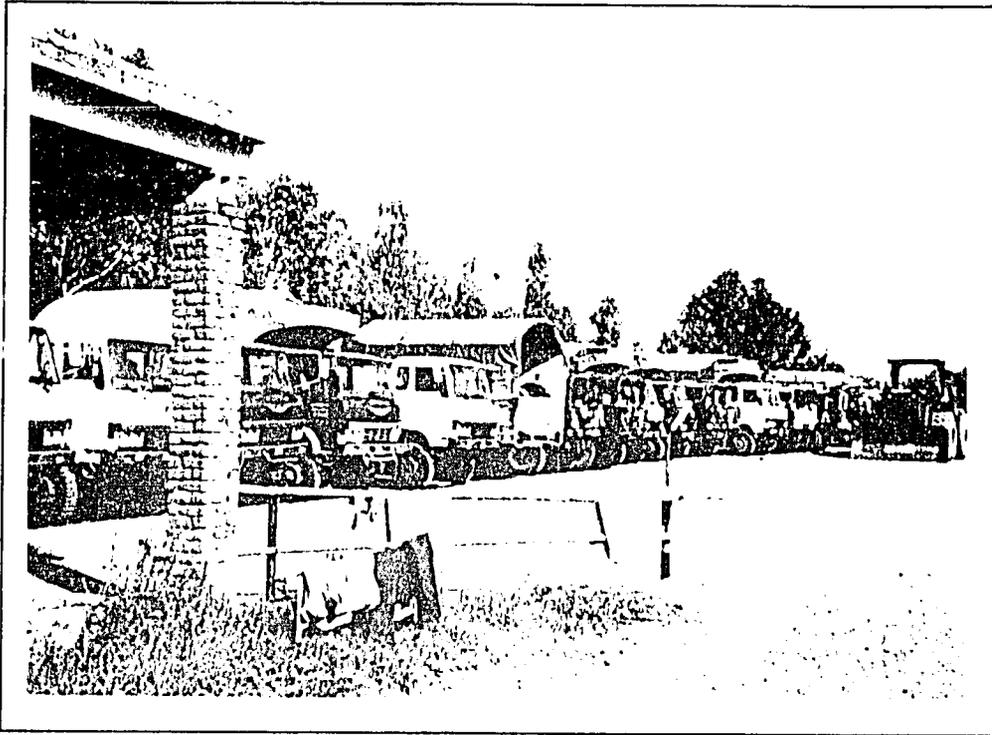


Figure 1 CCSC/ACLU Hyatabad Facility Entrance (Left).

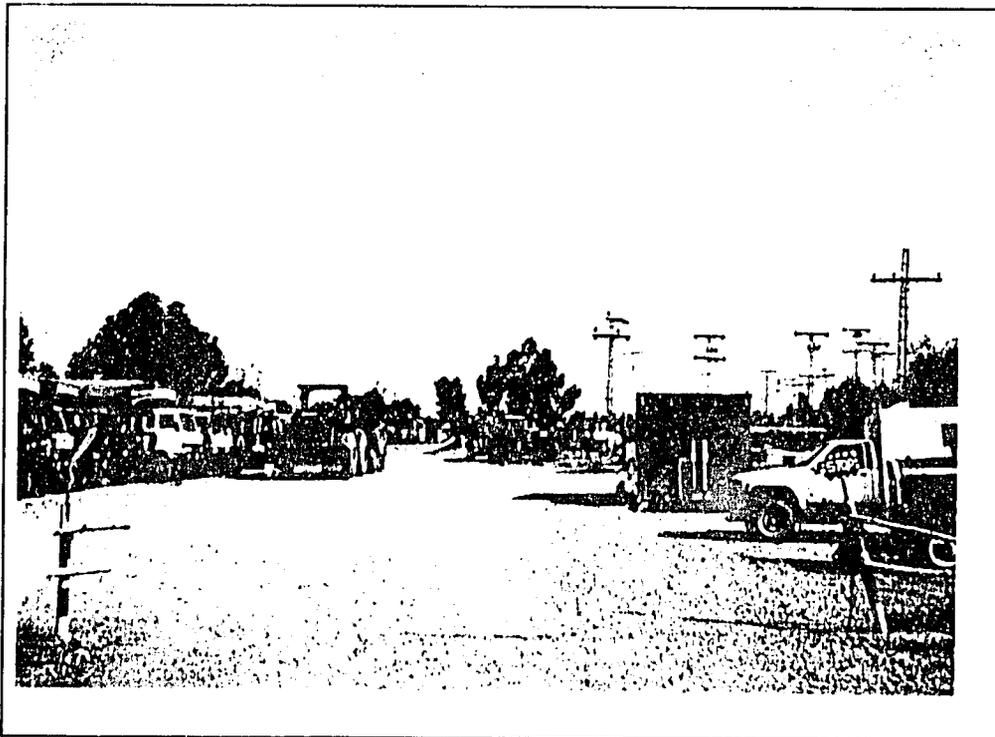


Figure 2 CCSC/ACLU Hyatabad Facility Entrance (Center).

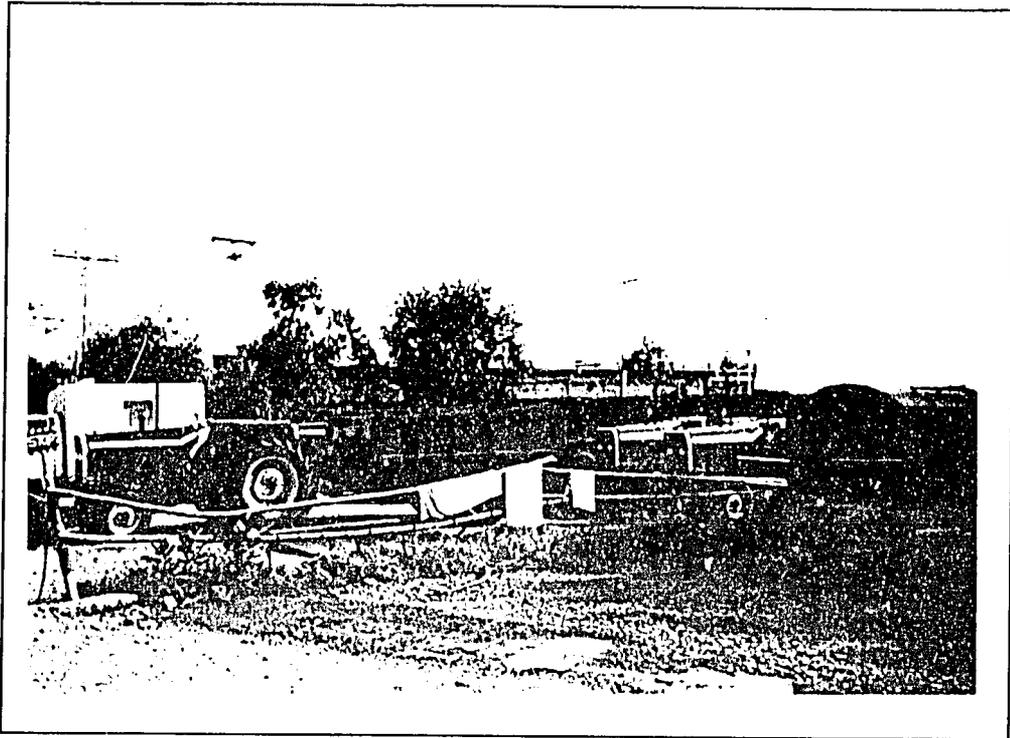


Figure 3 CCSC/ACLU Hyatabad Facility Entrance (Right).

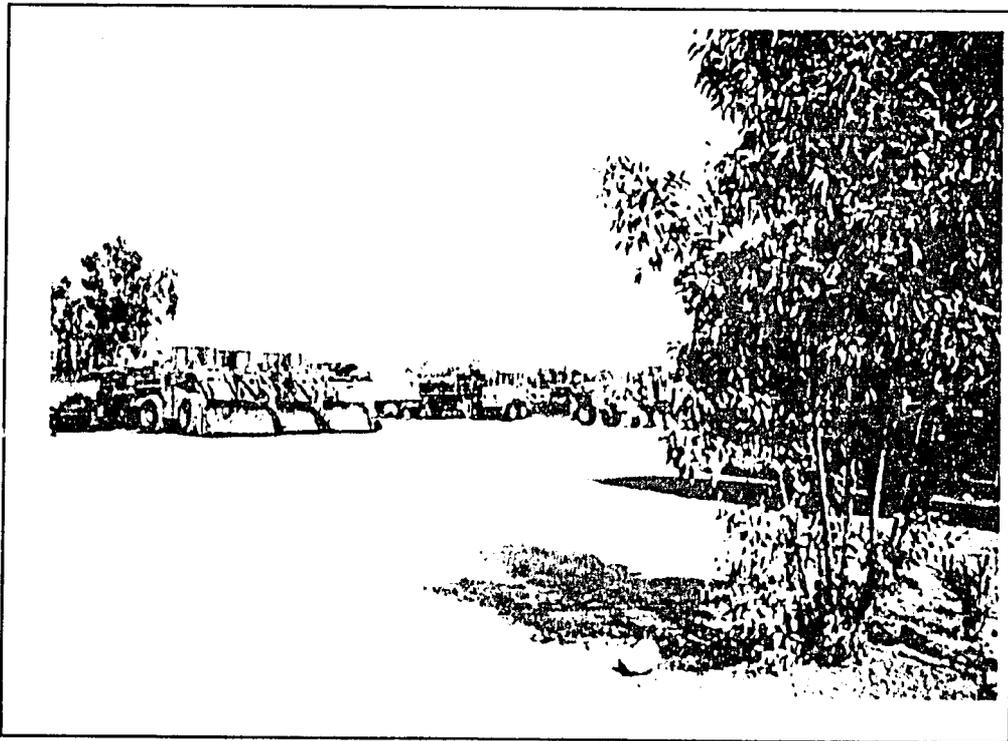


Figure 4 CCSC/ACLU Hyatabad Facility Equipment Yard.

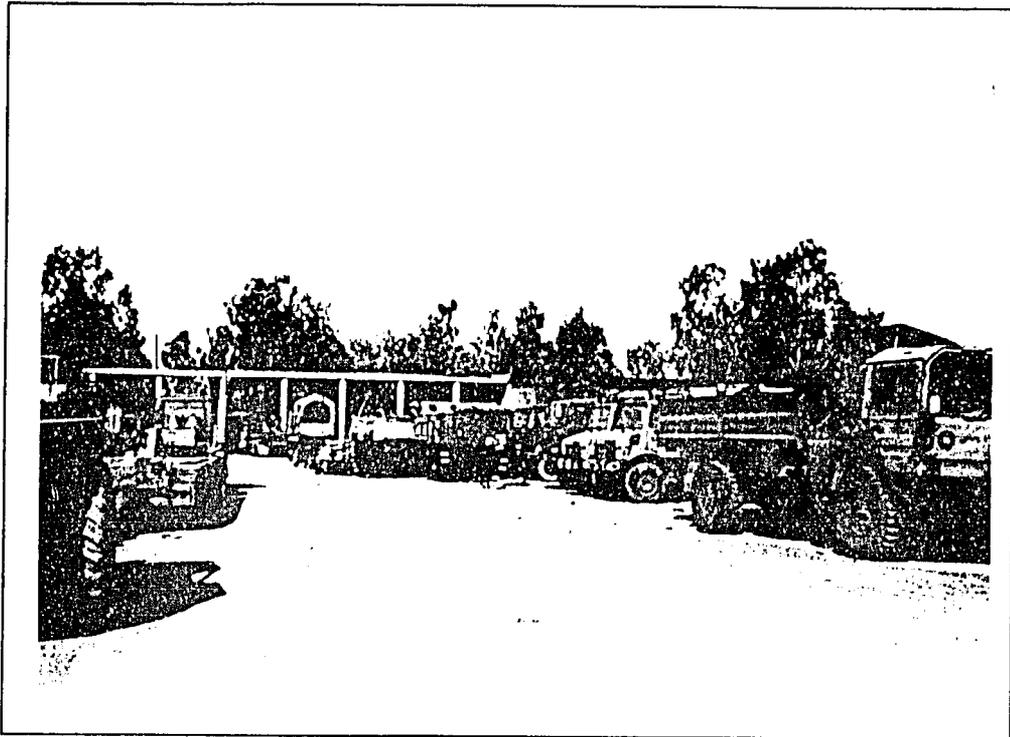


Figure 5 CCSC/ACLU Hyatabad Facility Equipment Yard.

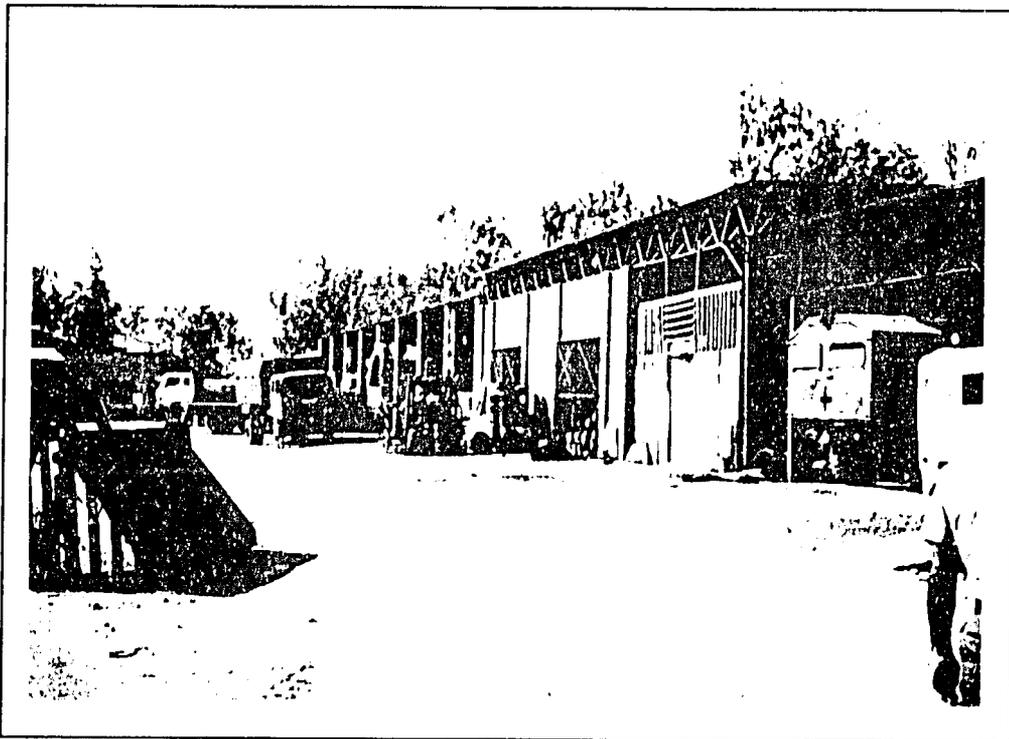


Figure 6 CCSC/ACLU Hyatabad Facility Maintenance Area.

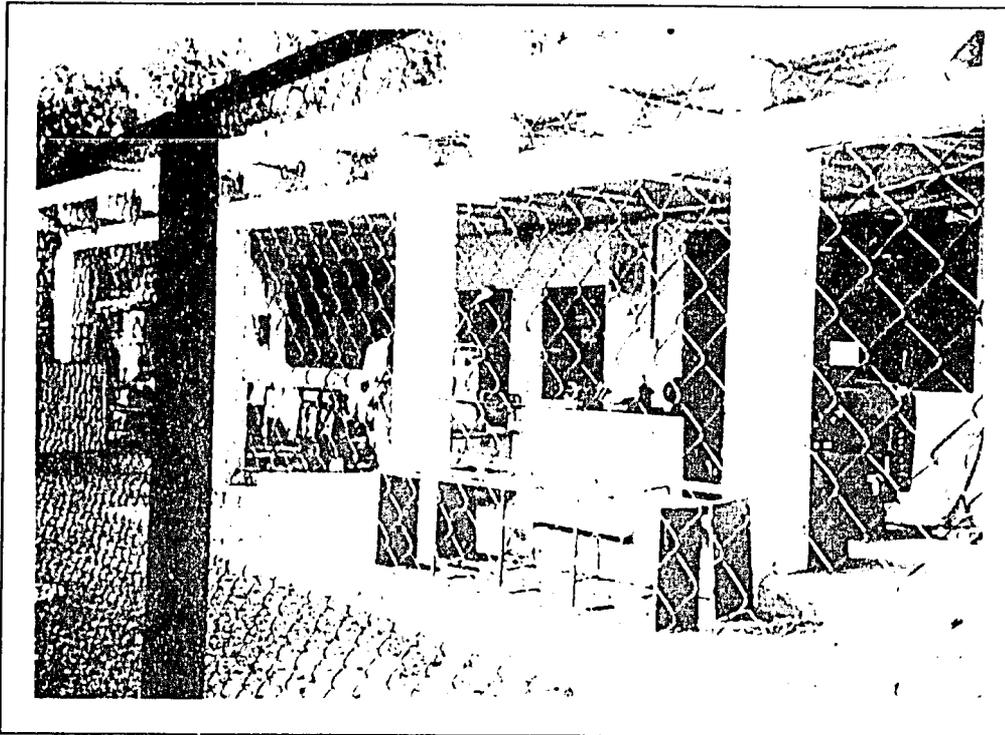


Figure 7 CCSC/ACLU Hyatabad Facility, Afghan Mechanical Training Section.



Figure 8 CCSC/ACLU Hyatabad Facility. Taken from atop building at entrance area.

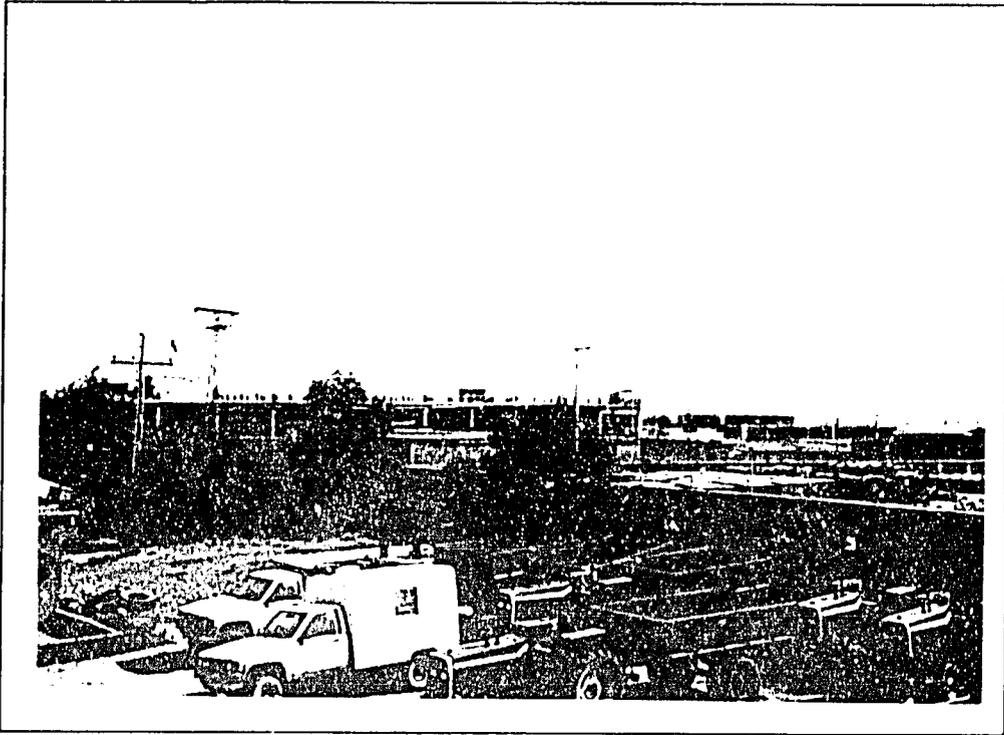


Figure 9 CCSC/ACLU Hyatabad Facility. Industrial park area east of the facility. Note electrical distribution lines.

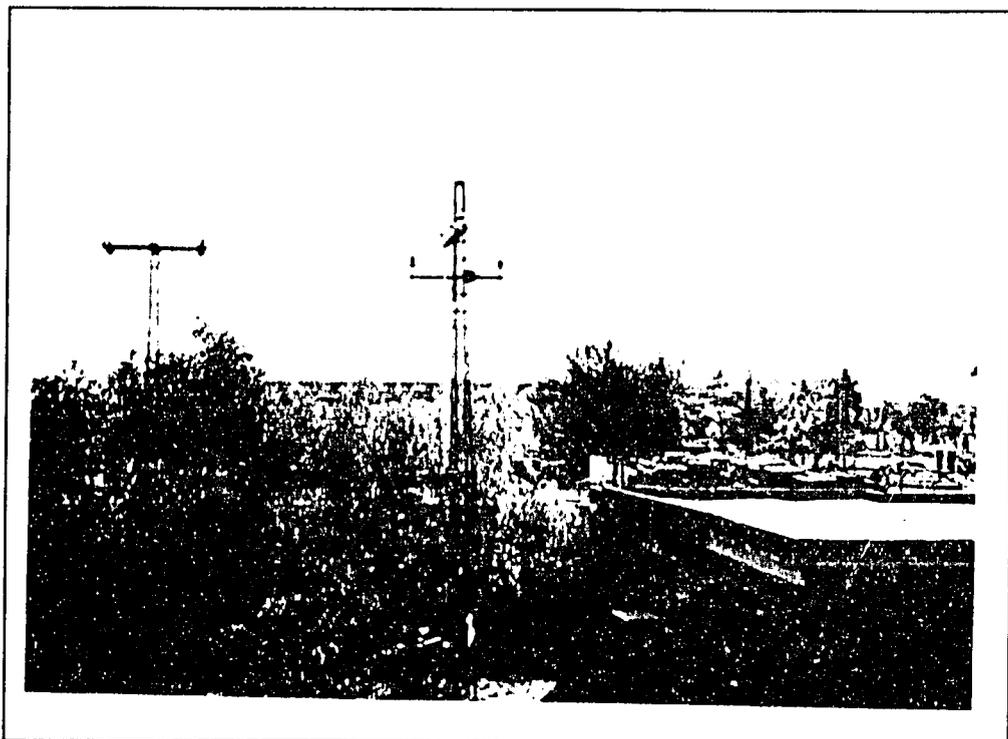


Figure 10 CCSC/ACLU Hyatabad Facility, electrical transmission lines to east of facility.

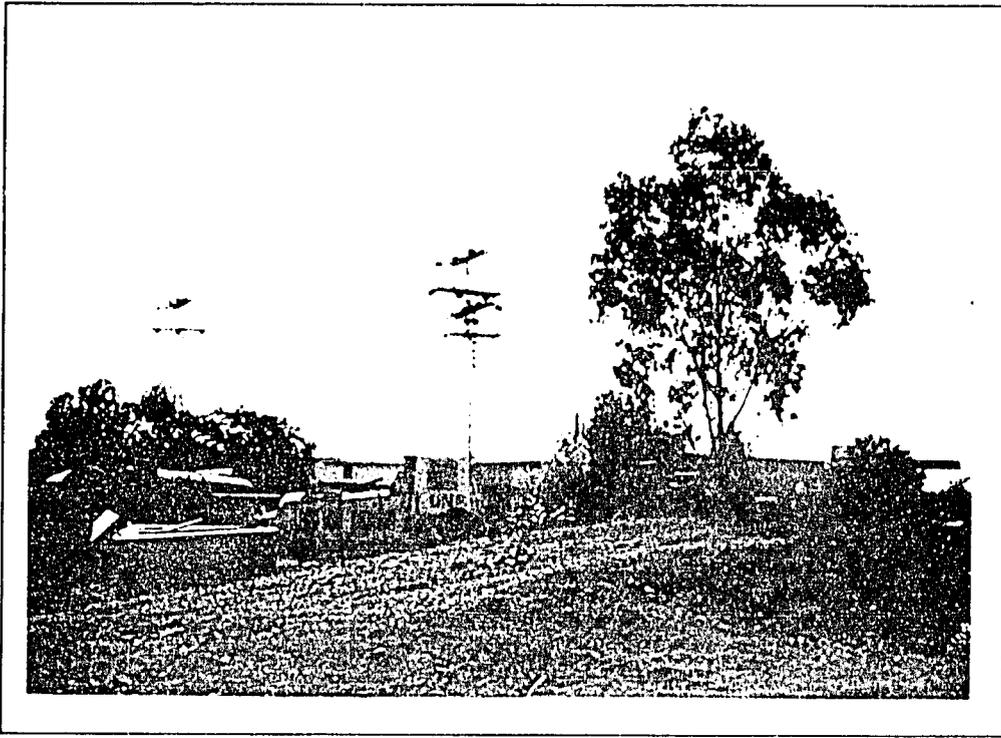


Figure 11 CCSC/ACLU Hyatabad Facility. Electrical distribution site to east of facility.

Site Photographs

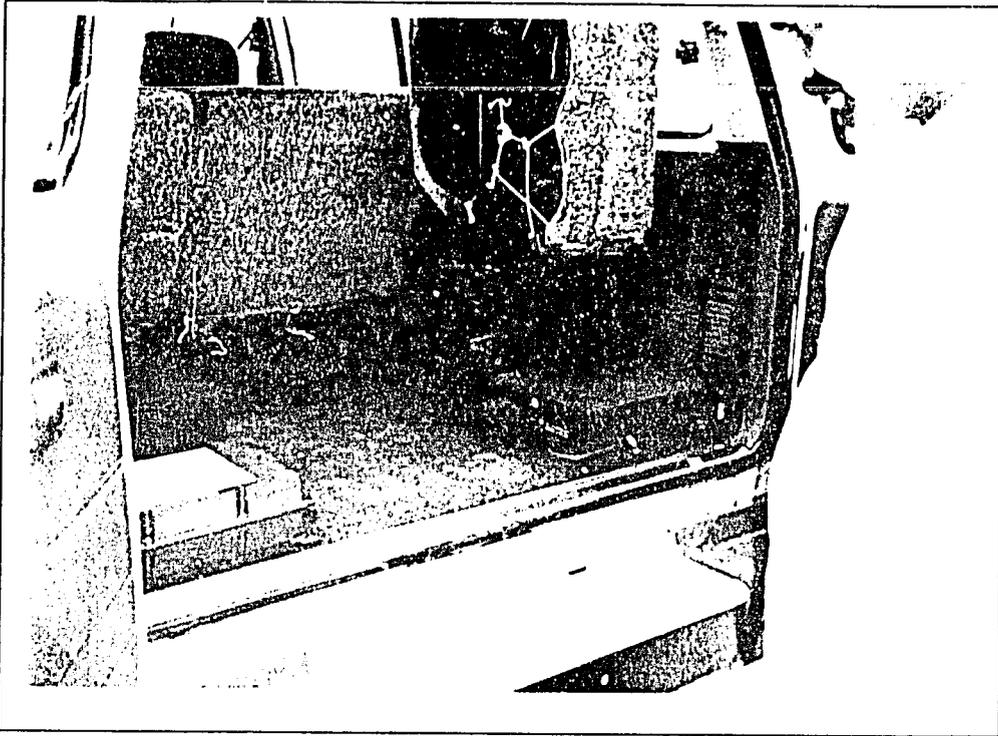


Figure 1 AID Pakistan HF Installation. Rear trunk mount, Motorola transceiver on right, tuner on left.

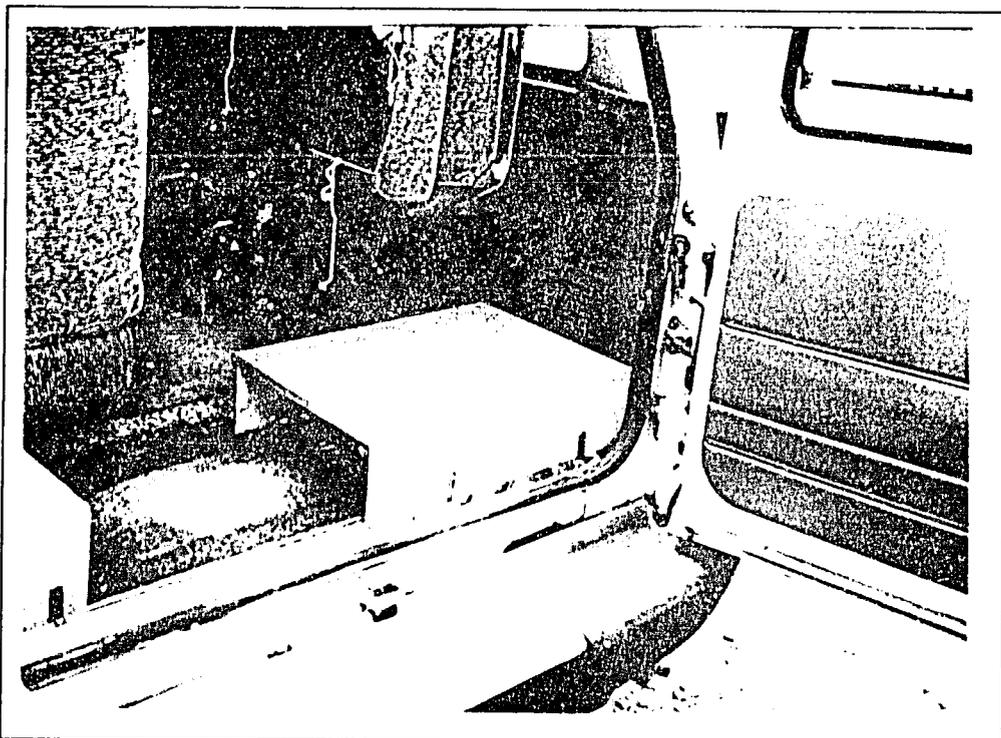


Figure 2 AID Pakistan HF Installation. Wooden cover for Motorola transceiver (right).

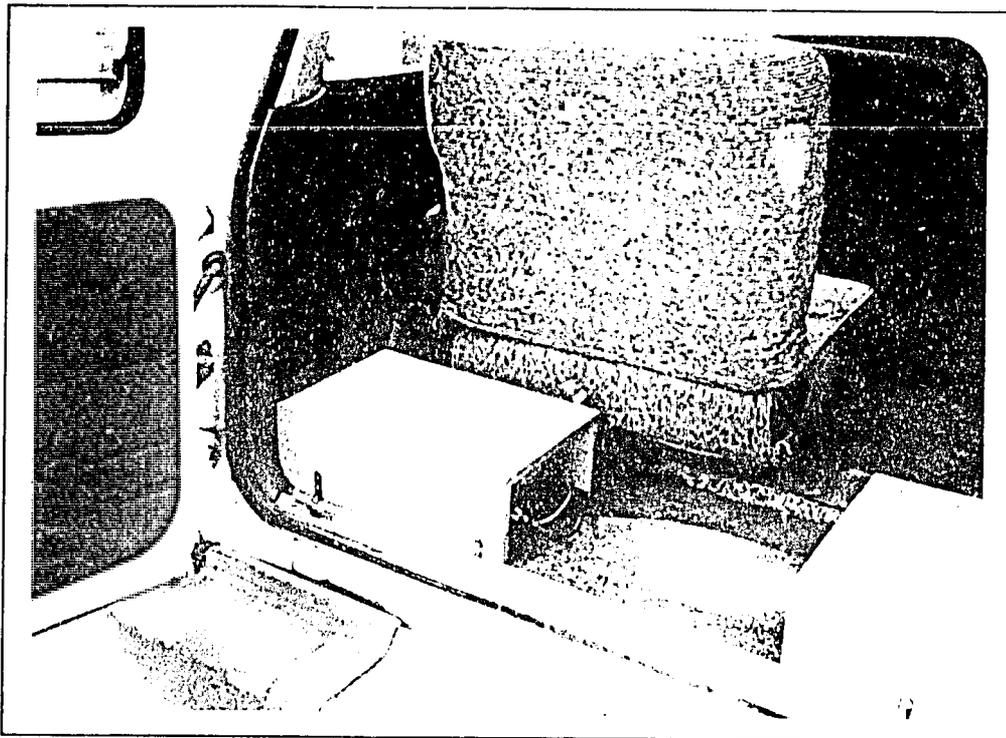


Figure 3 AID Pakistan HF Installation. Wooden cover for tuner.

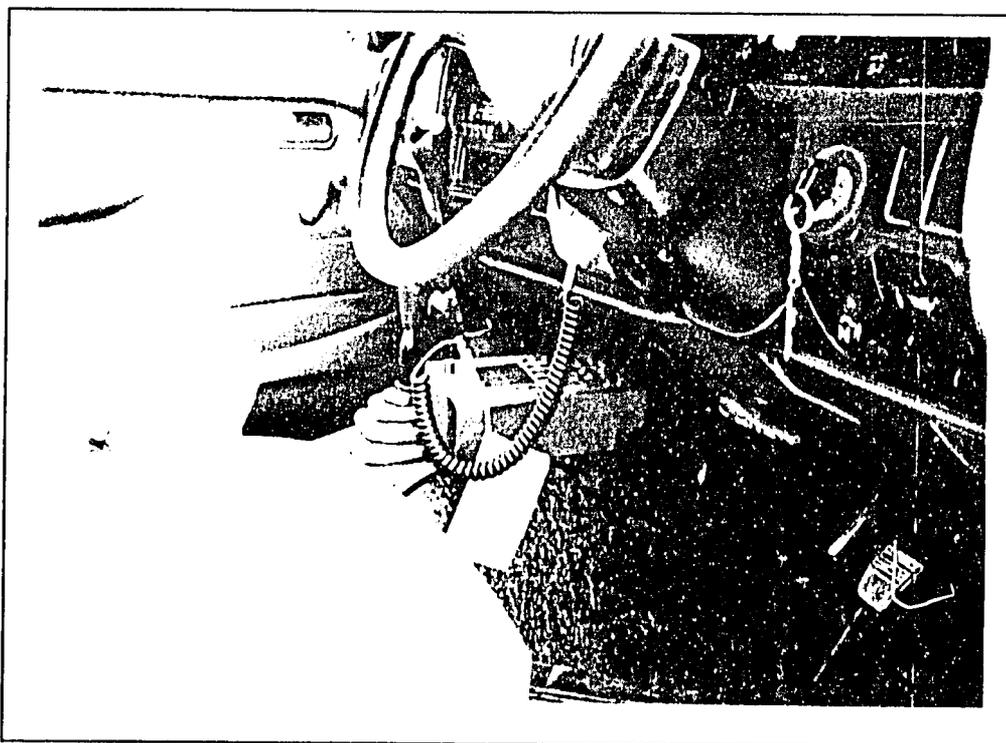


Figure 4 AID Pakistan HF Installation. Remote Control Head Installation.

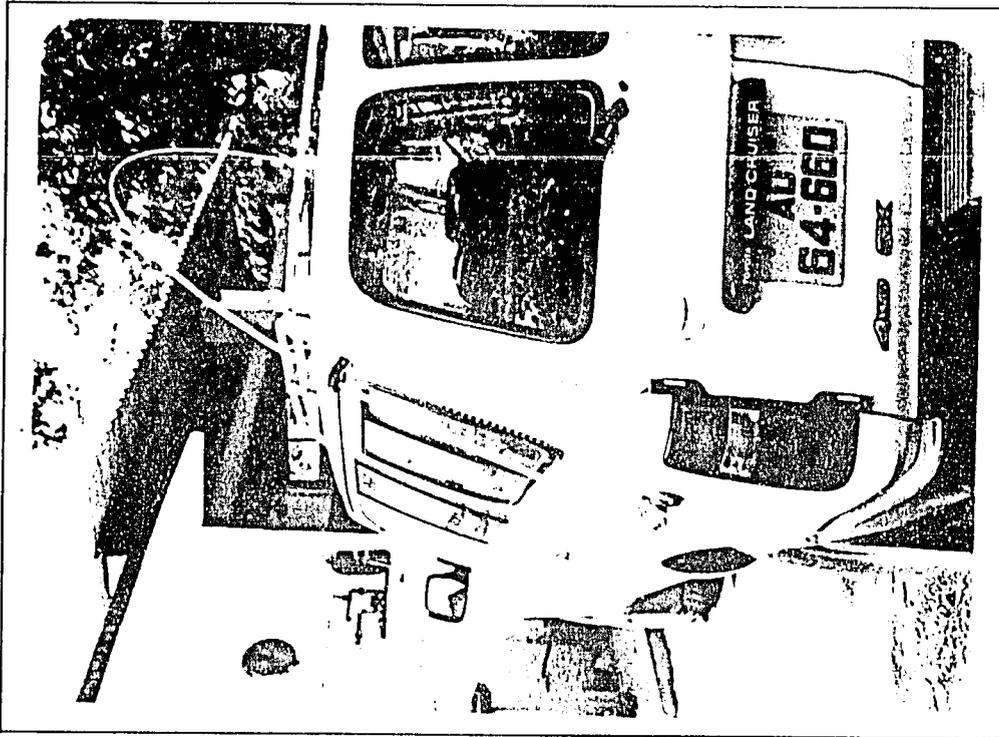


Figure 5 AID Pakistan HF Installation. Whip Antenna Installation. (Note insulator which is installed above antenna mount.

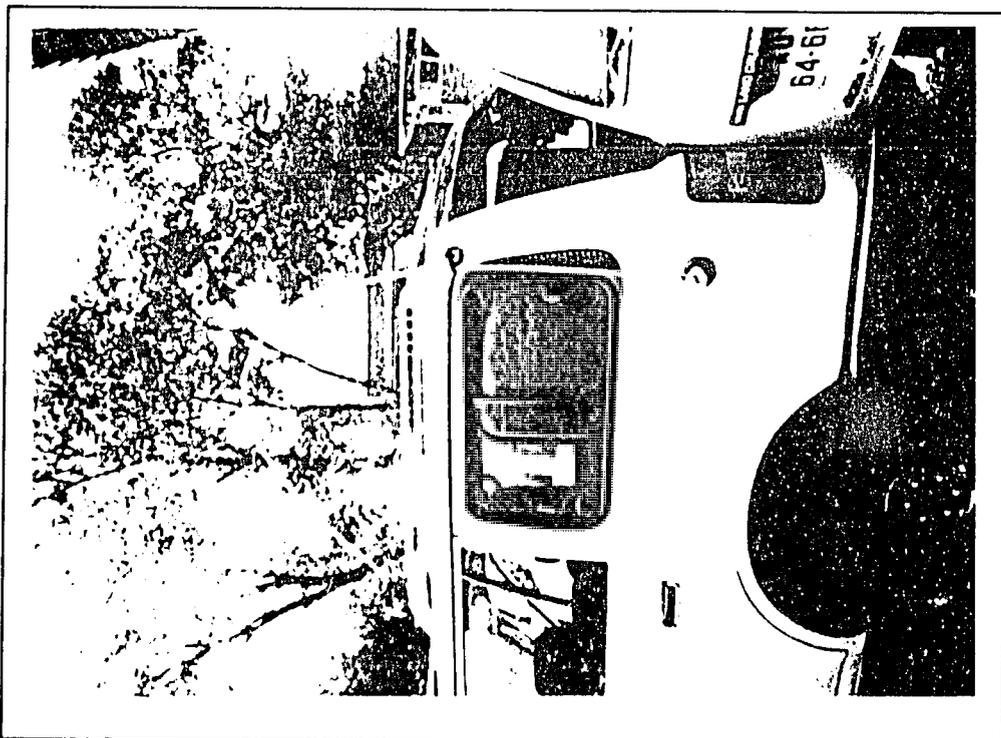


Figure 6 AID Pakistan HF Installation. Side view of whip antenna installation.

Site Photographs

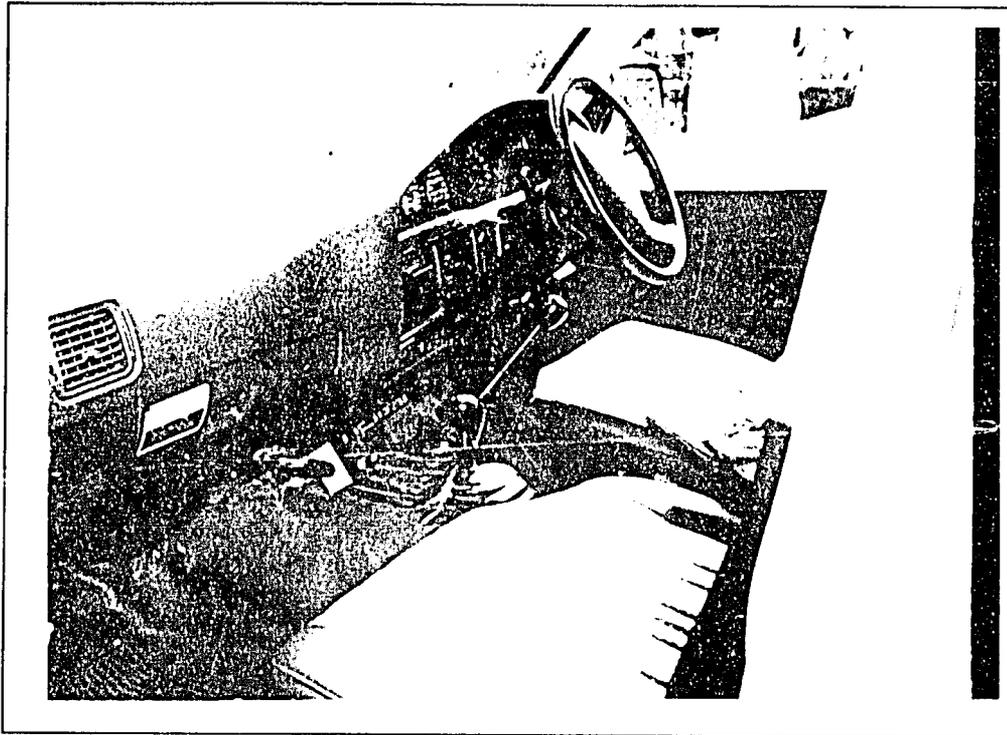


Figure 1 UN Mobile Radio Remote Control Installation

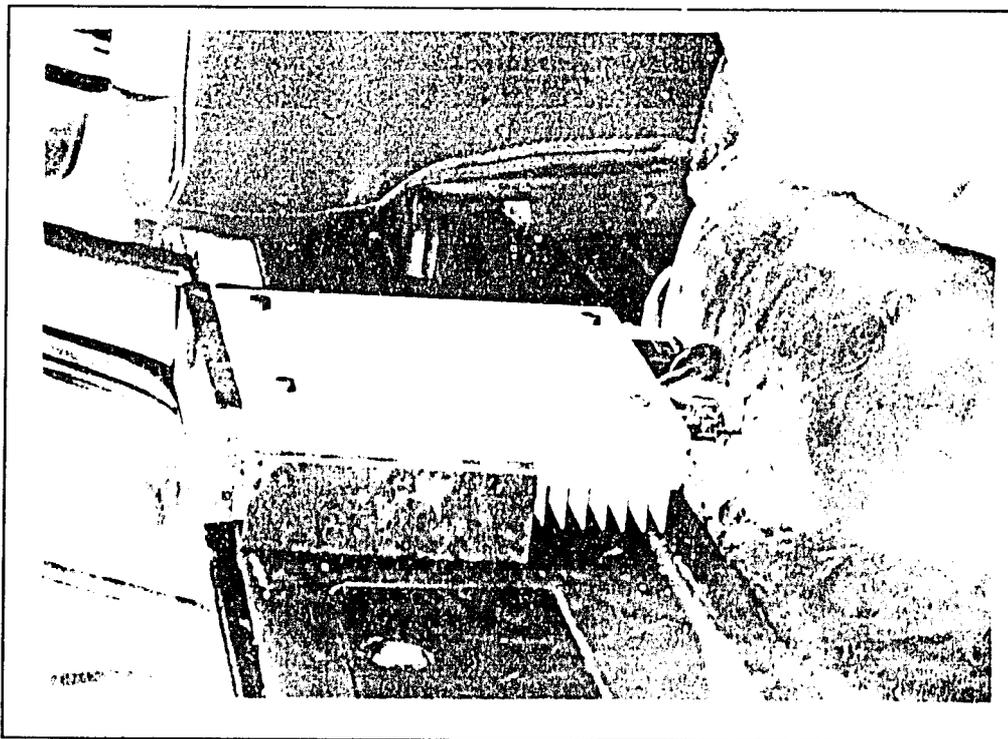


Figure 2 UN Mobile Radio HF Tuner Installation.

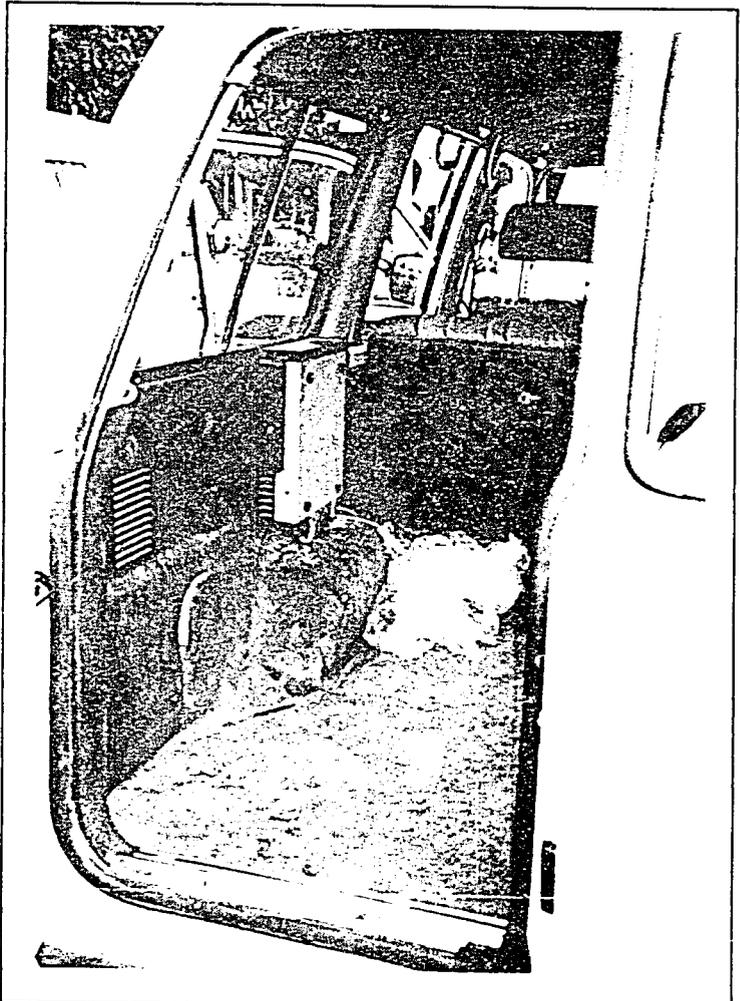


Figure 3 UN Mobile Radio Tuner Installation.

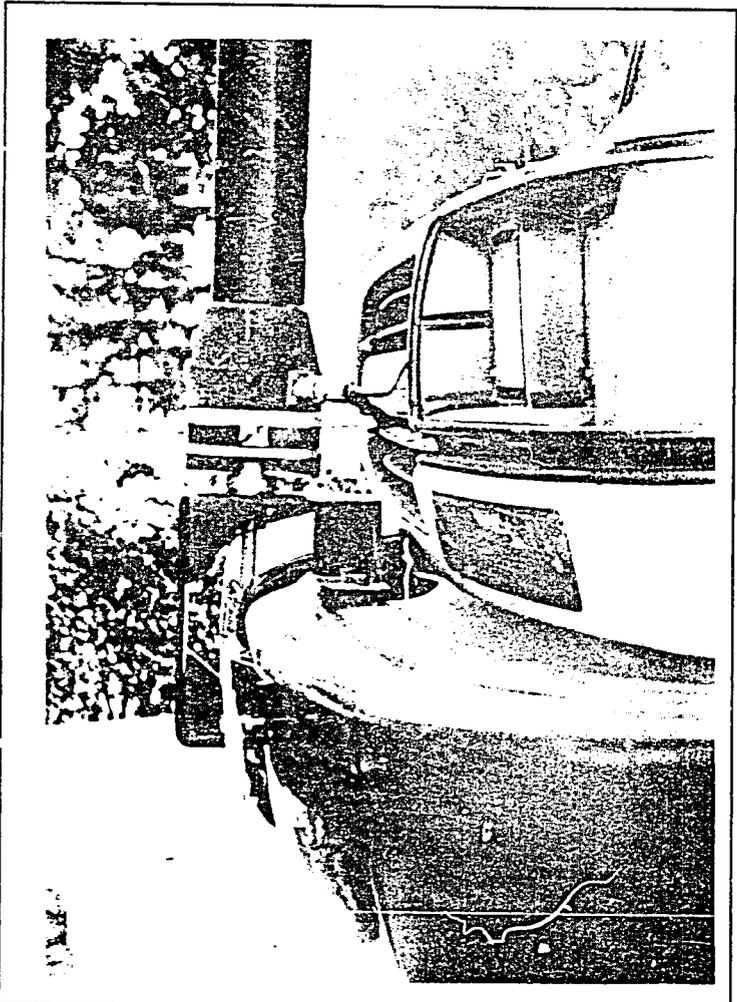


Figure 4 UN Mobile Radio Antenna Installation.

Site Photographs

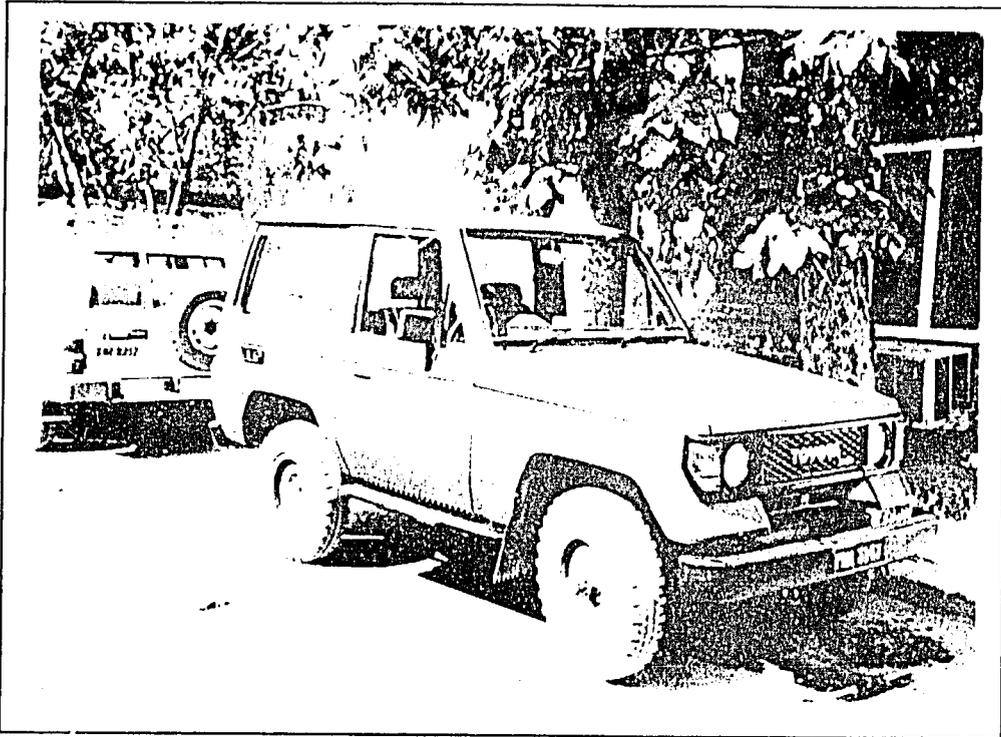


Figure 1 RONCO Short Wheel-Based Toyota Land Cruiser.



Figure 2 RONCO Short Wheel-Based Toyota Land Cruiser. Driver's side.



Figure 3 RONCO Short Wheel-Based Toyota Land Cruiser. Curb-side, and rear door.



Figure 4 RONCO Short Wheel-Based Toyota Land Cruiser. Rear right door, bumper and gas tank location.

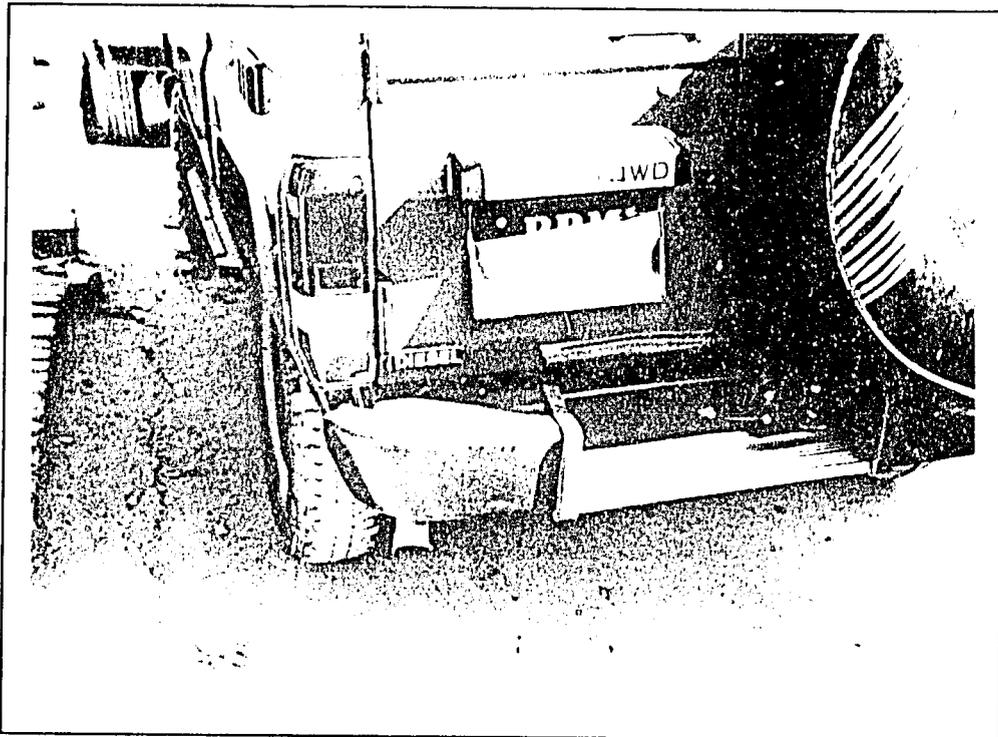


Figure 5 RONCO Short Wheel-Based Toyota Land Cruiser. Rear bumper assembly and left rear door.

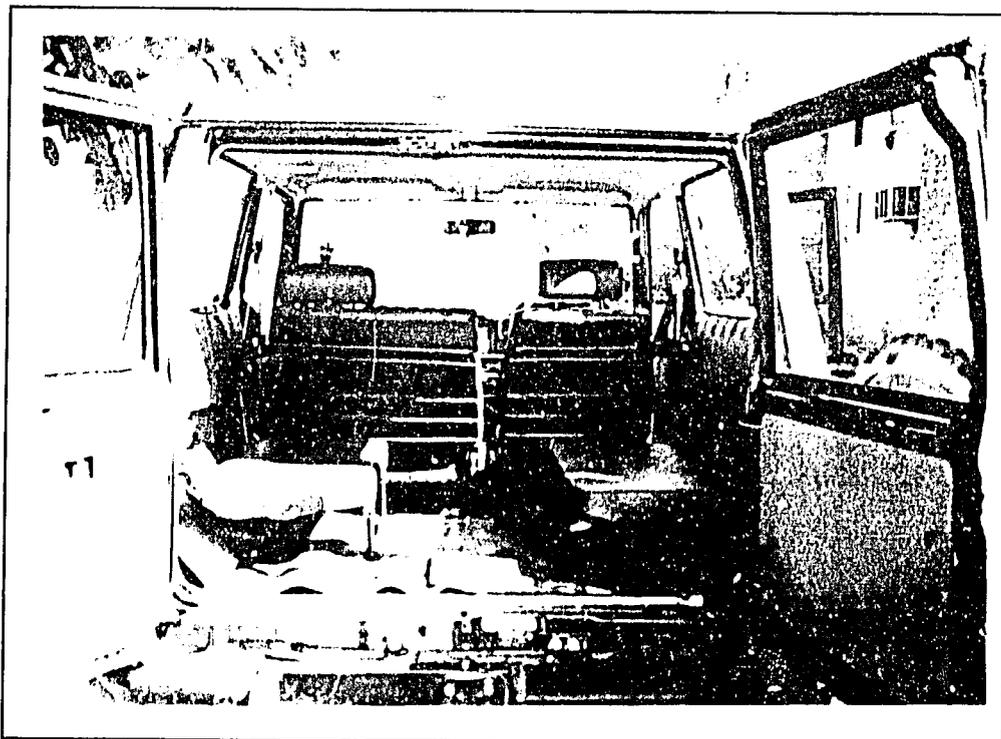


Figure 6 RONCO Short Wheel-Based Toyota Land Cruiser. Rear doors opened. Note jump seats over rear wheel wells.

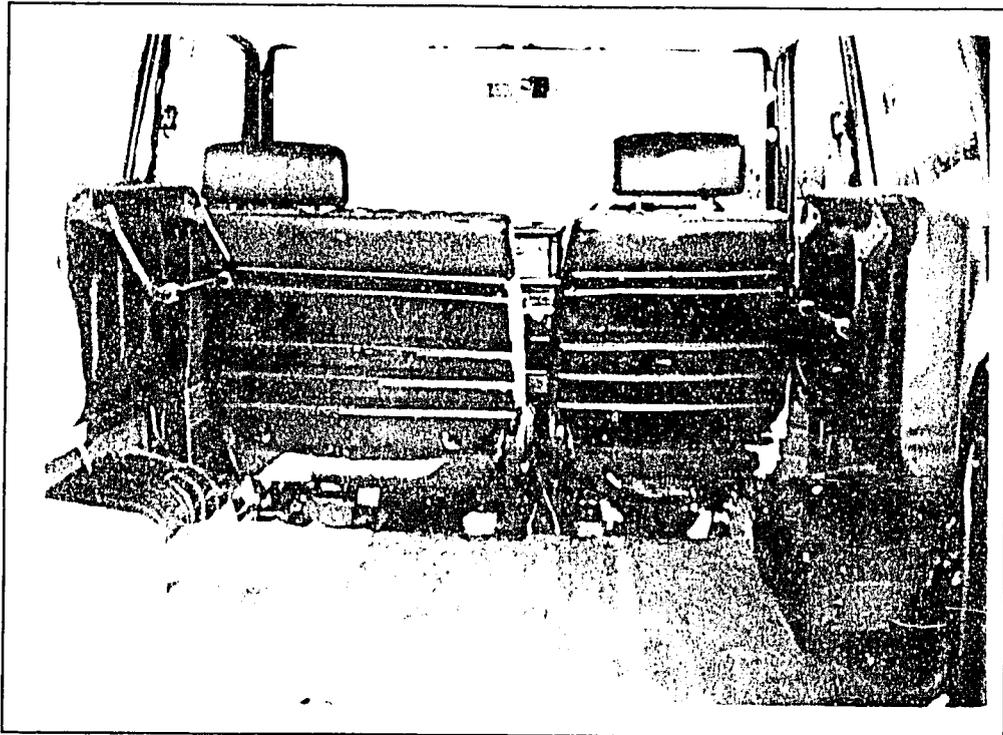


Figure 7 RONCO Short Wheel-Based Toyota Land Cruiser. Rear section with seats in upright position.



Figure 8 RONCO Long Wheel-Based Toyota Land Cruiser.



Figure 9 RONCO Long Wheel-Based Toyota Land Cruiser. Close-up of curb-side, and rear door area. Most suitable antenna mount location.

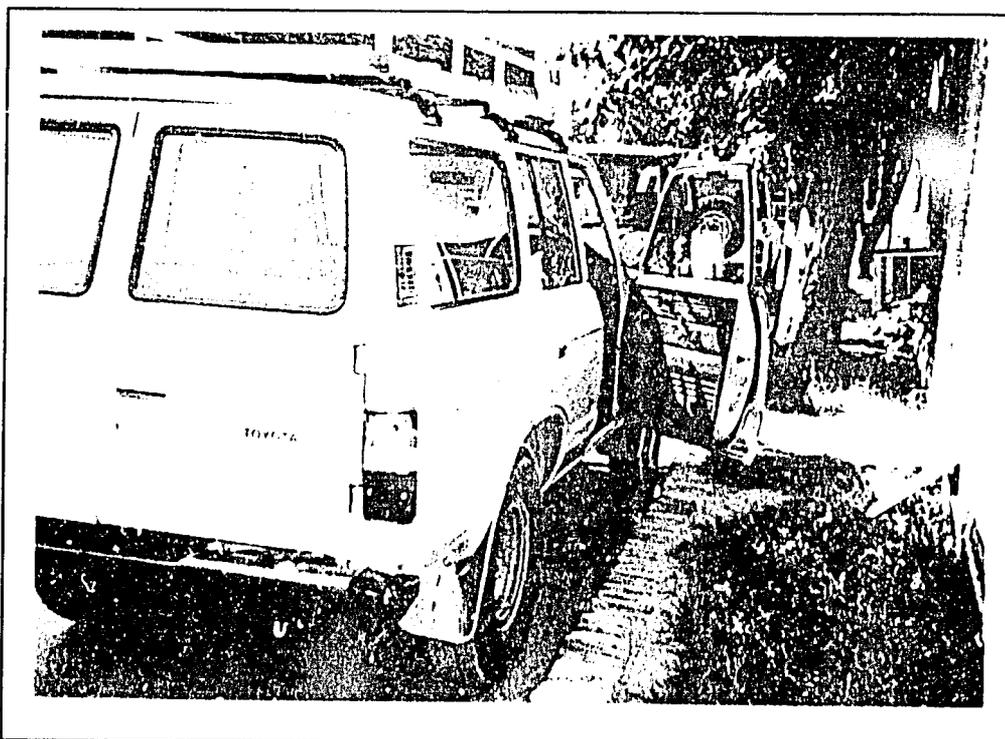


Figure 10 RONCO Long Wheel-Based Toyota Landcruiser. Driver's side view.

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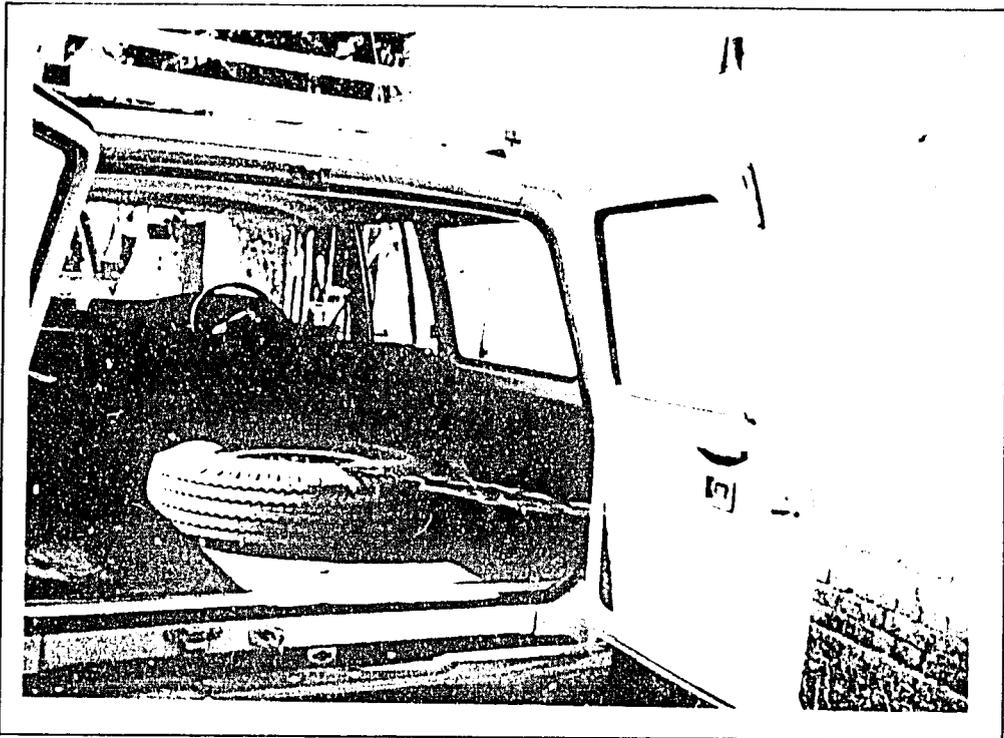


Figure 11 RONCO Long Wheel-Based Toyota Landcruiser. Rear section of vehicle.

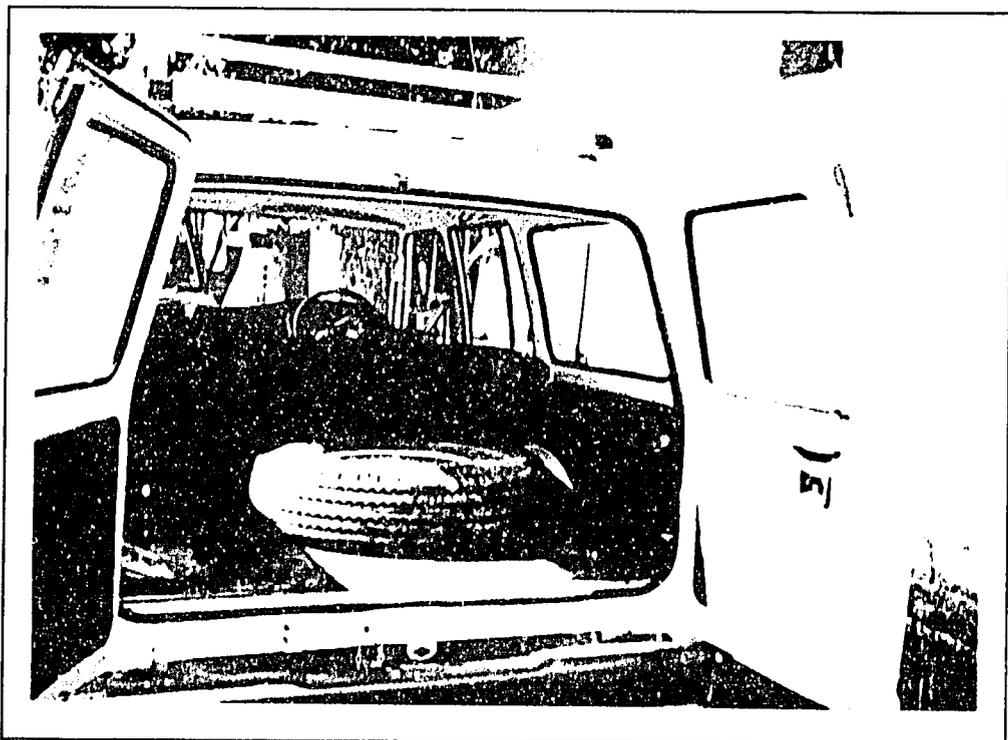


Figure 12 RONCO Long Wheel-Based Toyota Landcruiser. Rear doors opened.

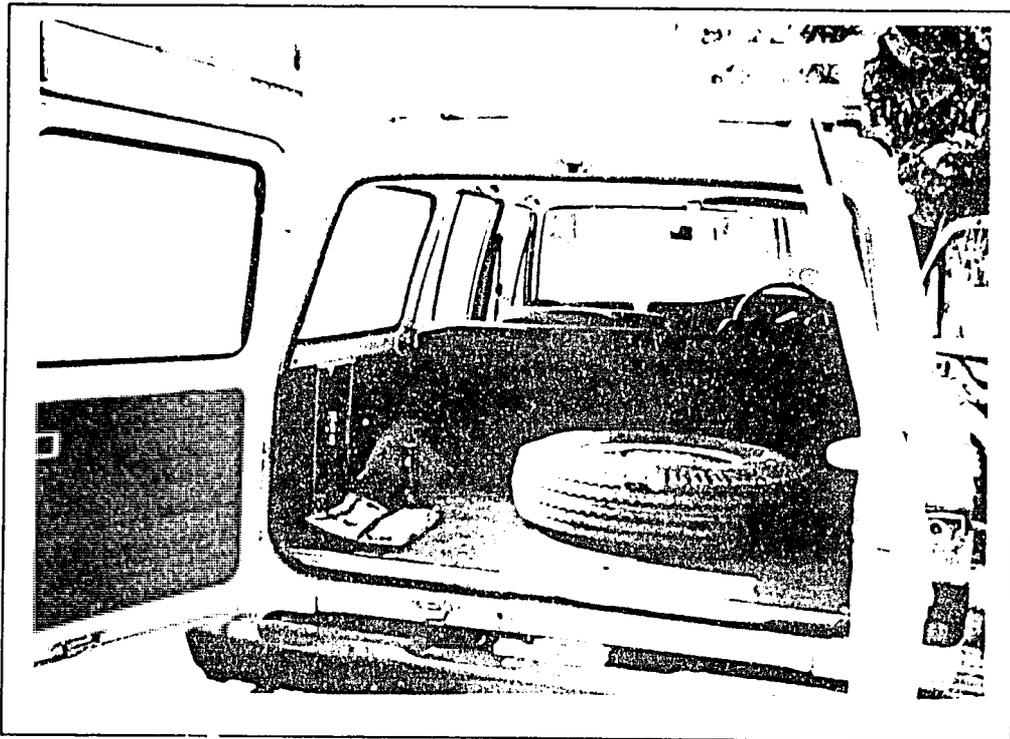


Figure 13 RONCO Long Wheel-Based Toyota Landcruiser. Close-up of curb-side, tire tool section on left.



Figure 14 RONCO Mitsubishi Pajero.



Figure 15 RONCO Mitsubishi Pajero. Rear section of vehicle. Seats in upright storage position.

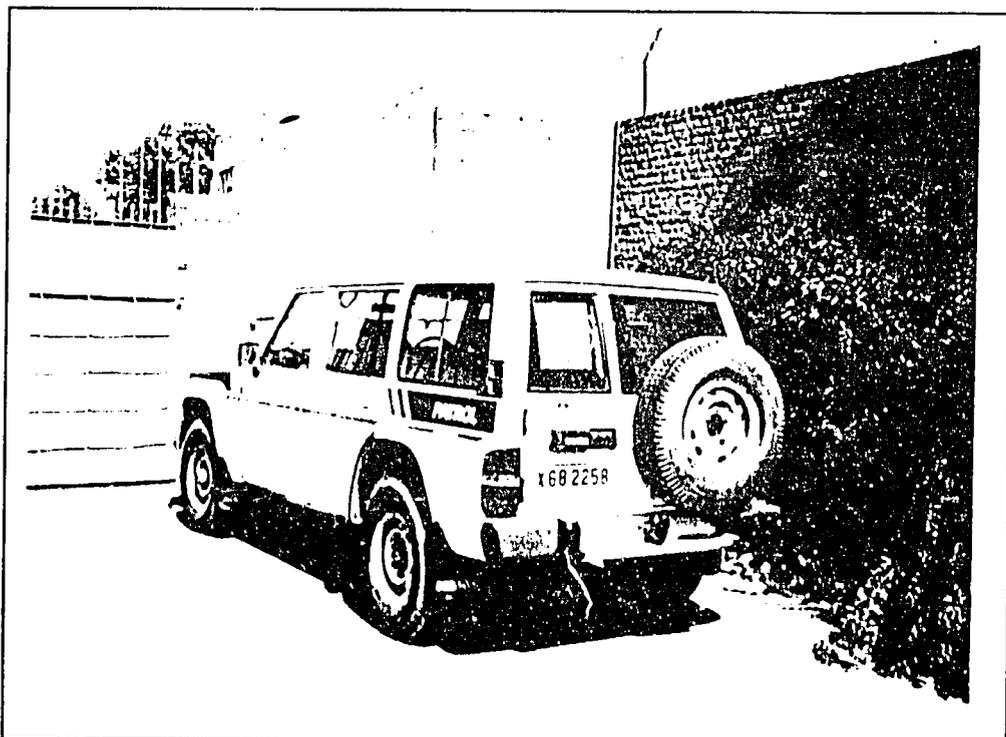


Figure 16 RONCO Nissan 4WD Patrol. Similar design as the Long Wheel-Based Toyota Landcruiser.

Miscellaneous Photographs



Figure 1 Peshawar MDC Hino Truck.

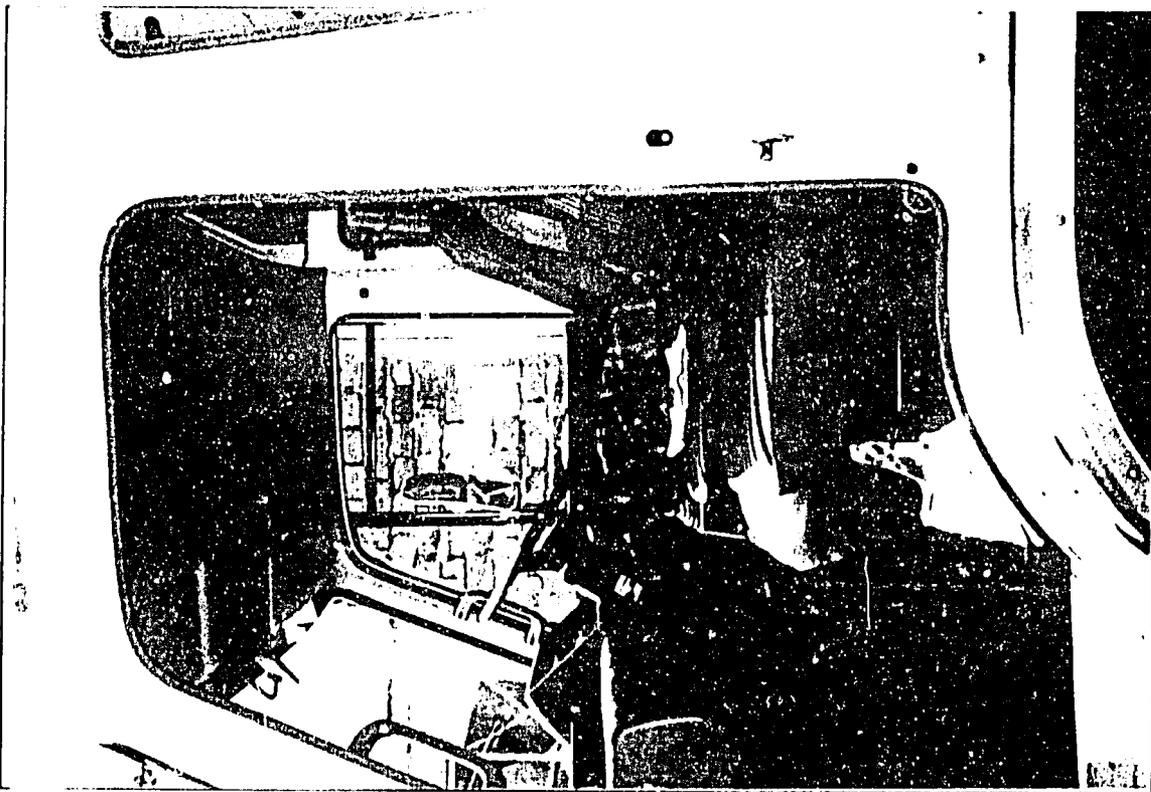


Figure 2 Peshawar MDC Hino Truck Interior.



Figure 3 Peshawar MDC Hino Truck. Available space behind seats.



Figure 4 Peshawar Bulk Fuel Oil Facility 10 km West of Pabbi.

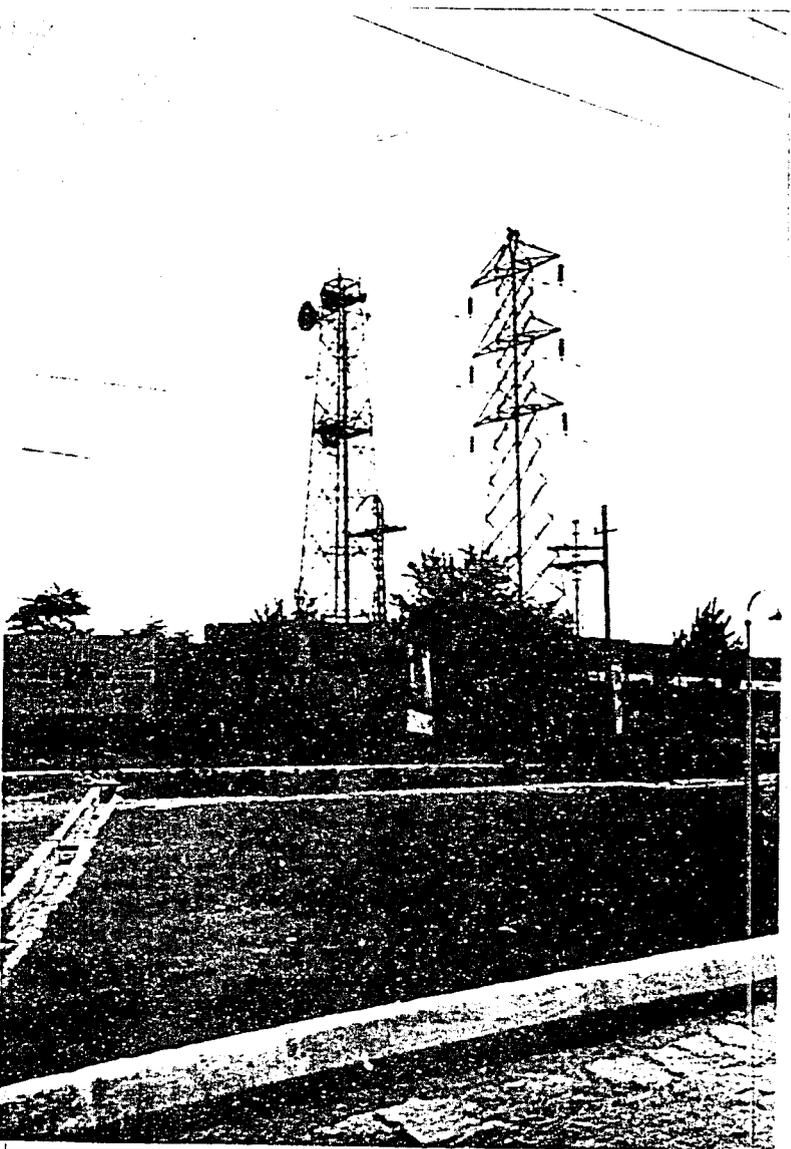


Figure 5 Peshawar Pakel Microwave Tower (eastern outskirts of Peshawar City).



Figure 6 Peshawar. Broadcast Facility approx. 10 km east of Peshawar City.

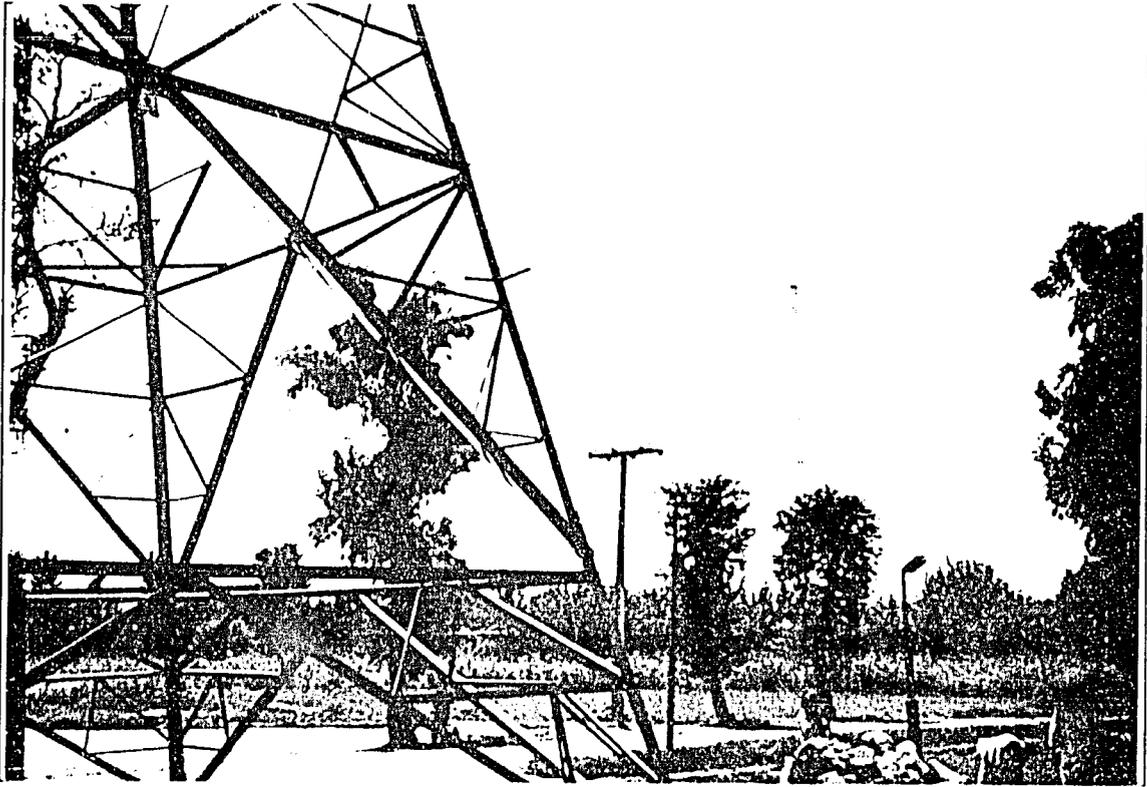


Figure 7 Peshawar. Broadcast facility 10 km east of Peshawar City.

**SURVEY REPORT  
HF TELECOMMUNICATIONS SYSTEM**

**APPENDIX B**

**Quetta, Pakistan Photographs**

**ASTRO Systems Inc.**  
7979 Old Georgetown Rd.  
Bethesda, Maryland 20814  
(301) 913-2800/Fax (301) 913-2803

**APPENDIX B  
PHOTOGRAPH INDEX**

- Q1 Quetta HF Base Station Location
- Q2 RONCO ALO
- Q3 DAI
- Q4 Not Used
- Q5 UNO
- Q6 MSH
- Q7 AID/Rep & VITA

Site Photographs

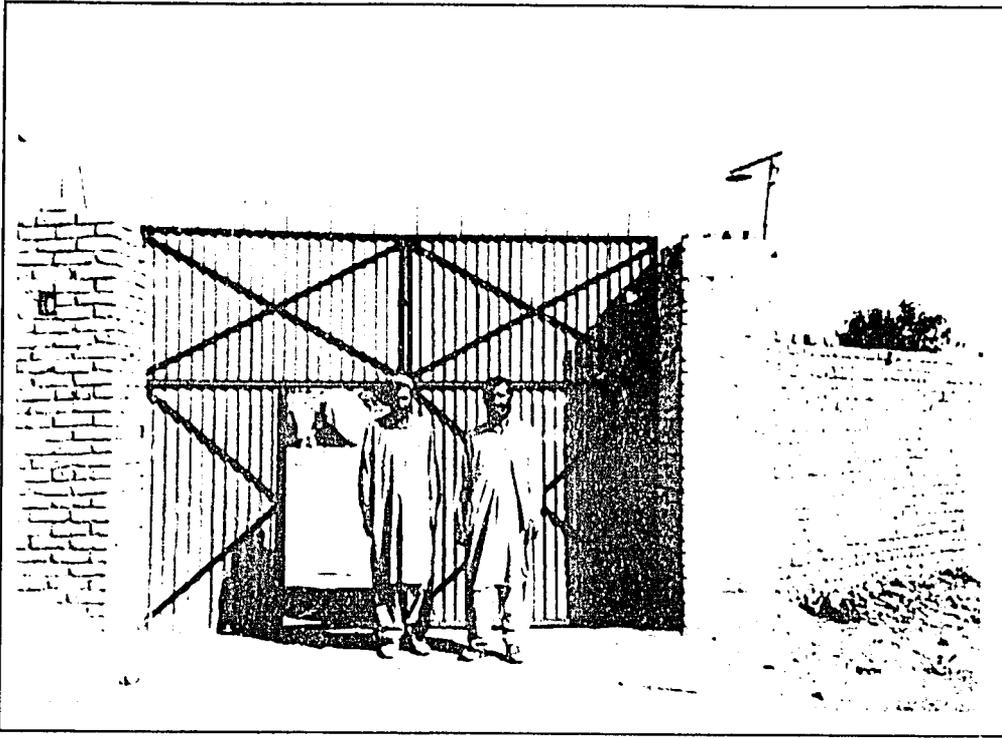


Figure 1 Quetta HF Base Station Antenna Site. Front Gate, Facing North.

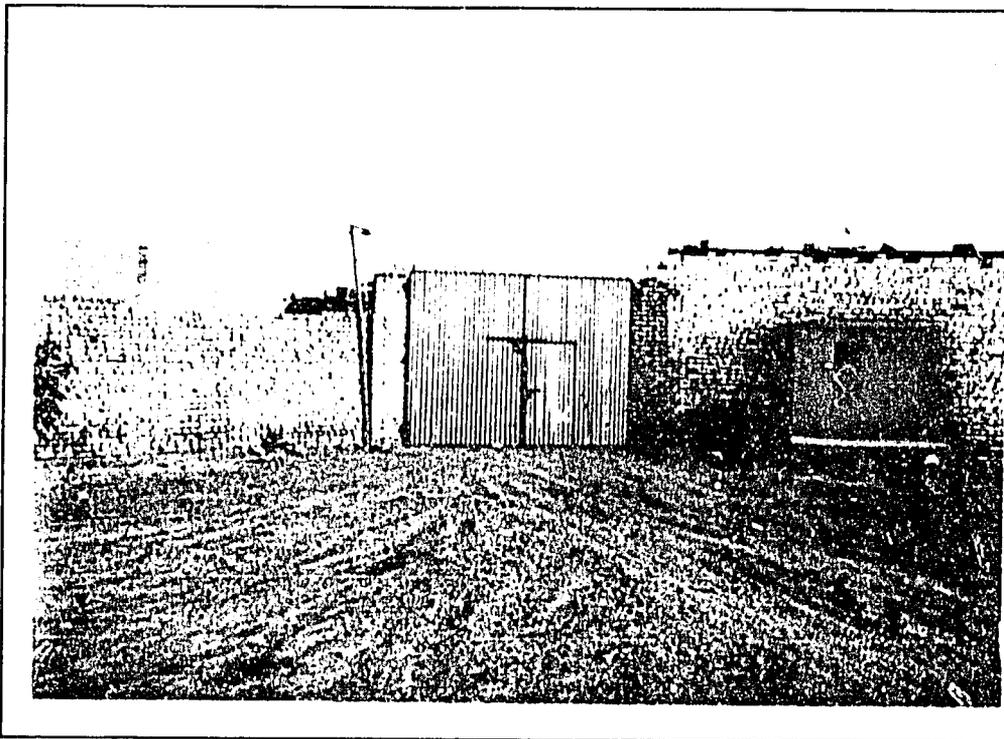


Figure 2 Quetta HF Base Station Antenna Site. Front Gate Facing South.

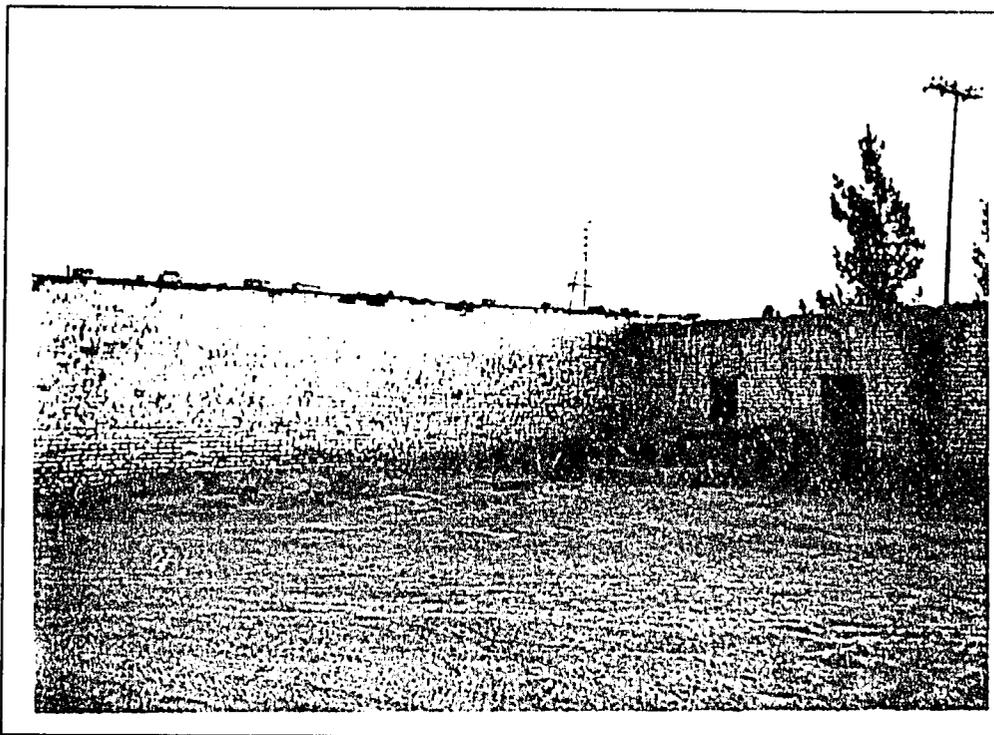


Figure 3 Quetta HF Base Station Antenna Site. Southwest Corner.

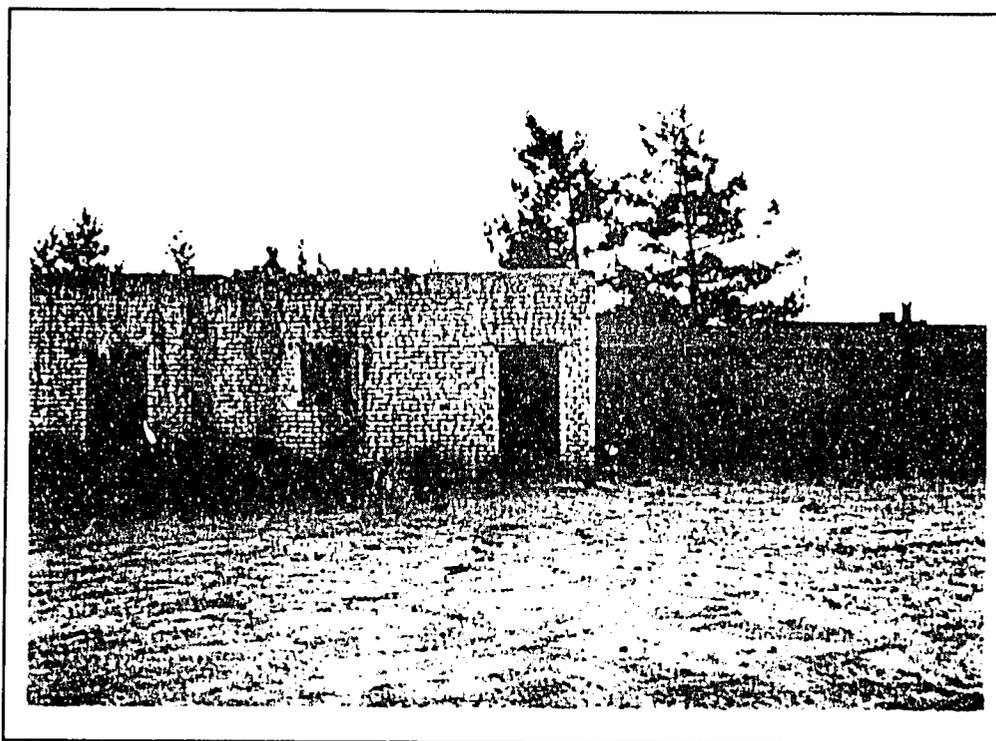


Figure 4 Quetta HF Base Station Antenna Site. Part of West Wall.

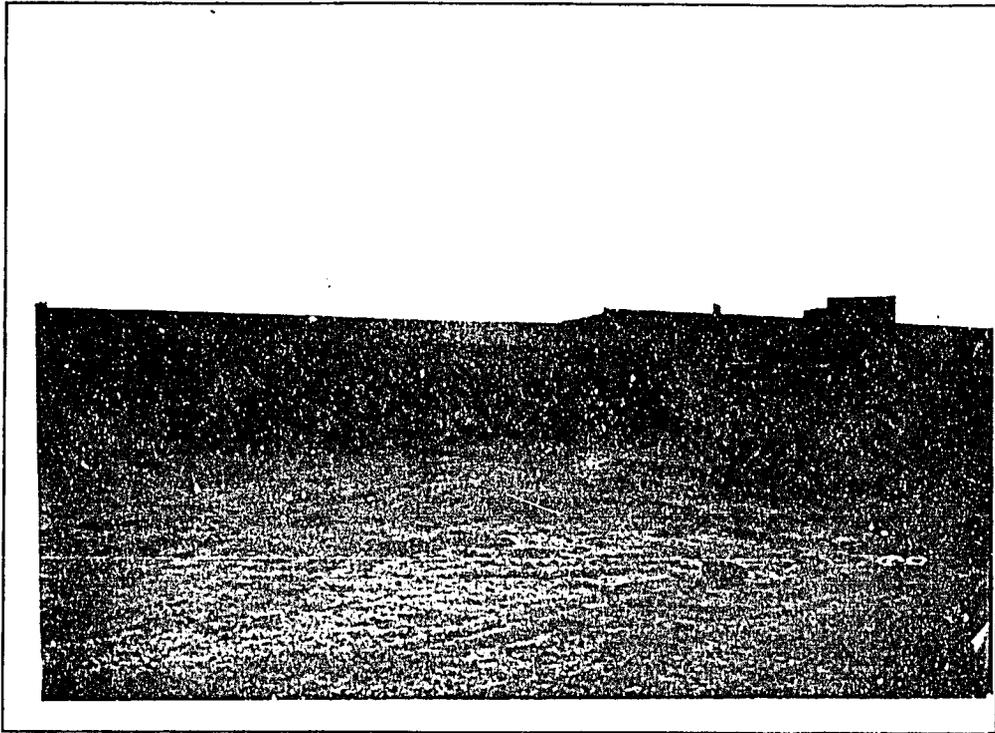


Figure 5 Qetta HF Base Station Antenna Site. West Wall Continued.

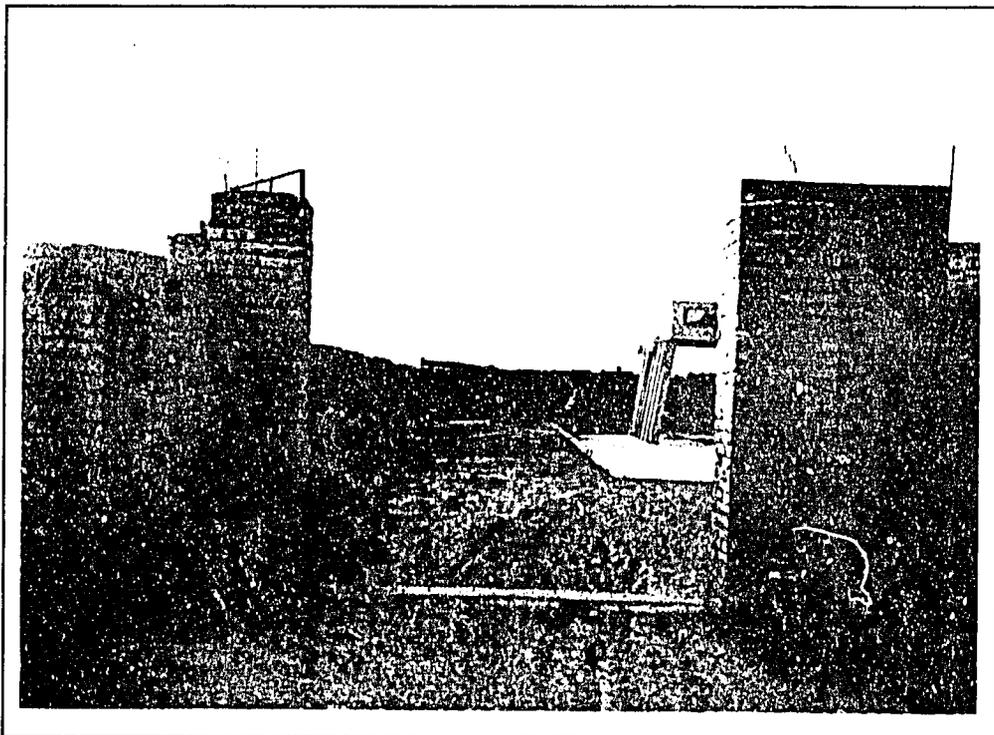


Figure 6 Qetta HF Base Station Antenna Site. Facing North. West wall on left.

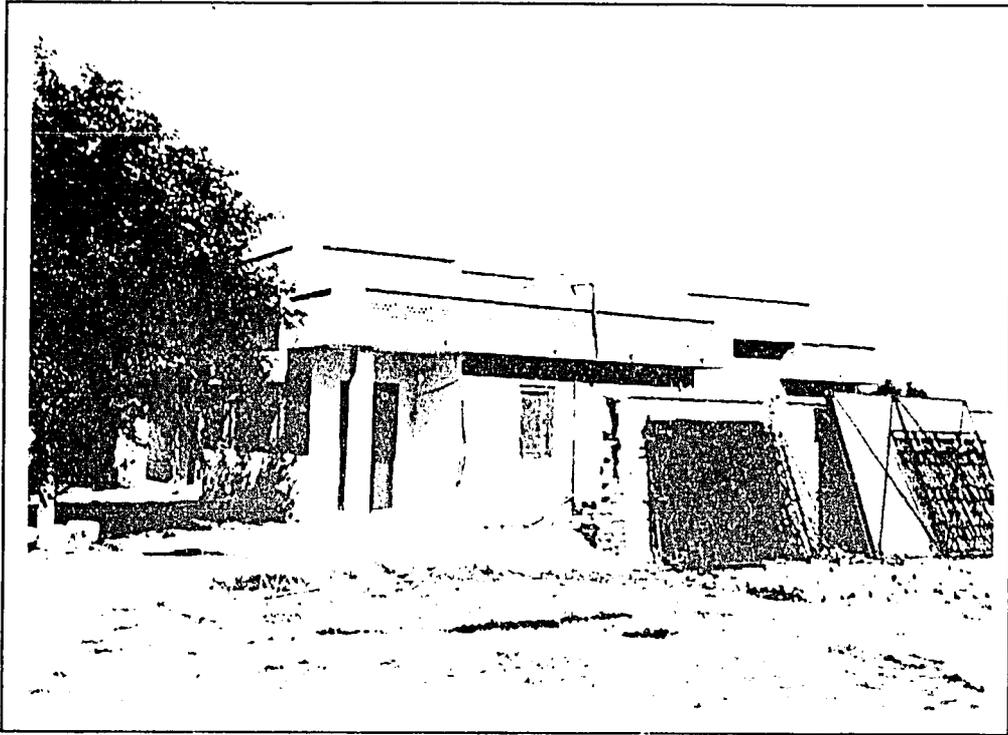


Figure 7 Quetta HF Base Station Antenna Site. Existing building, facing Northwest.

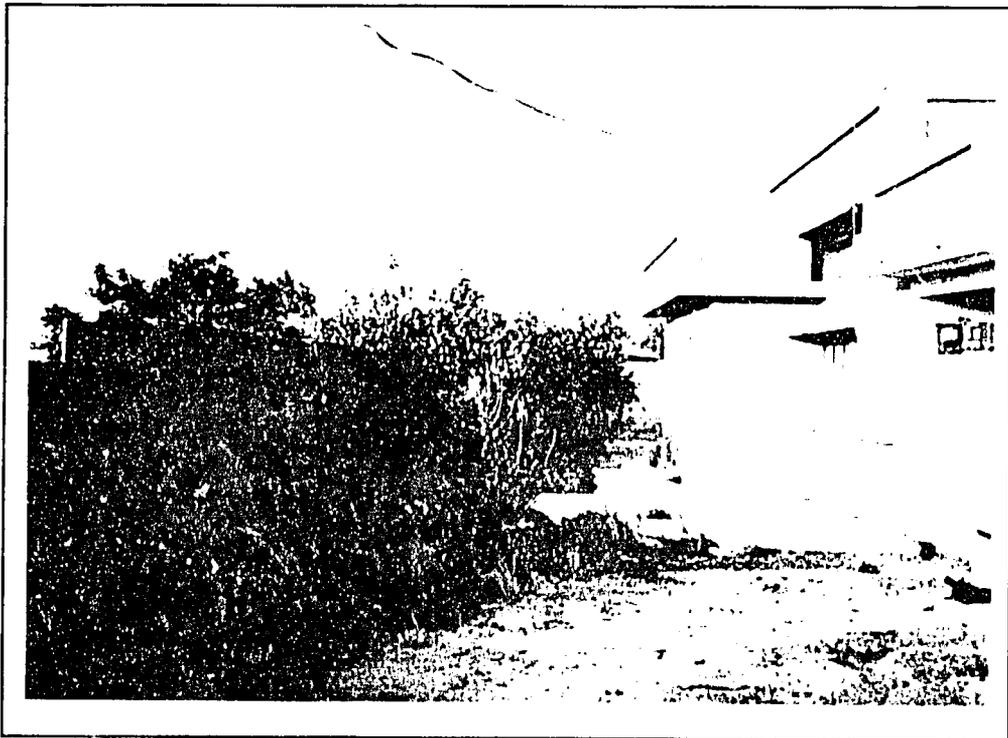


Figure 8 Quetta HF Base Station Antenna Site. North section, rear of building.

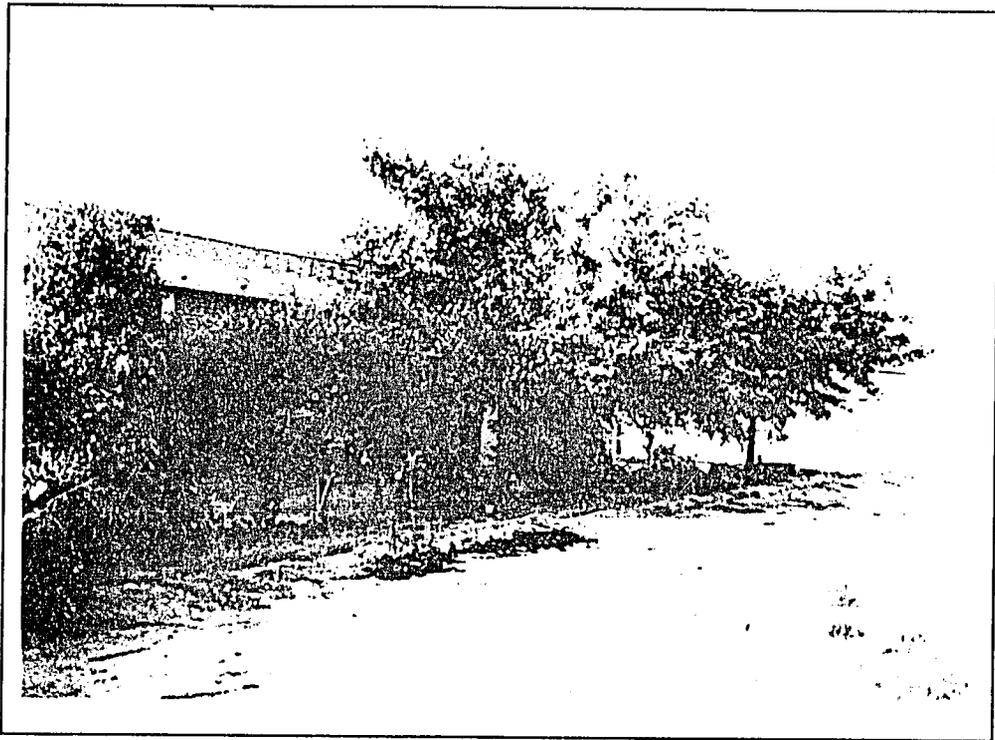


Figure 9 Quetta HF Base Station Antenna Site. Front section of building.

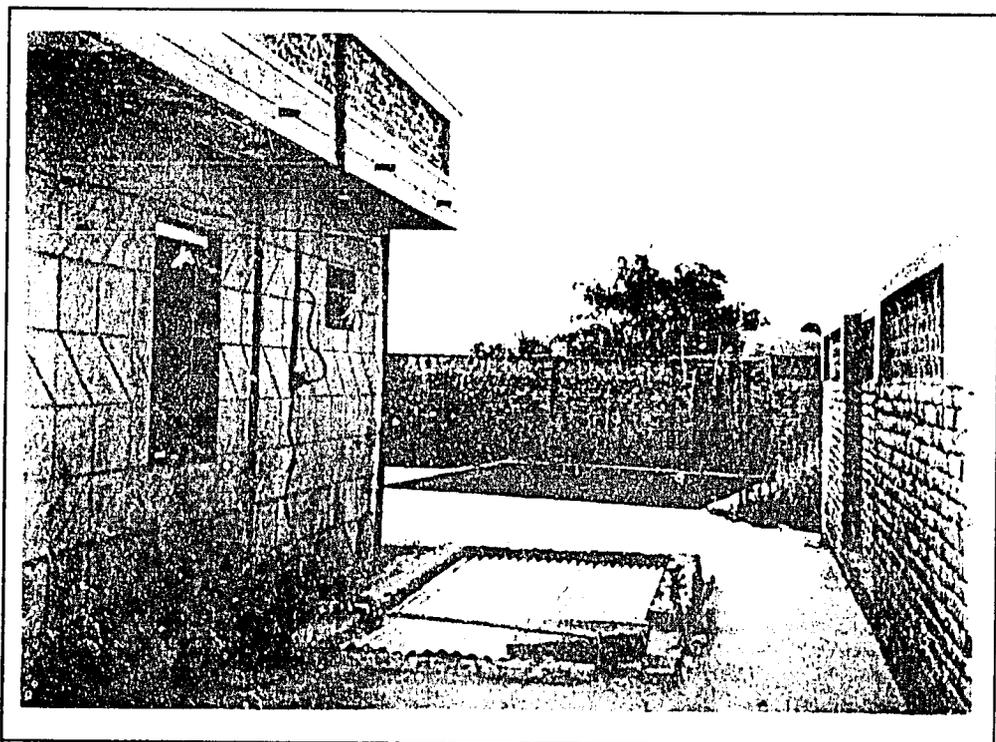


Figure 10 Quetta HF Base Station Antenna Site. Right section of building facing North.

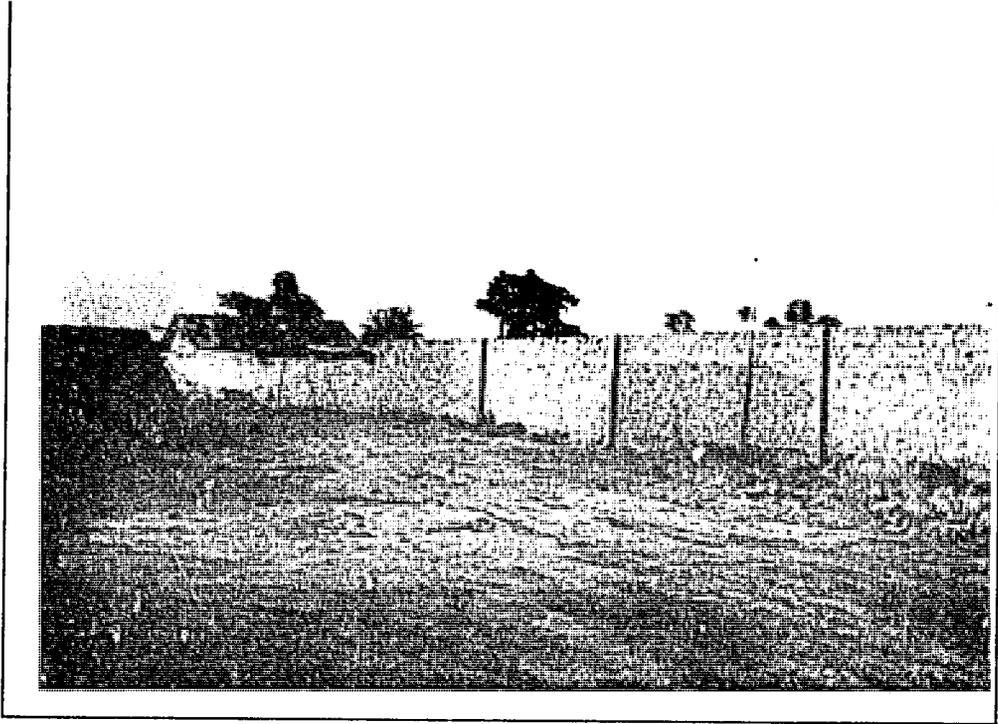


Figure 11 Quetta HF Base Station Antenna Site. East Wall.

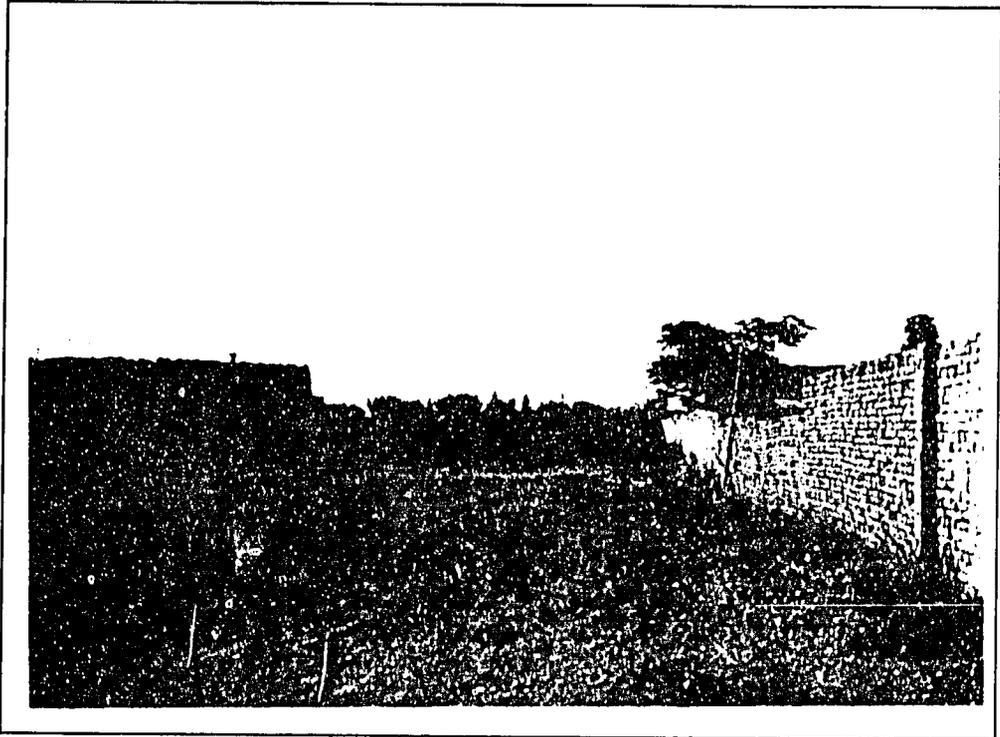


Figure 12 Quetta HF Base Station Antenna Site. Inner wall section, facing north.

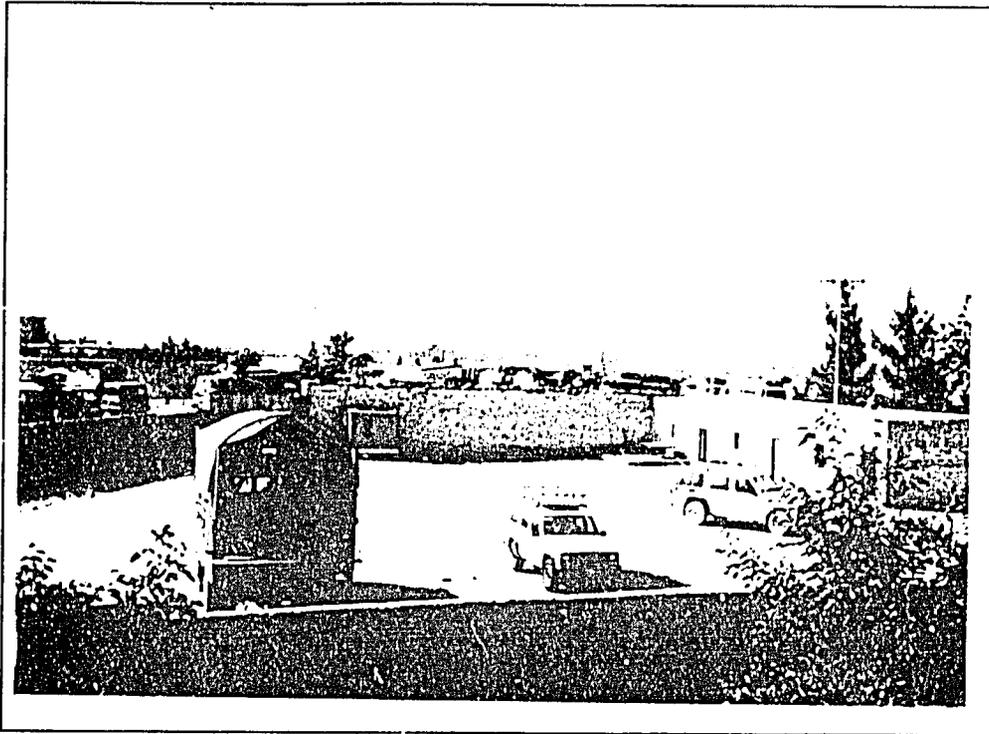


Figure 13 Quetta HF Base Station Site. West wall, facing North.

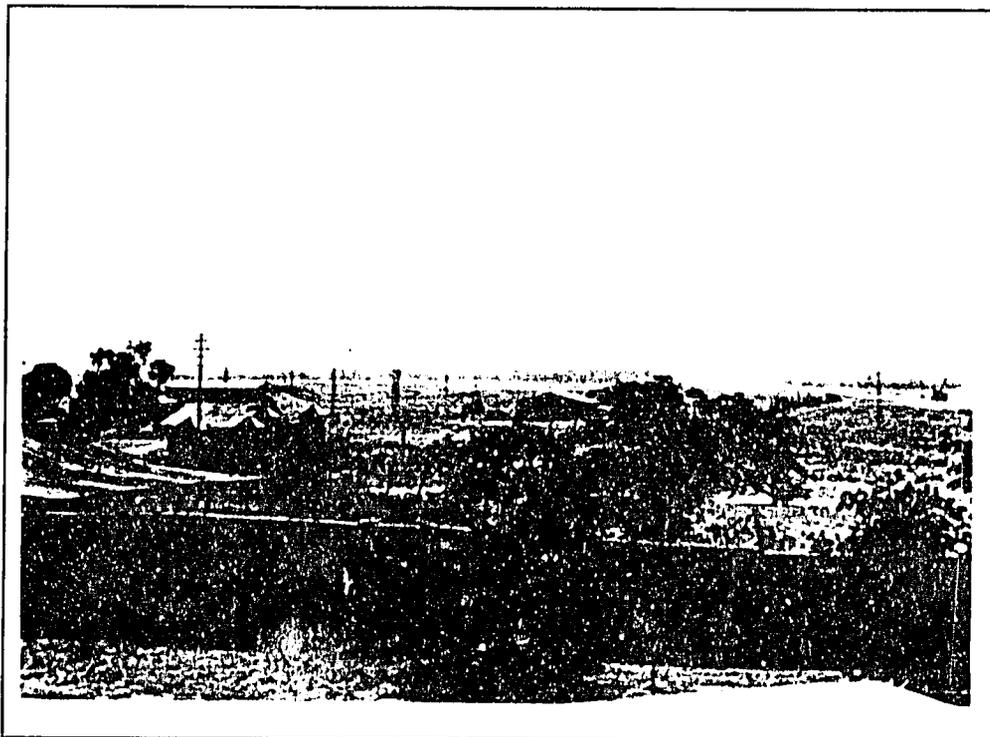


Figure 14 Quetta HF Base Station Site. Facing South, viewed from top of existing building.

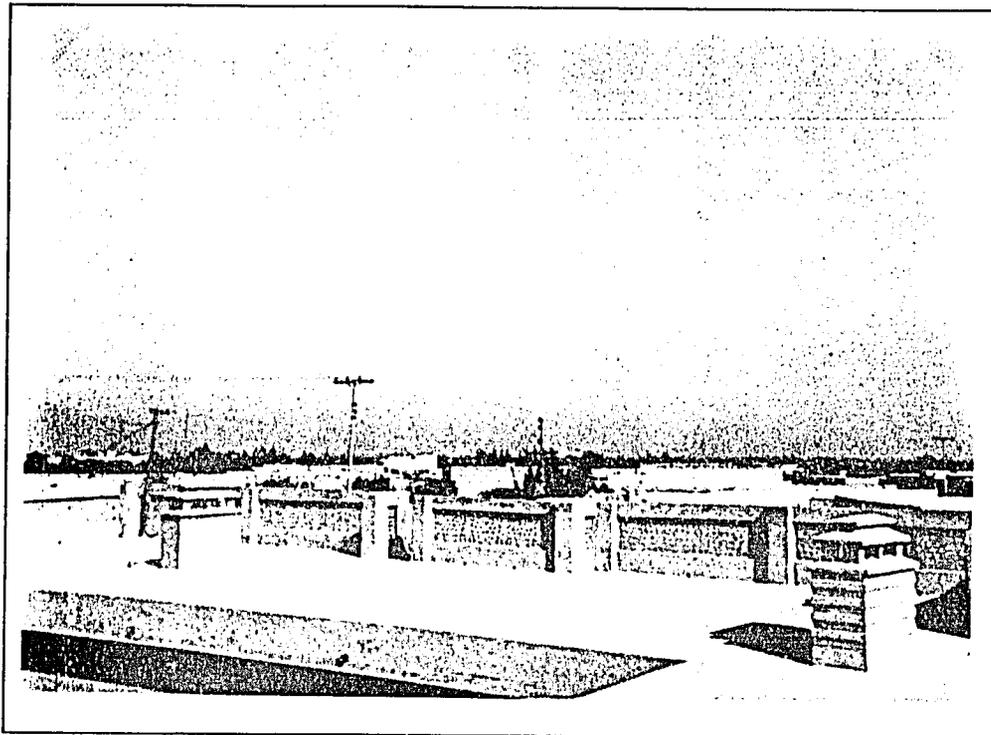


Figure 15 Quetta HF Base Station Site. View facing east from existing building.

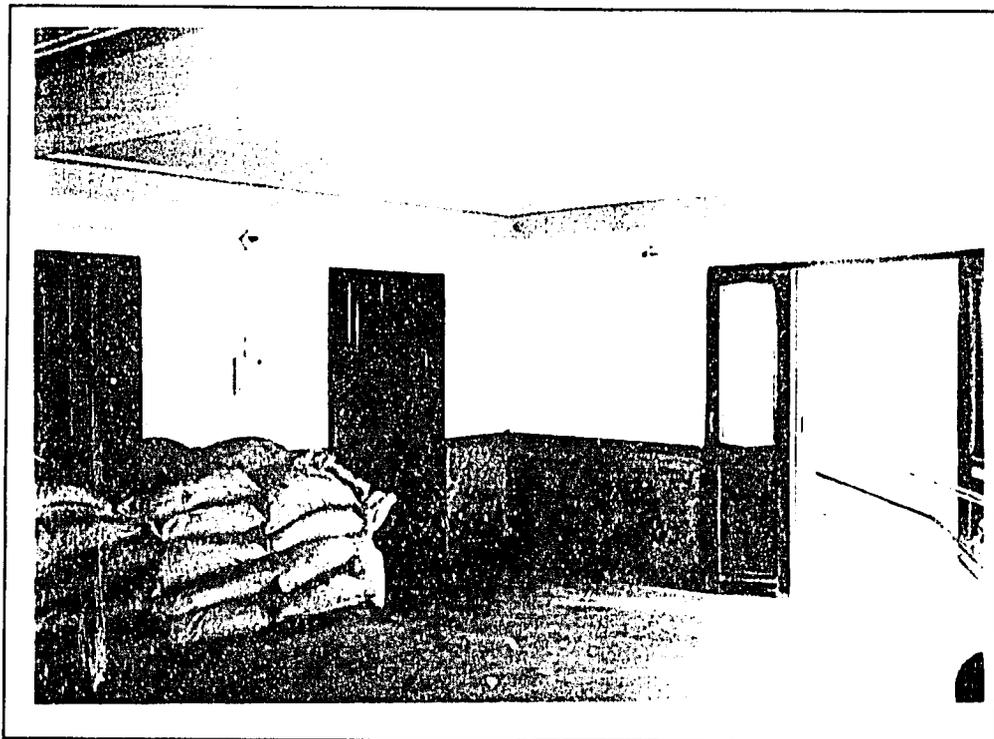


Figure 16 Quetta HF Base Station Site. Proposed Equipment Room Location.

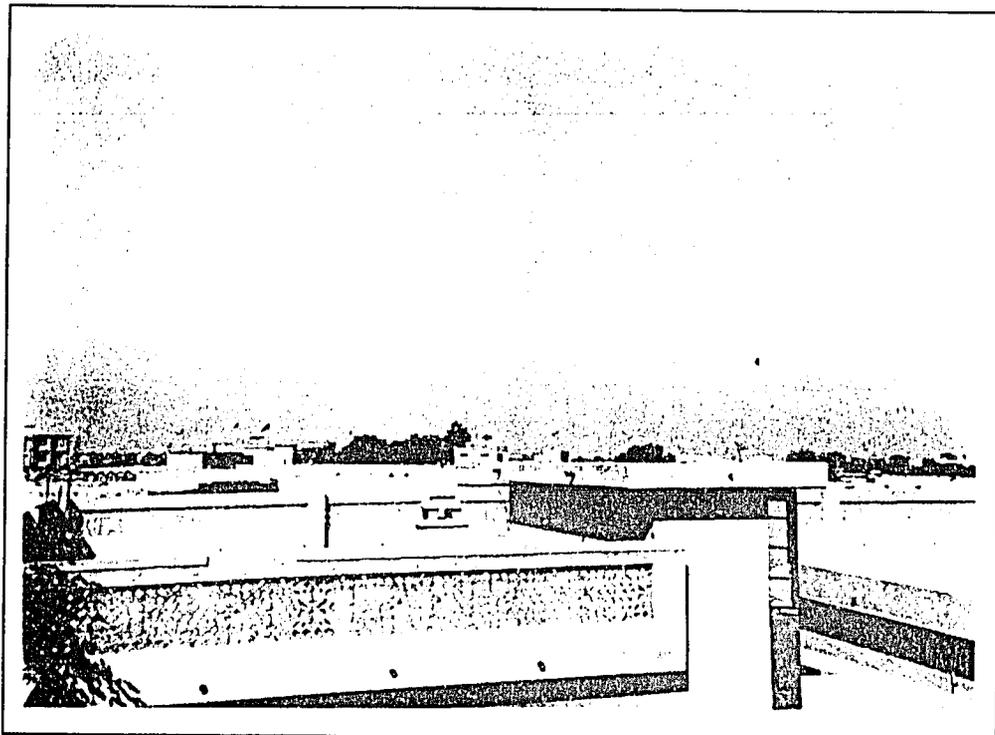


Figure 17 Quetta HF Base Station Site. View from top of existing building.

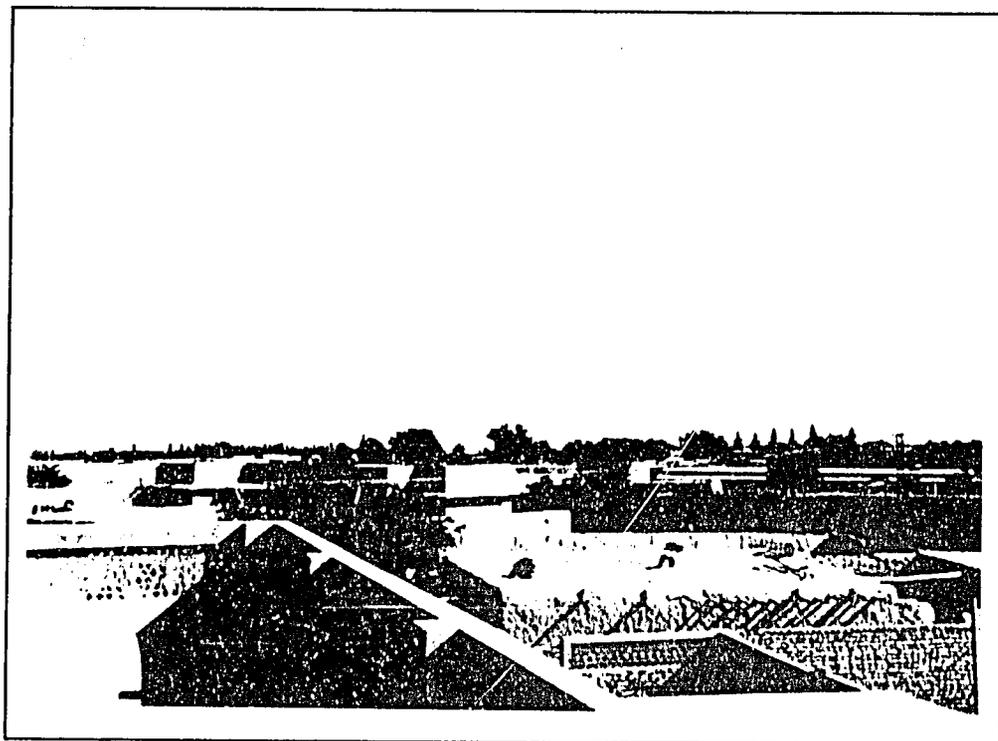


Figure 18 Quetta HF Base Station Site. View from existing building.

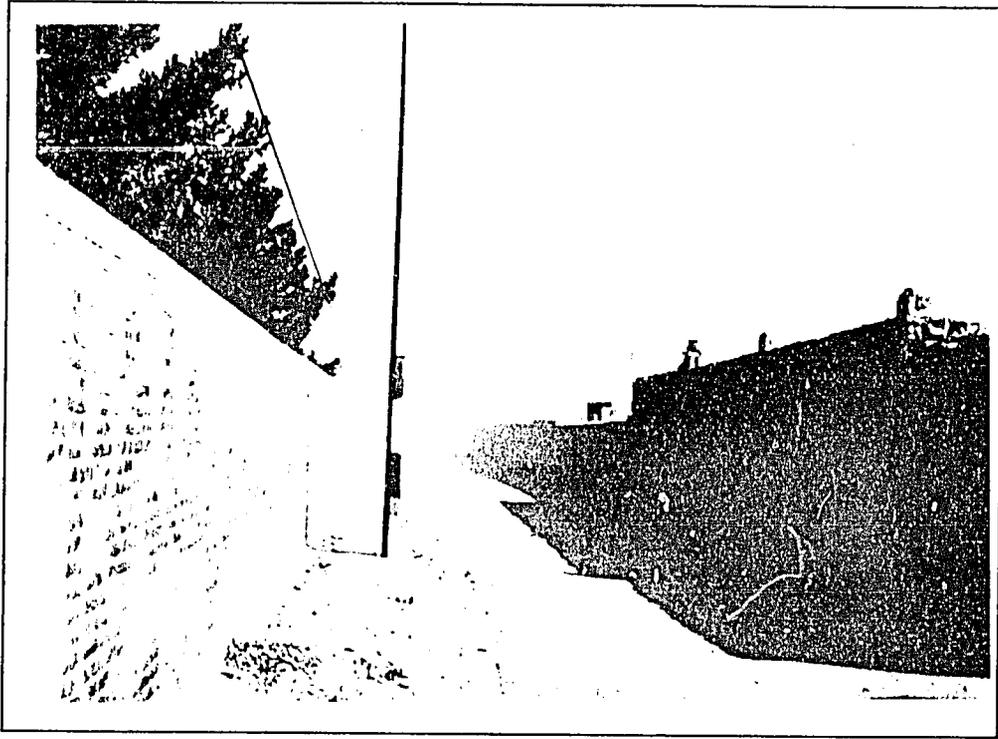


Figure 21 Quetta HF Base Station Site. View outside west wall of proposed area.

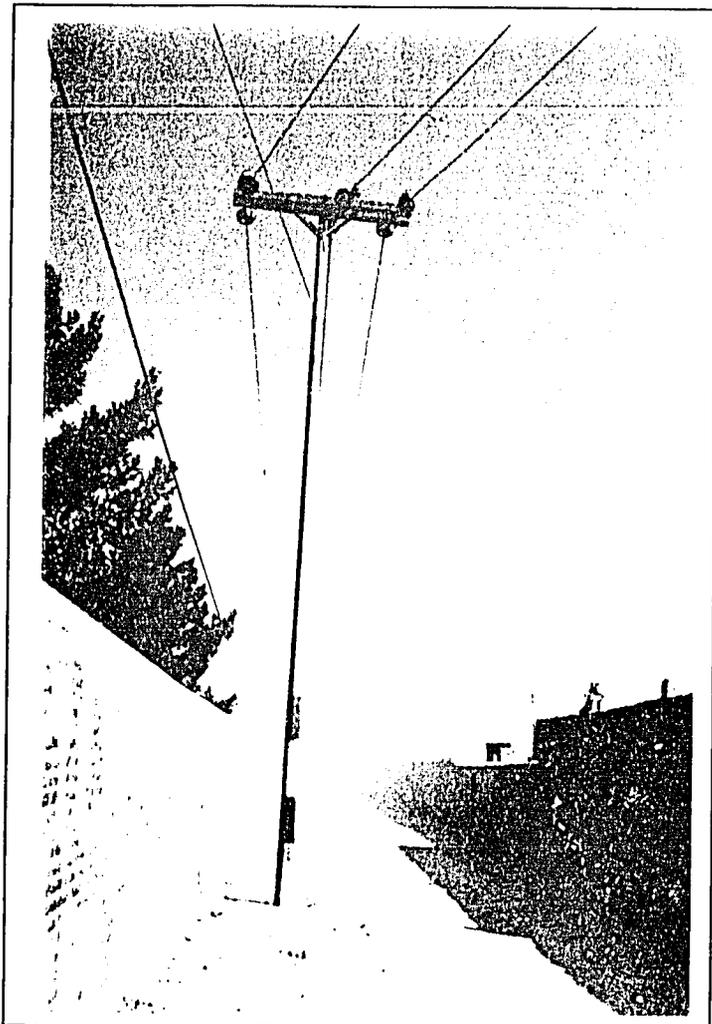


Figure 22 Quetta HF Base Station Site. Power lines outside West wall.

Site Photographs

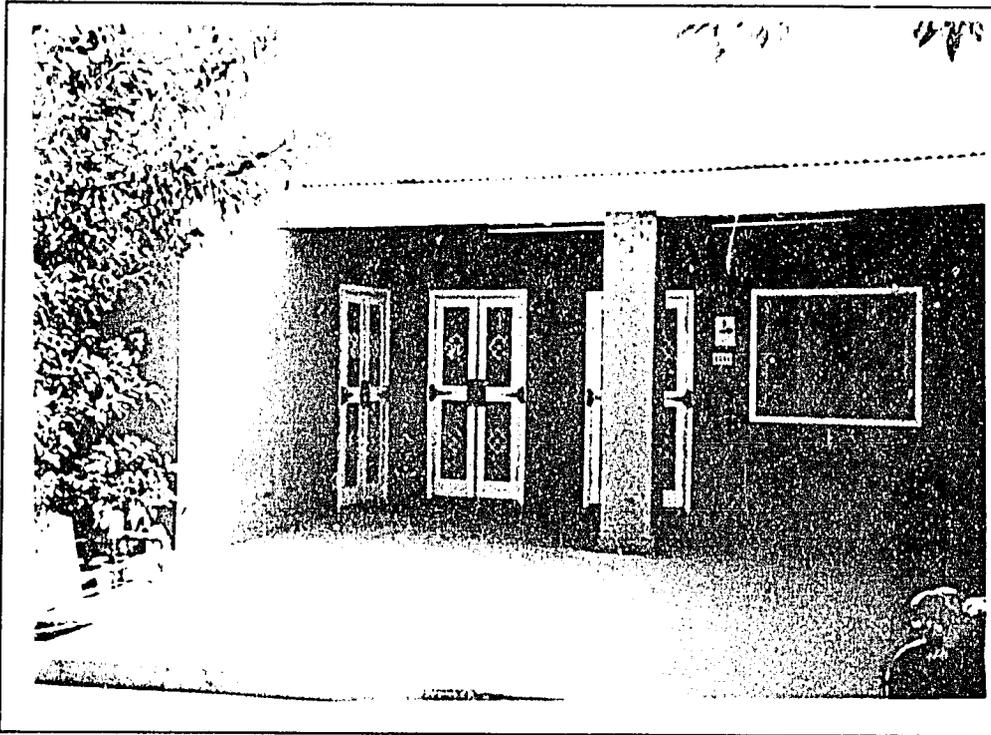


Figure 1 Quetta RONCO Office Facility. ALO office, left door. Second phone to be installed in MDC office on right.

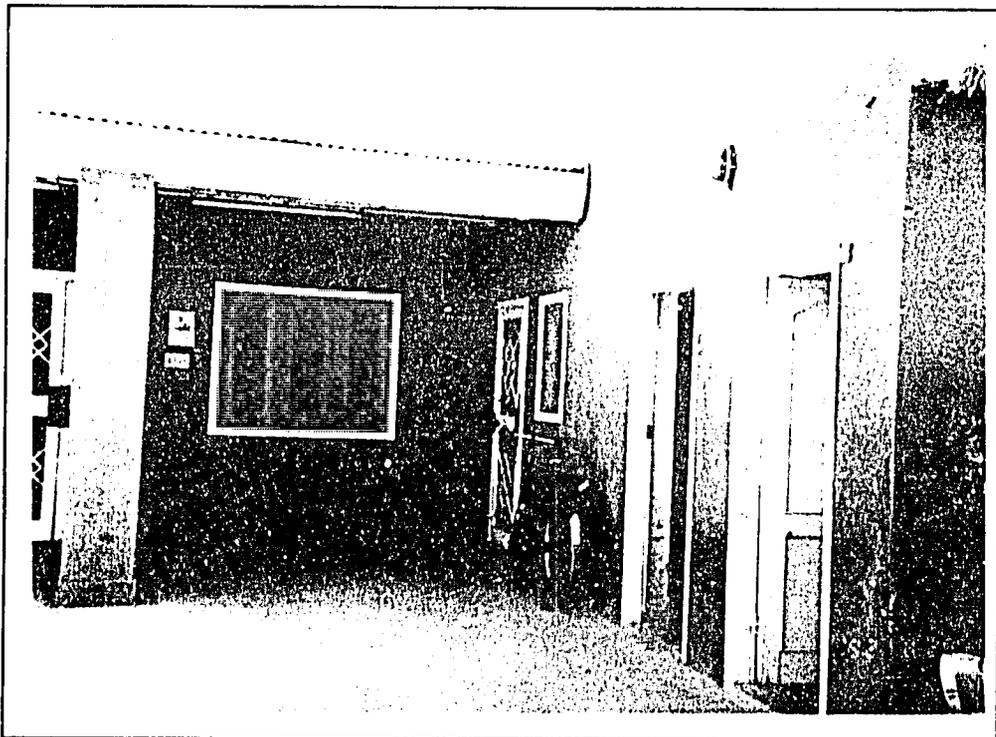


Figure 2 Quetta RONCO Office Facility. Additional parts of office structure.

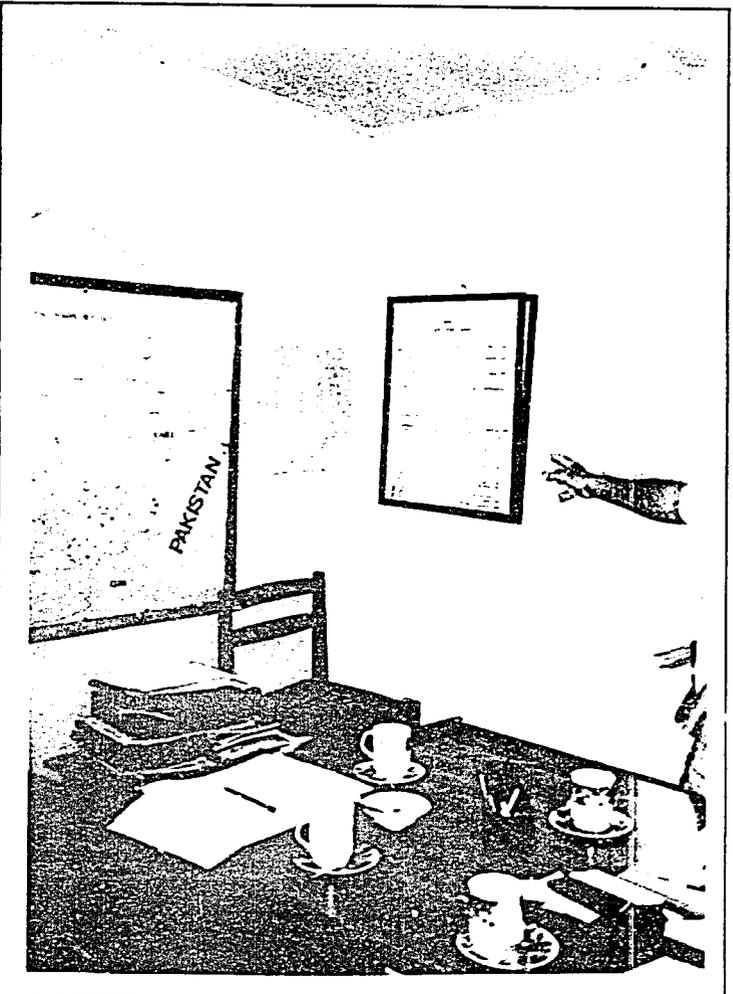


Figure 3 Quetta RONCO Office Facility. Proposed location for the BSAA equipment in corner area. Place Phone No. 1 on desk.

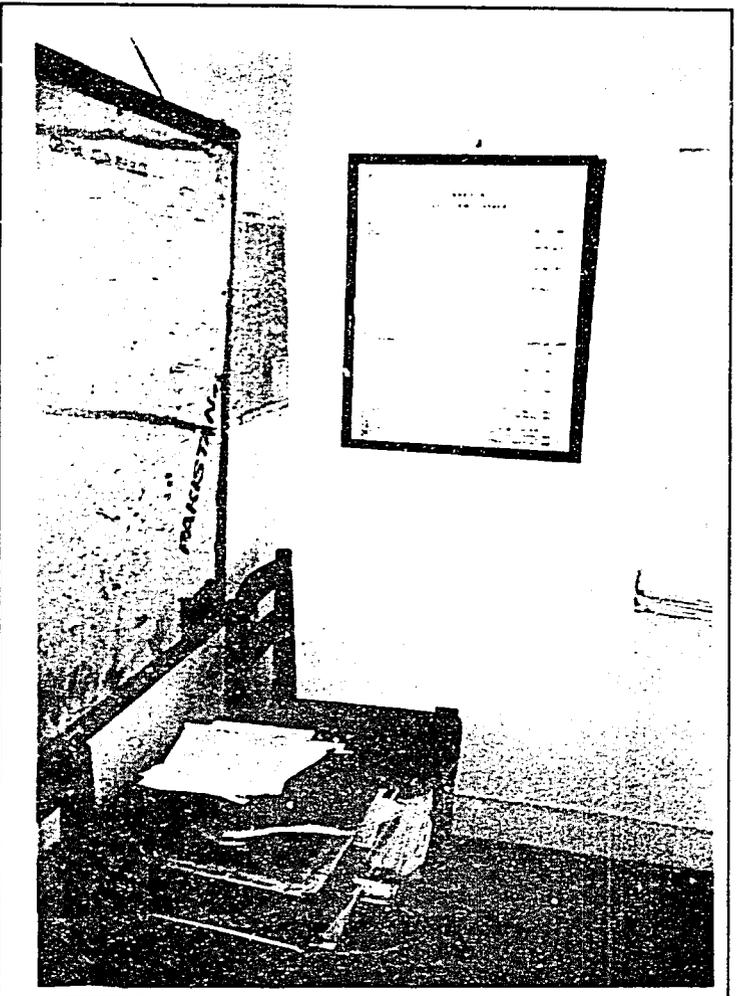


Figure 4 Quetta RONCO Office Facility. Proposed location for BSAA equipment.

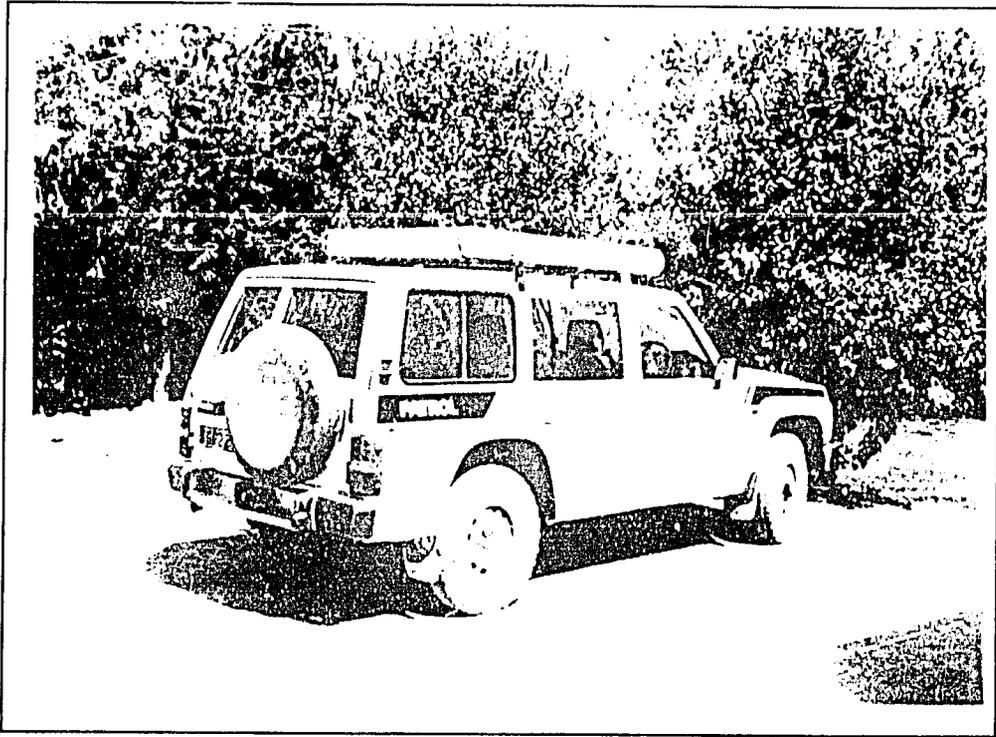


Figure 5 Quetta RONCO Office Facility. Nissan Patrol station wagon to receive mobile radio installation.

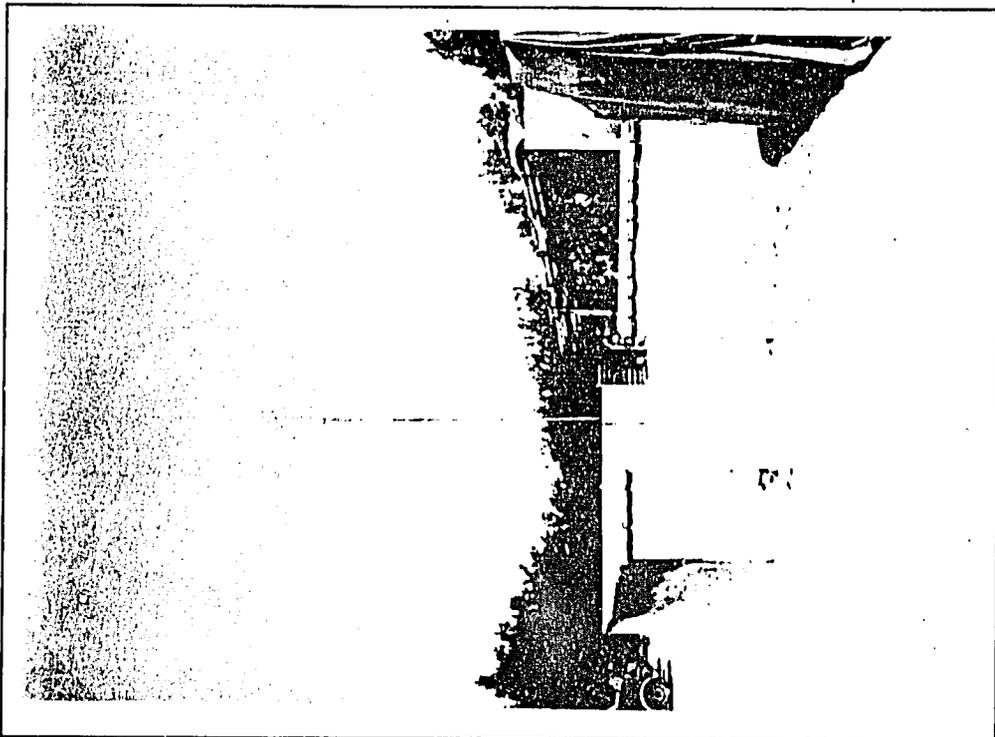
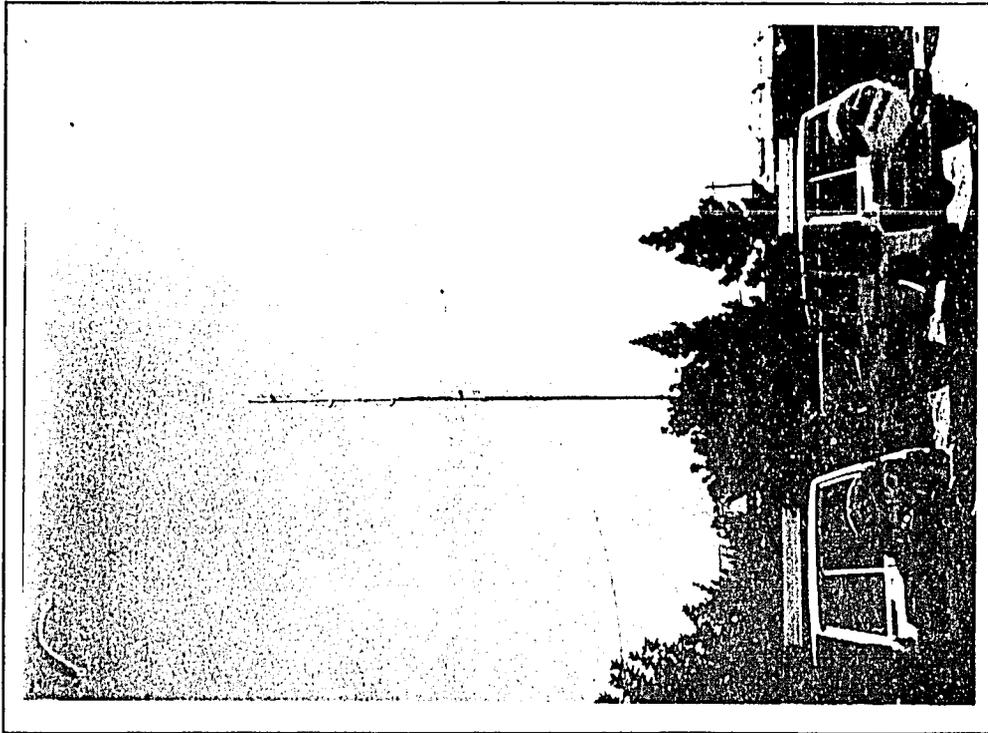
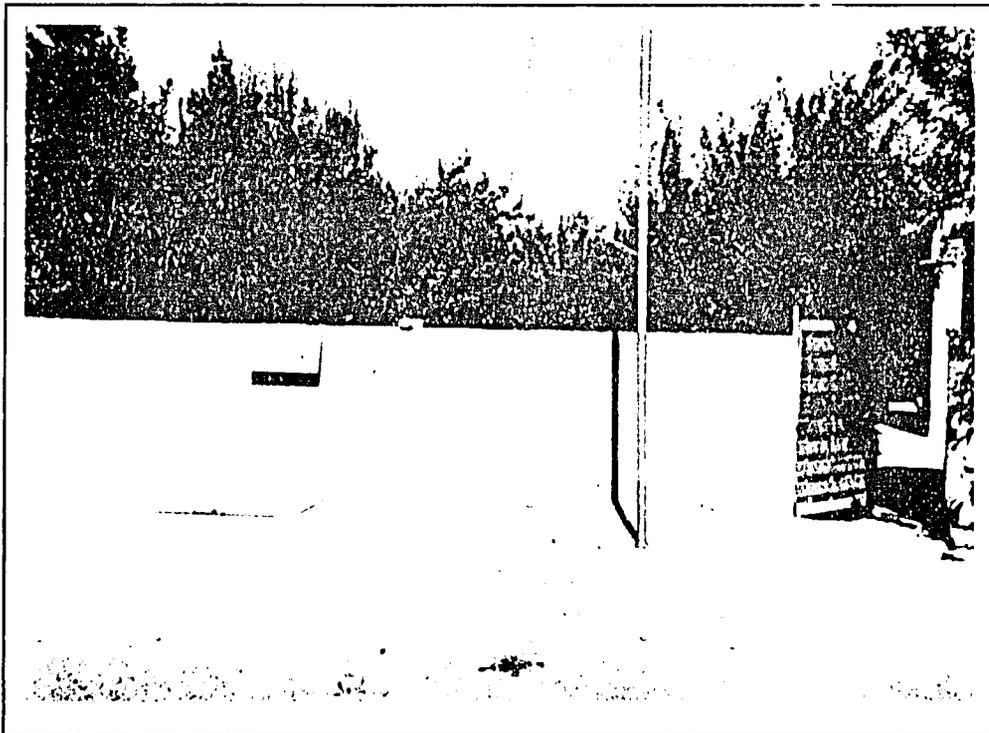


Figure 6 Quetta RONCO Office Facility. VHF CommNet antenna mast. (View Northwest).



**Figure 7** Quetta RONCO Office Facility. VHF CommNet installation (viewed facing North).



**Figure 8** Quetta RONCO Office Facility. Closeup of VHF mast installation.

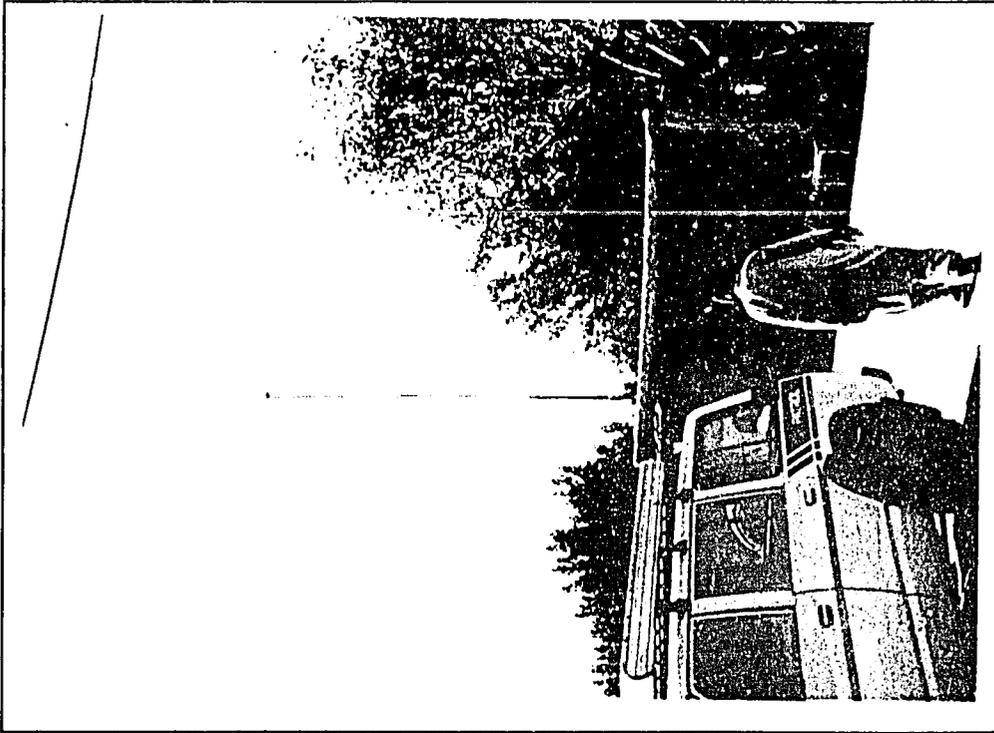


Figure 9 Quetta RONCO Office Facility. Antenna located south of the RONCO facility.

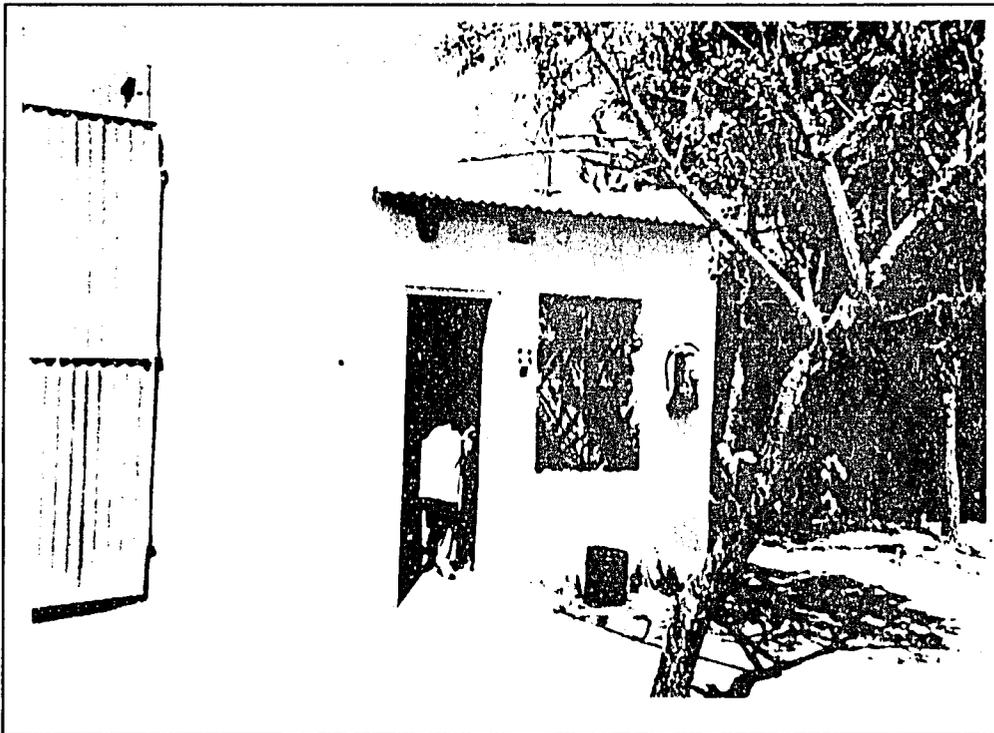


Figure 10 Quetta RONCO Office Facility. Dispatcher's Office. at main gate.

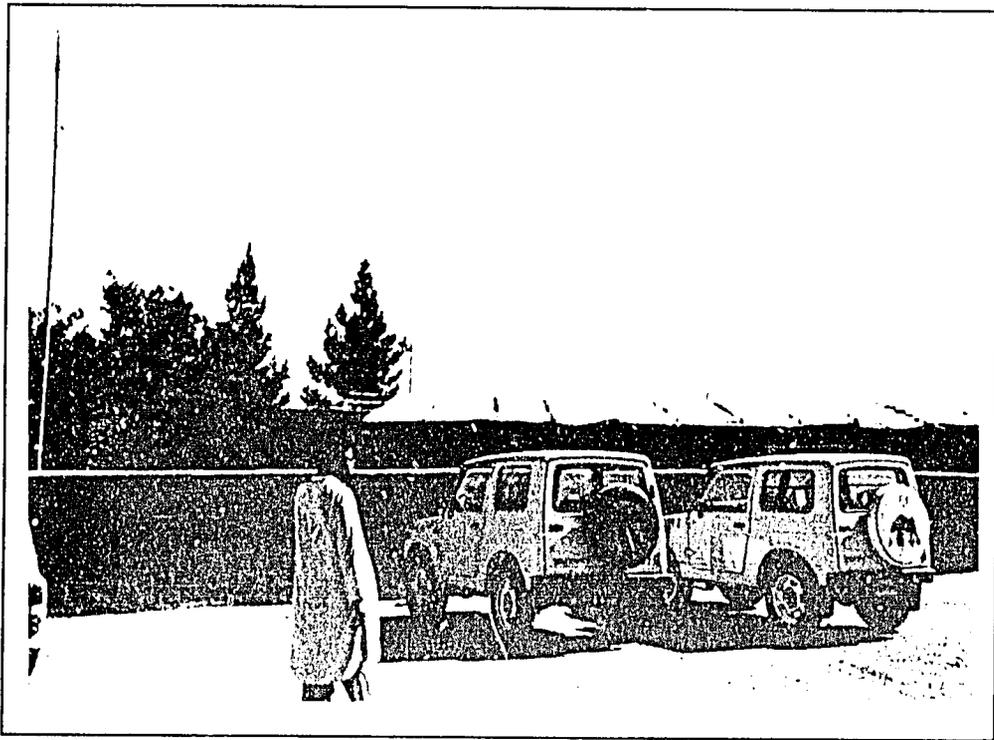


Figure 11 Quetta RONCO Office Facility. MDC dog kennels.

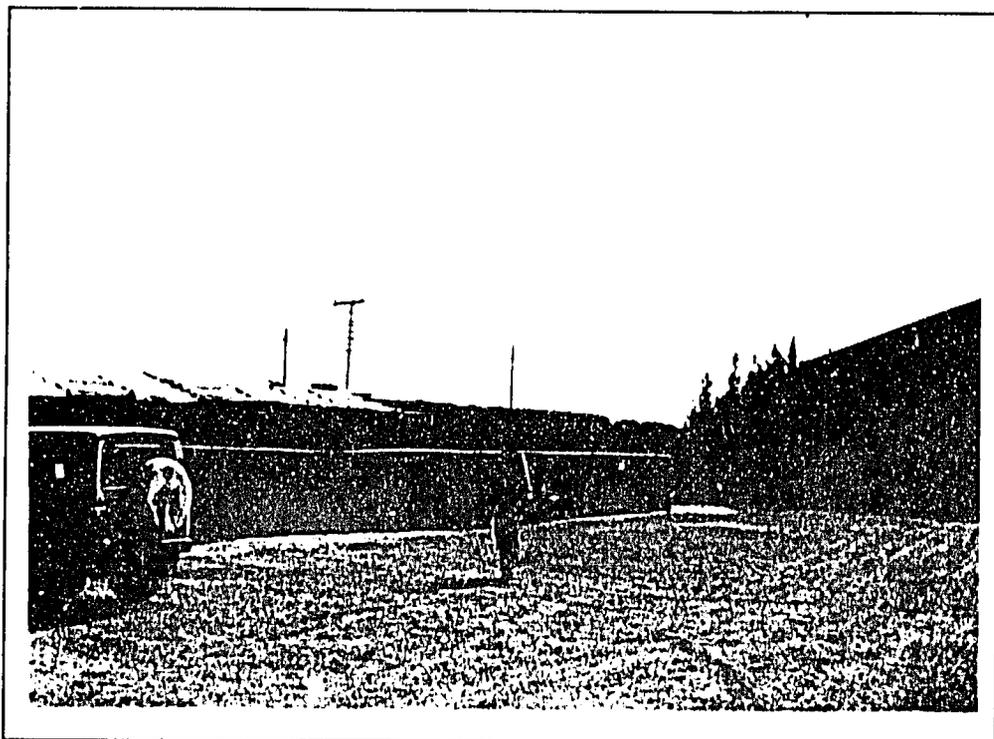


Figure 12 Quetta RONCO Office Facility. MDC dog kennels and portion of RONCO warehouse. (Facing north northeast).

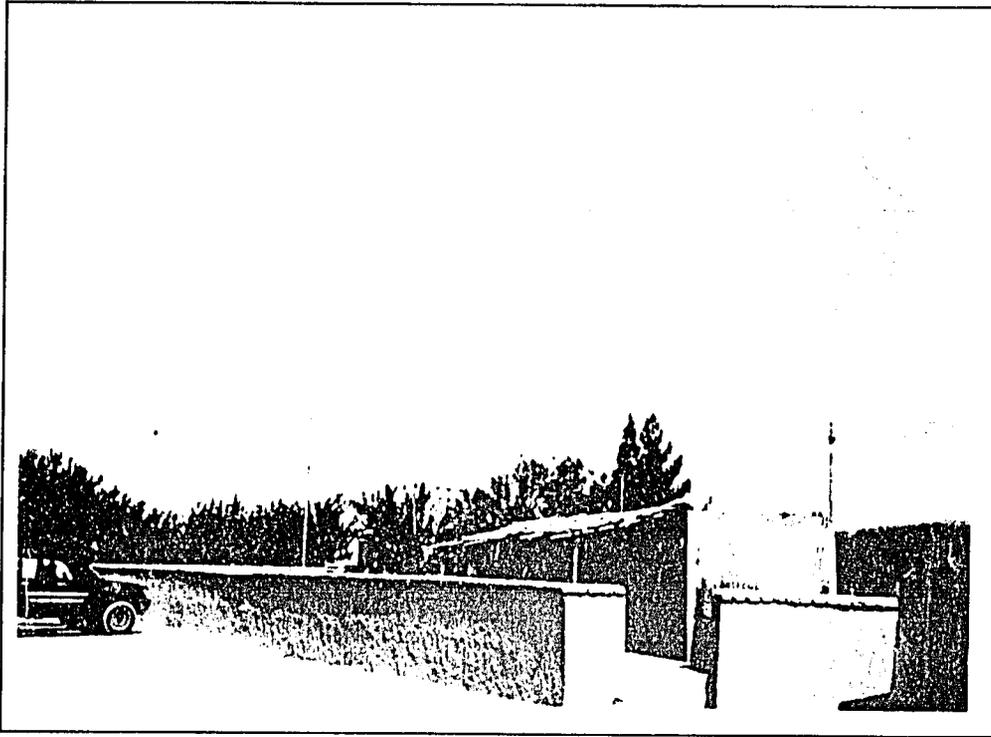


Figure 13 Quetta RONCO Office Facility. MDC kennels and compound.

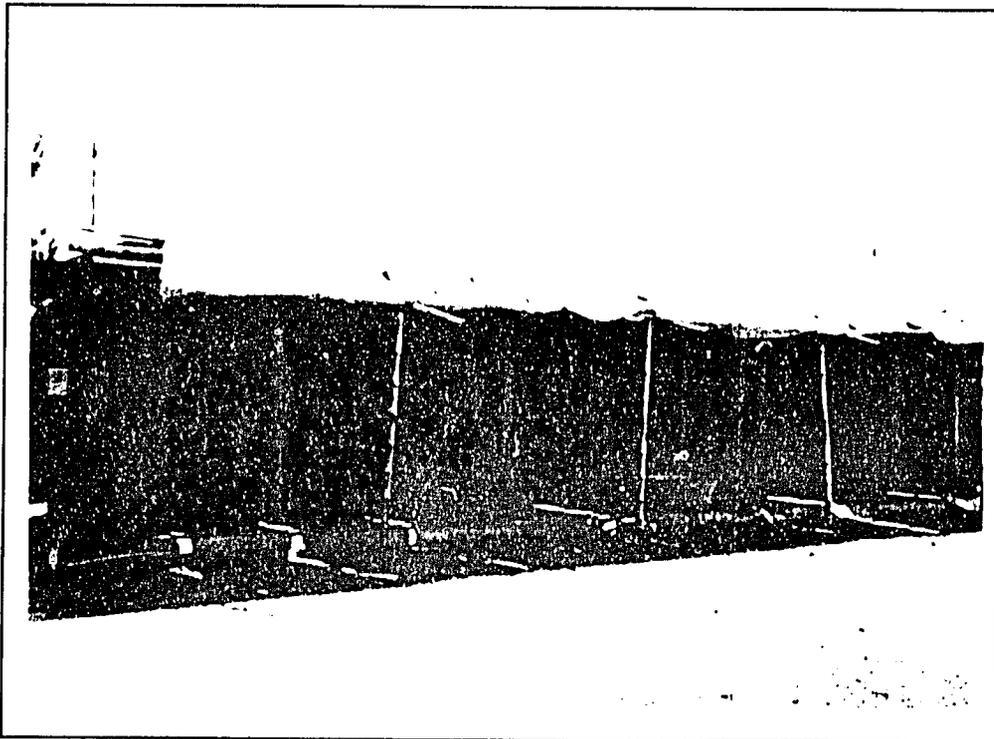


Figure 14 Quetta RONCO Office Facility. MDC kennel closeup.

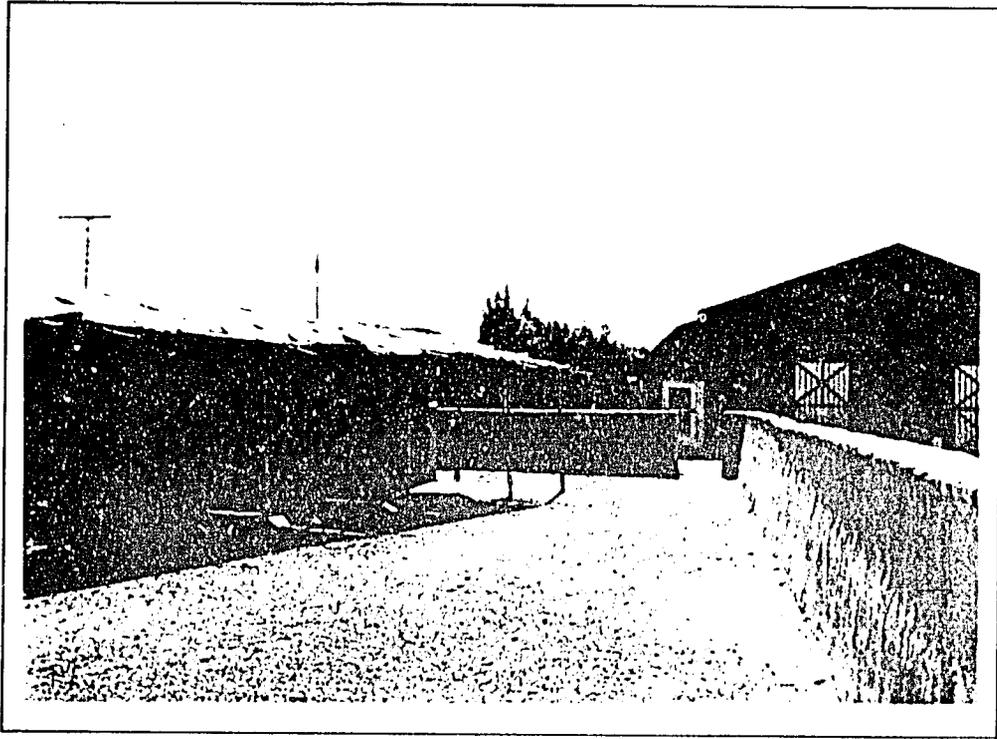


Figure 15 Quetta RONCO Office Facility. Warehouse facility facing east.

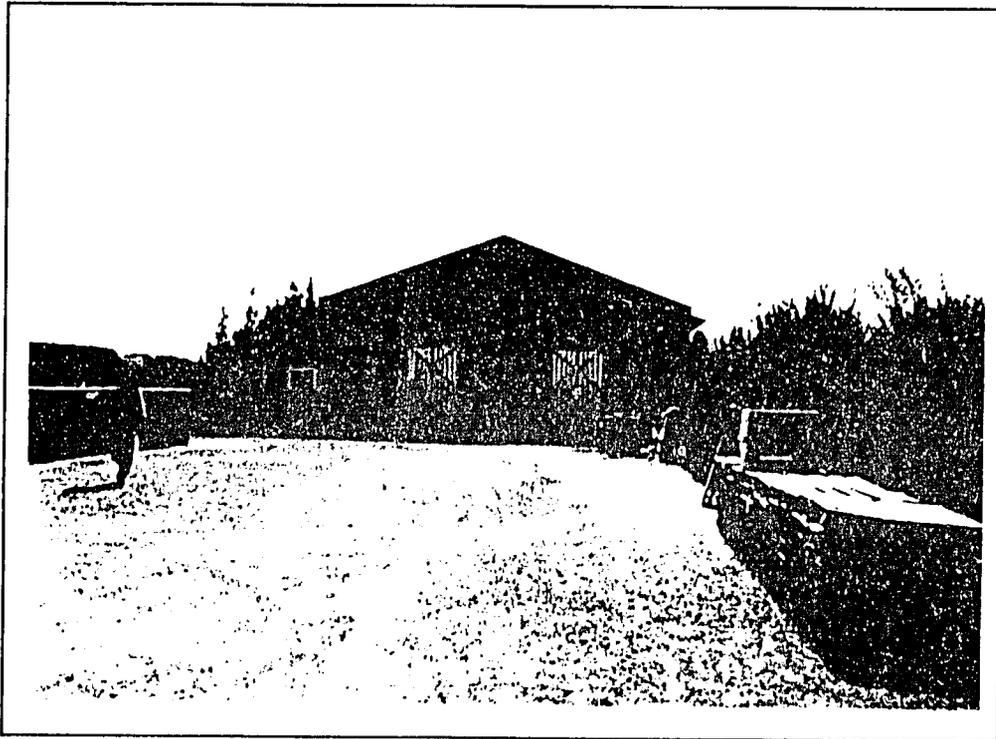


Figure 16 Quetta RONCO Office Facility. Warehouse.

Site Photographs

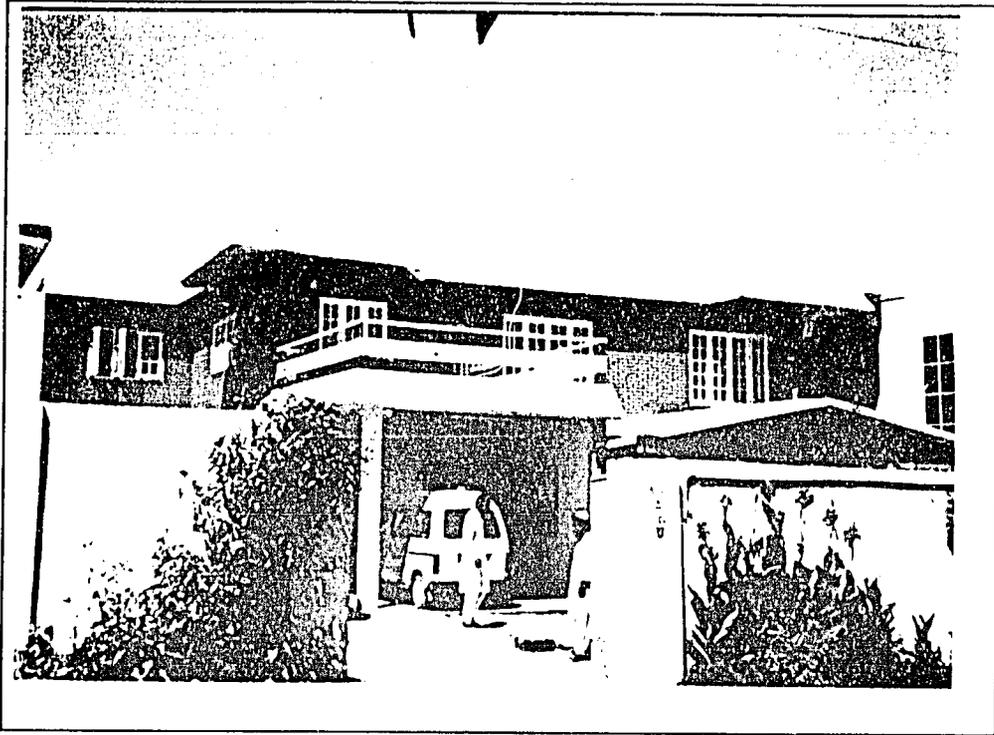


Figure 1 Quetta DAI Office.

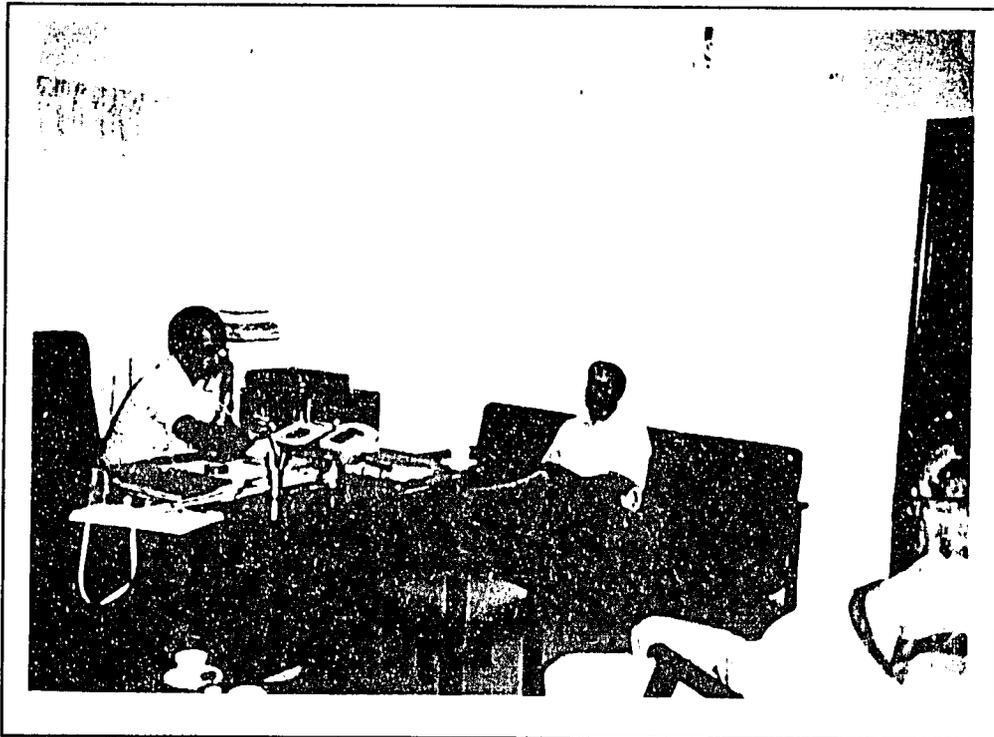


Figure 2 Quetta DAI Office. BSAA to be located in this office.

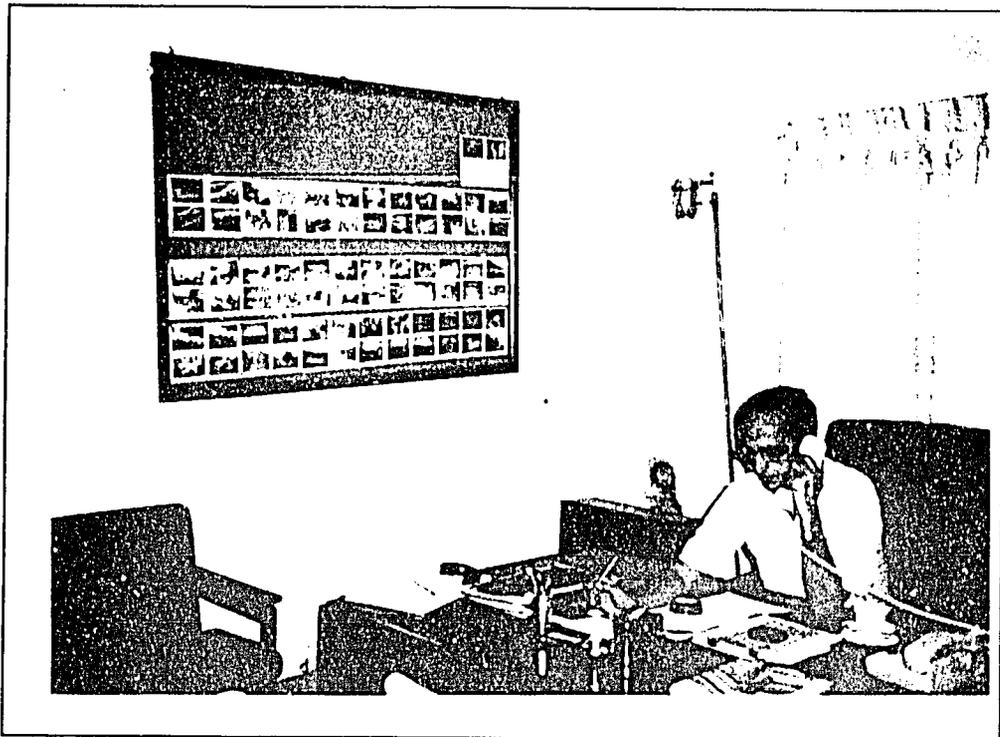


Figure 3 Quetta DAI Office. BSAA equipment to be located in corner. Phone #1 to be placed on desk adjacent to existing phones.

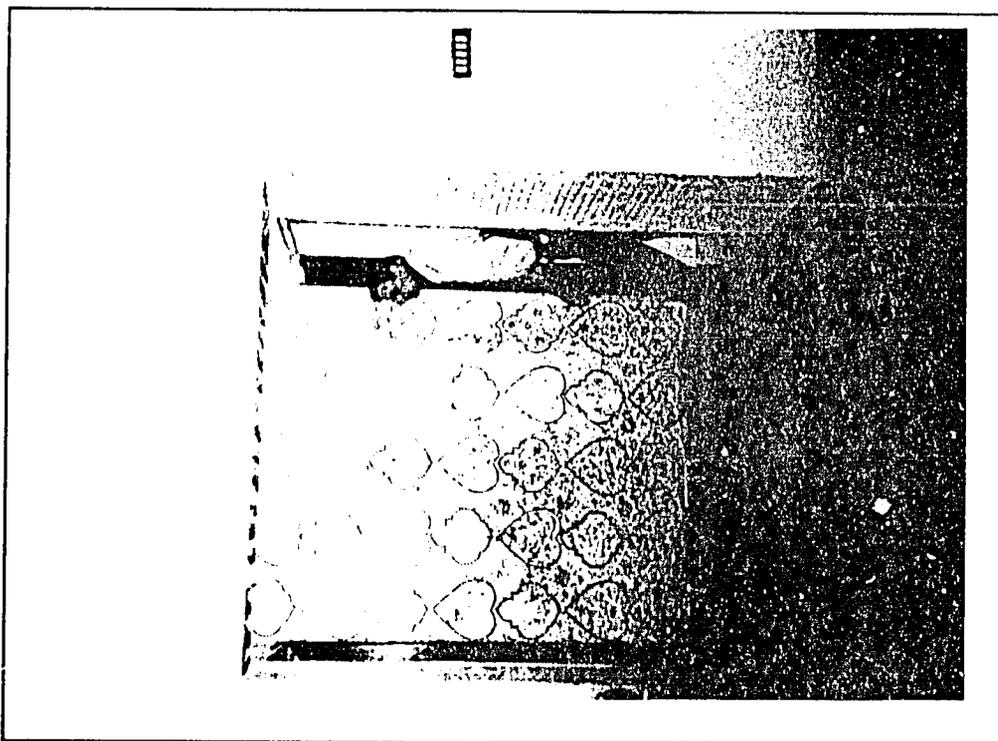


Figure 4 Quetta DAI Office. Hallway separating COP office with Administrator's office on left.

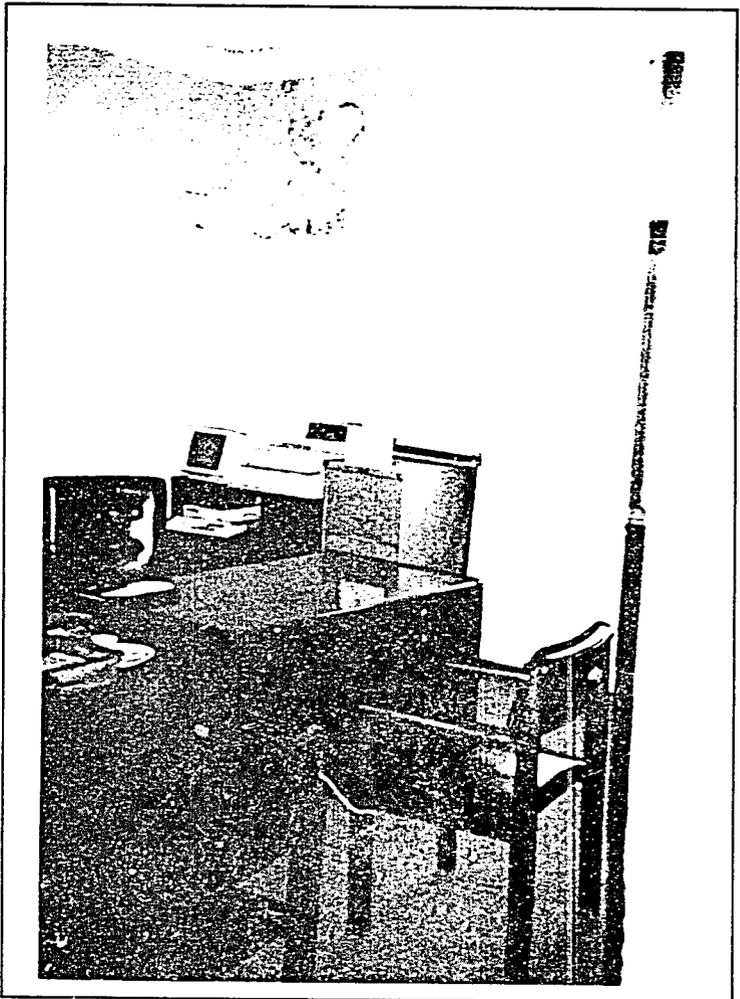


Figure 5 Quetta DAI Office. View of Administrator's office.

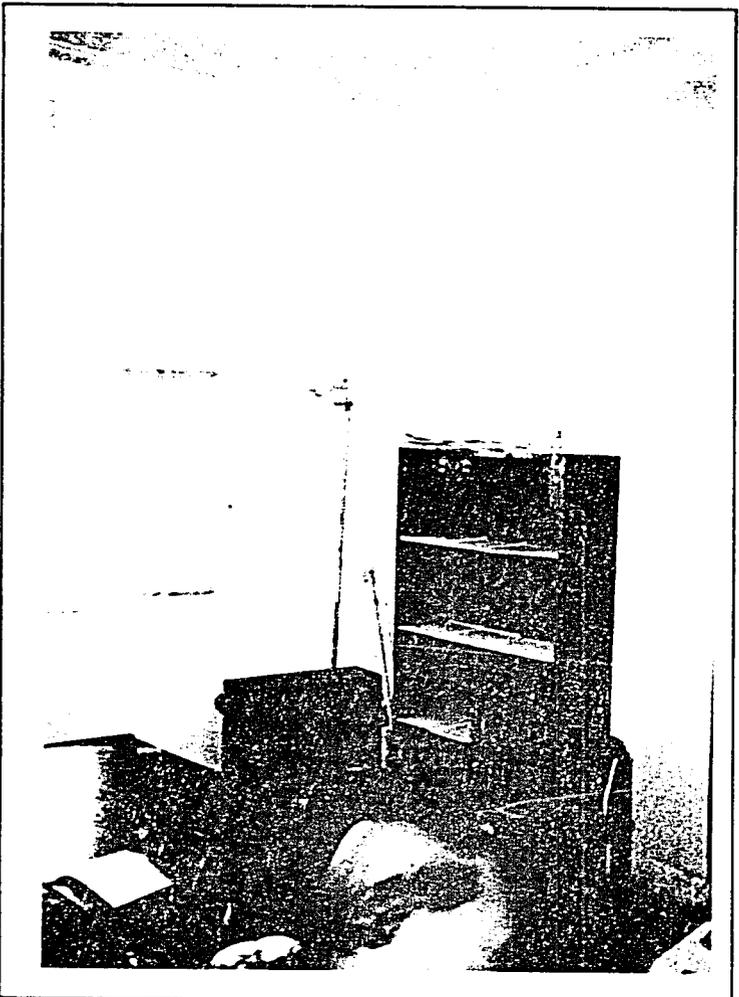
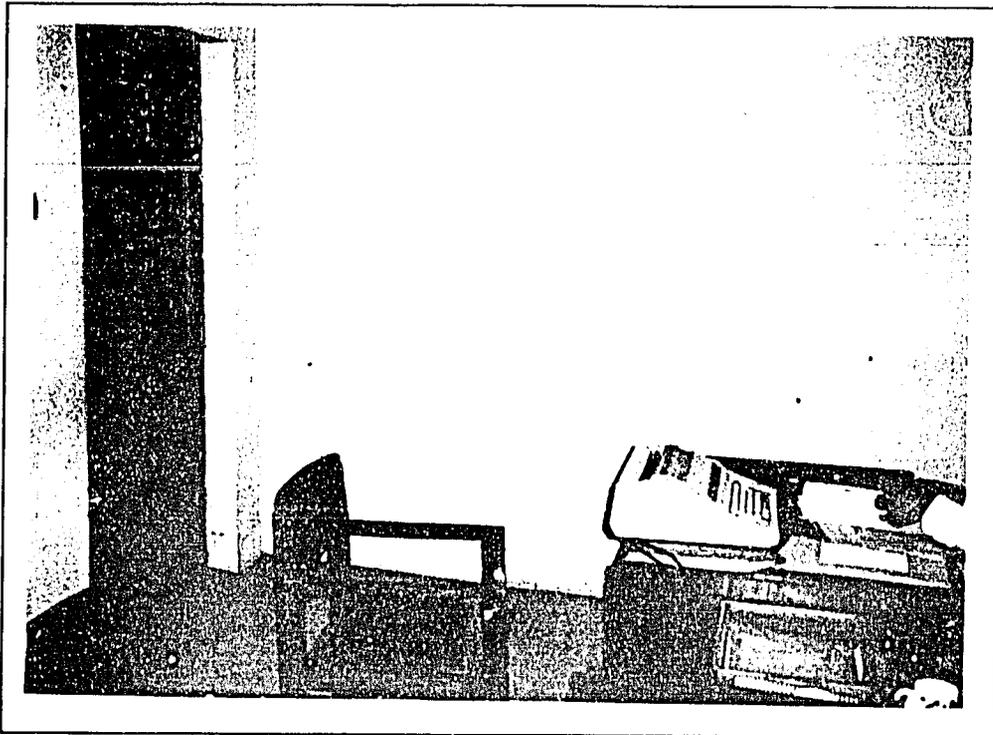
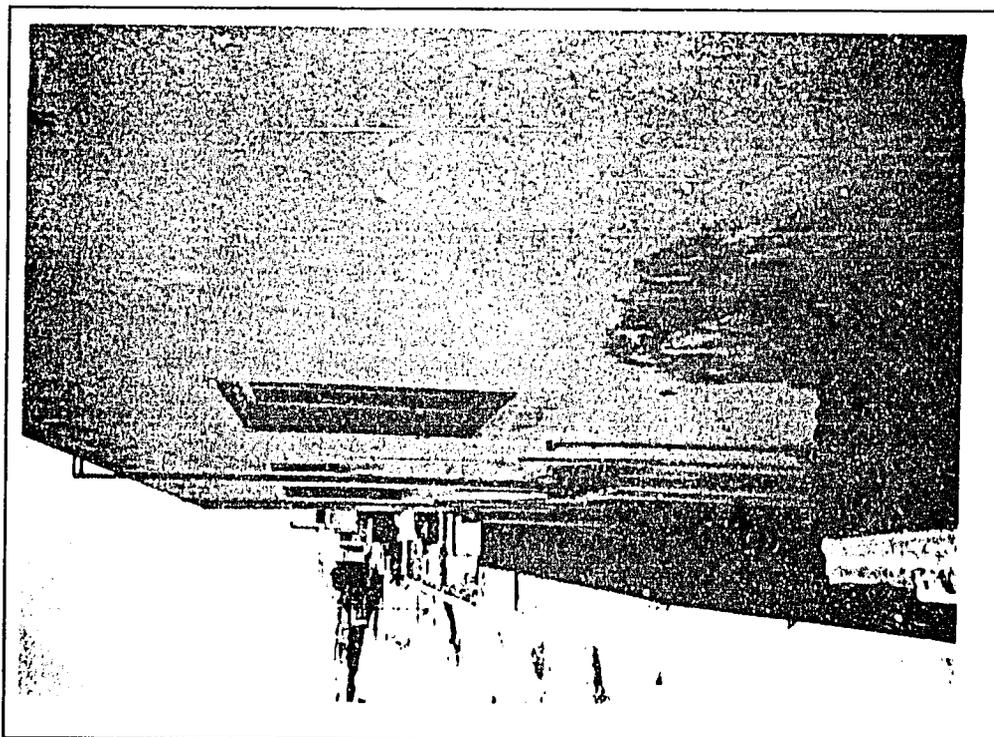


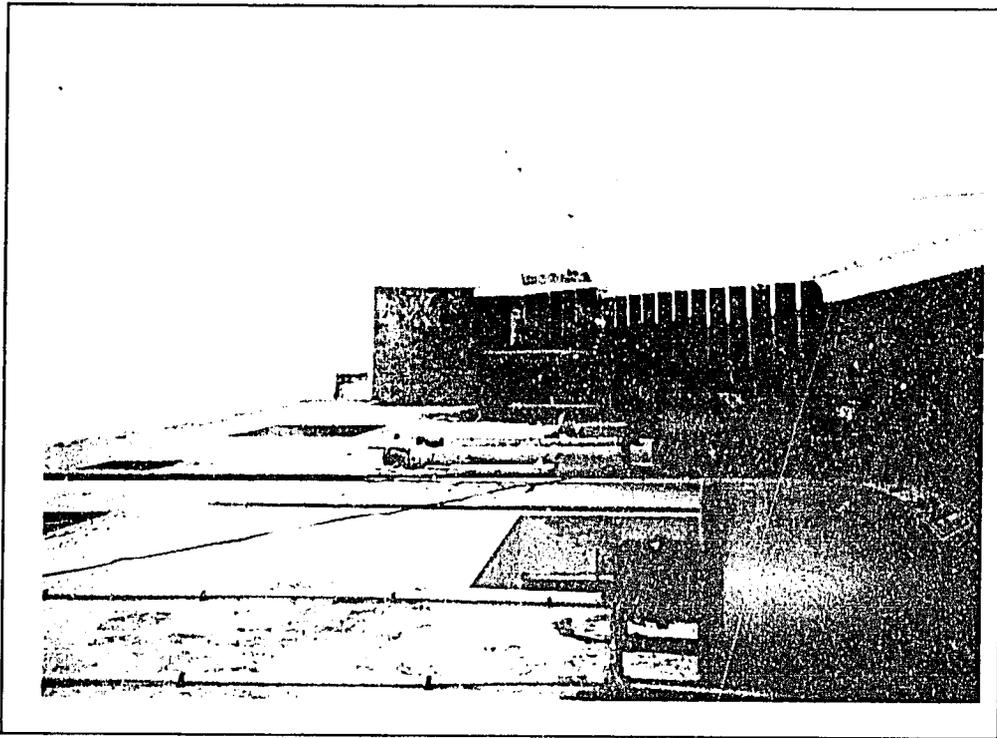
Figure 6 Quetta DAI Office. Administrator's office.



**Figure 7** Quetta DAI Office. Run cable along bottom of wall after entry through door jamb. Place Phone #2 on desk.



**Figure 8** Quetta DAI Office. Propose attaching antenna support pipe to side of wall. Photograph taken in general direction of proposed Base Station location.



**Figure 9** Quetta DAI Office. View of proposed location of the antenna support mast.

Site Photographs

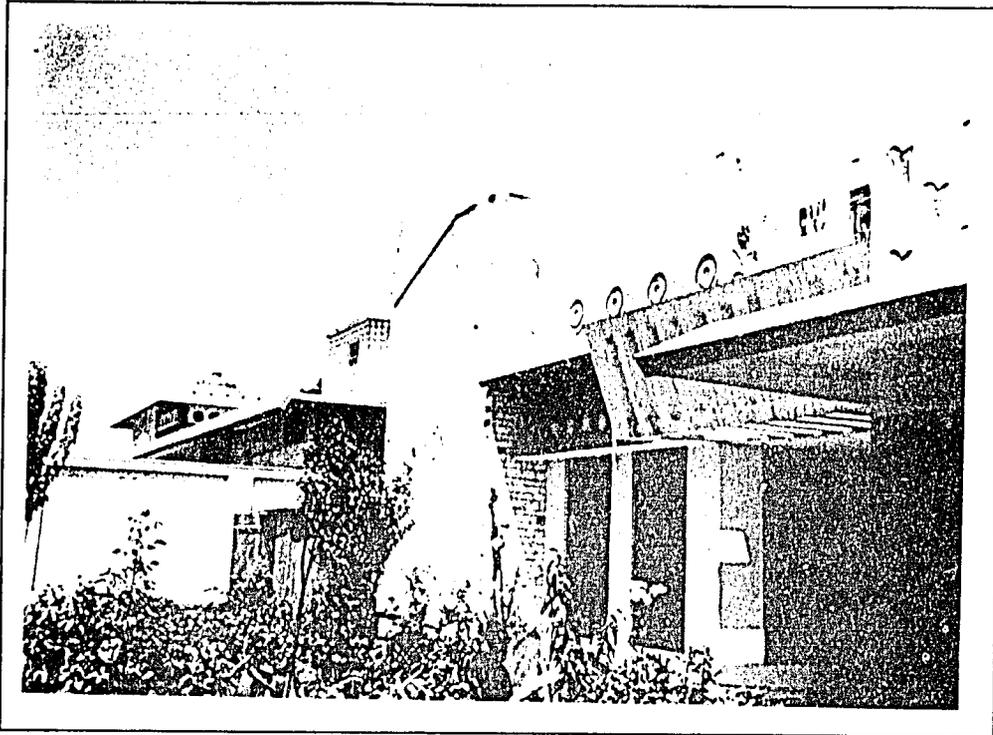


Figure 1 Quetta UNO Office Facility. Front section of building (facing North).

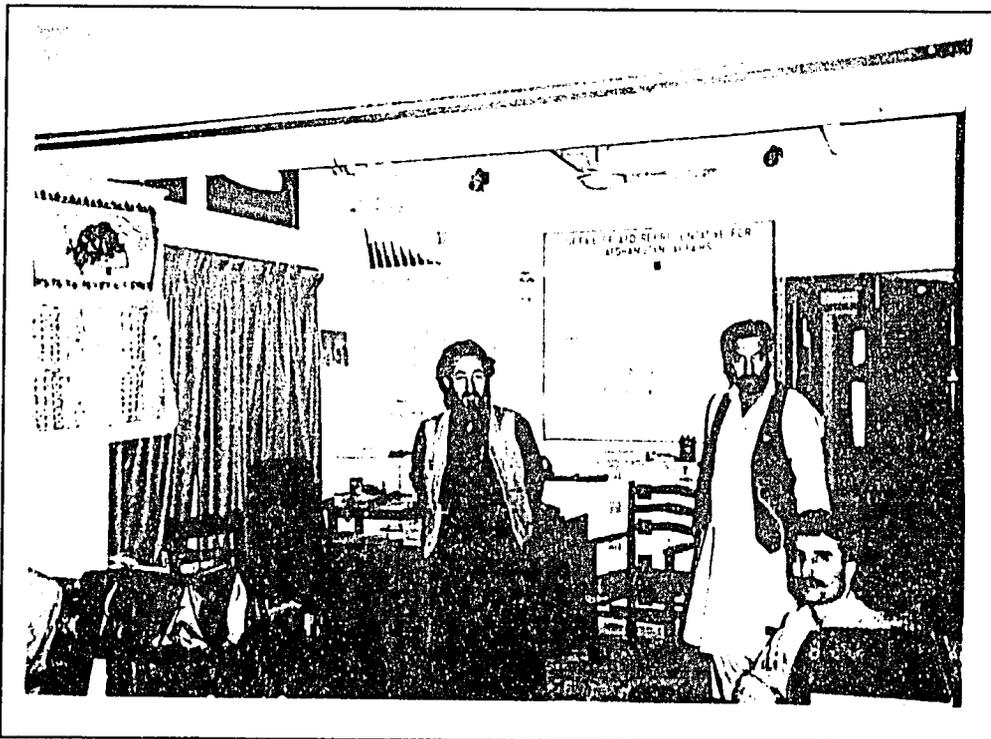


Figure 2 Quetta UNO Office Facility. Director's Office.

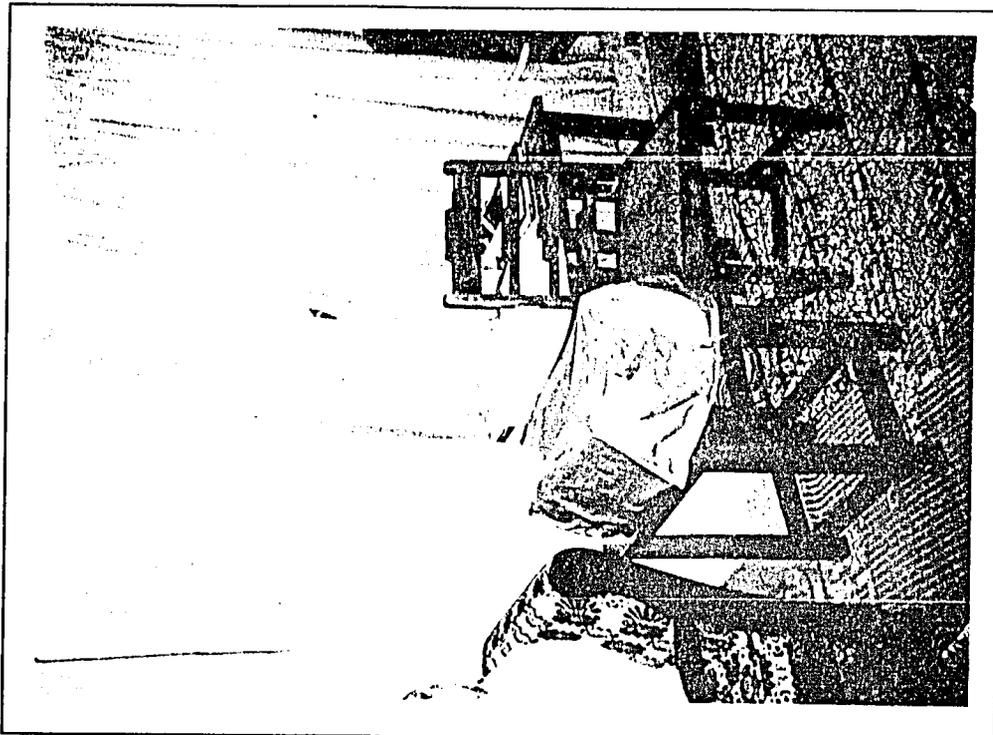


Figure 3 Quetta UNO Office Facility. Proposed location for BSAA equipment, adjacent to Director's desk.

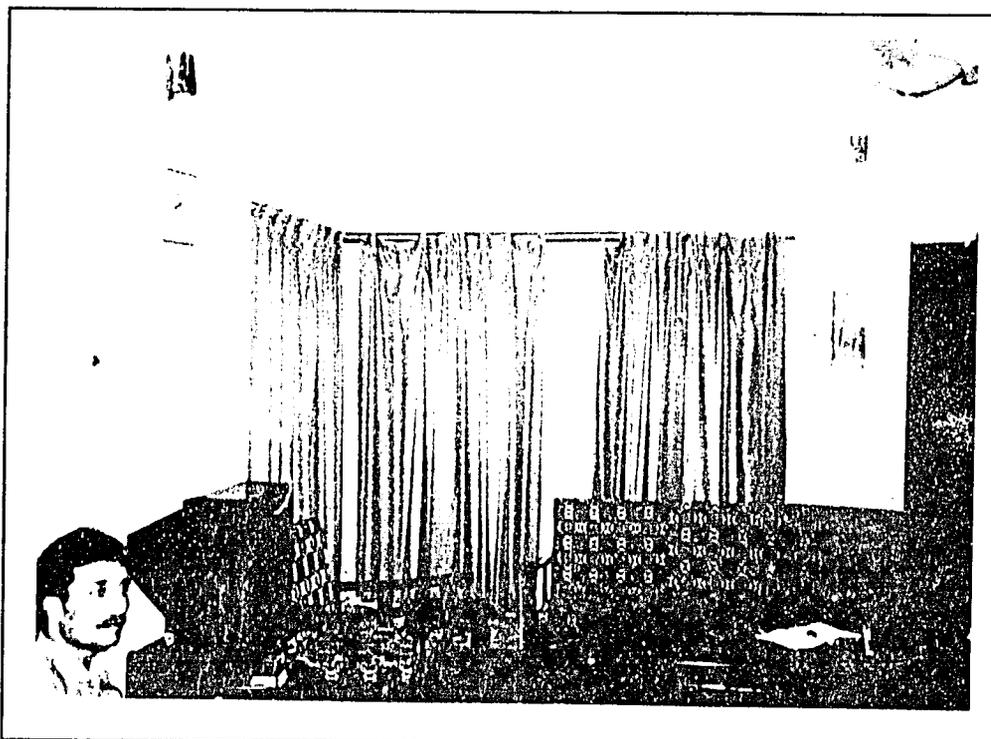


Figure 4 Quetta UNO Office Facility. Meeting area (part of Director's Office).

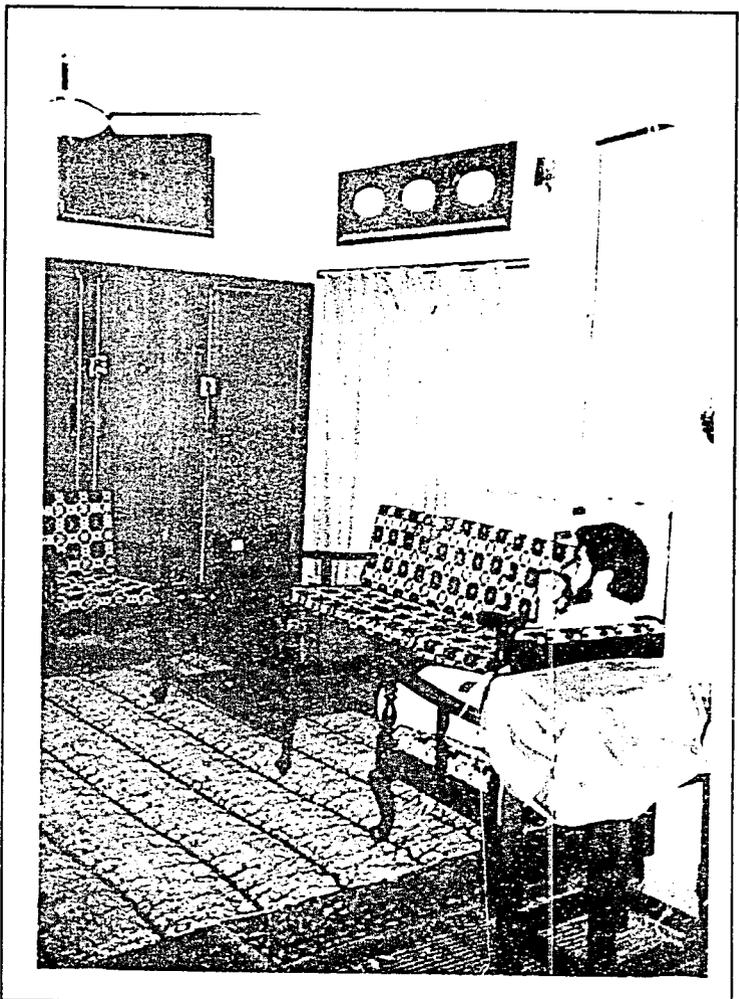


Figure 5 Quetta UNO Office Facility. Meeting room (off Director's office).

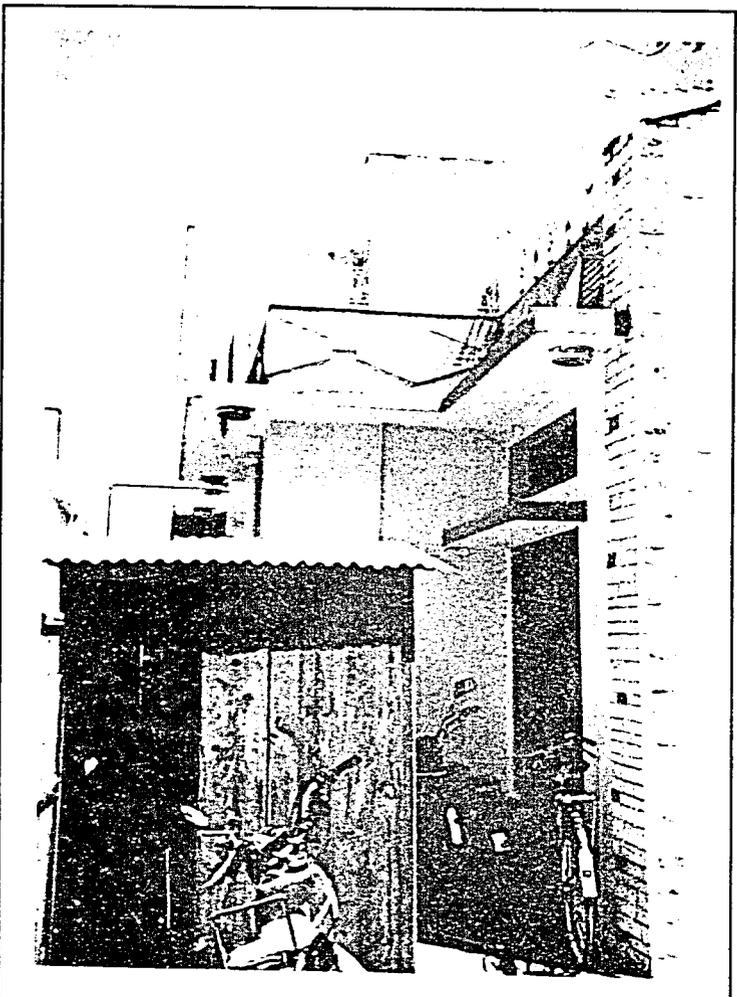


Figure 6 Quetta UNO Office Facility. North wall of building.

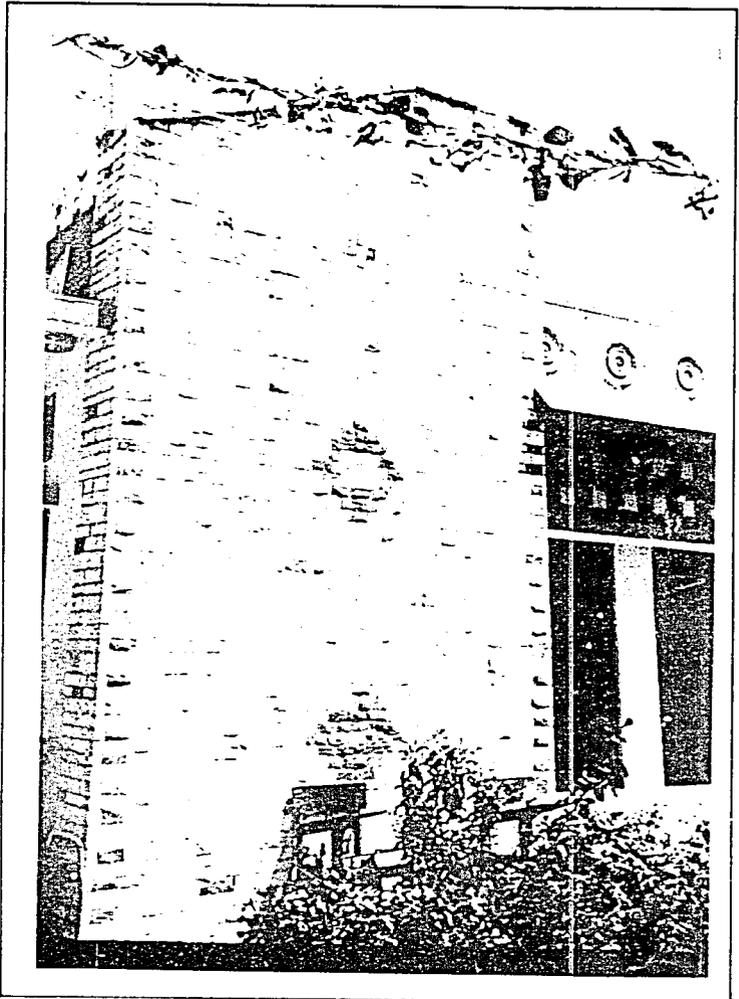


Figure 7 Quetta UNO Office Facility. Front section of building, entrance on right.

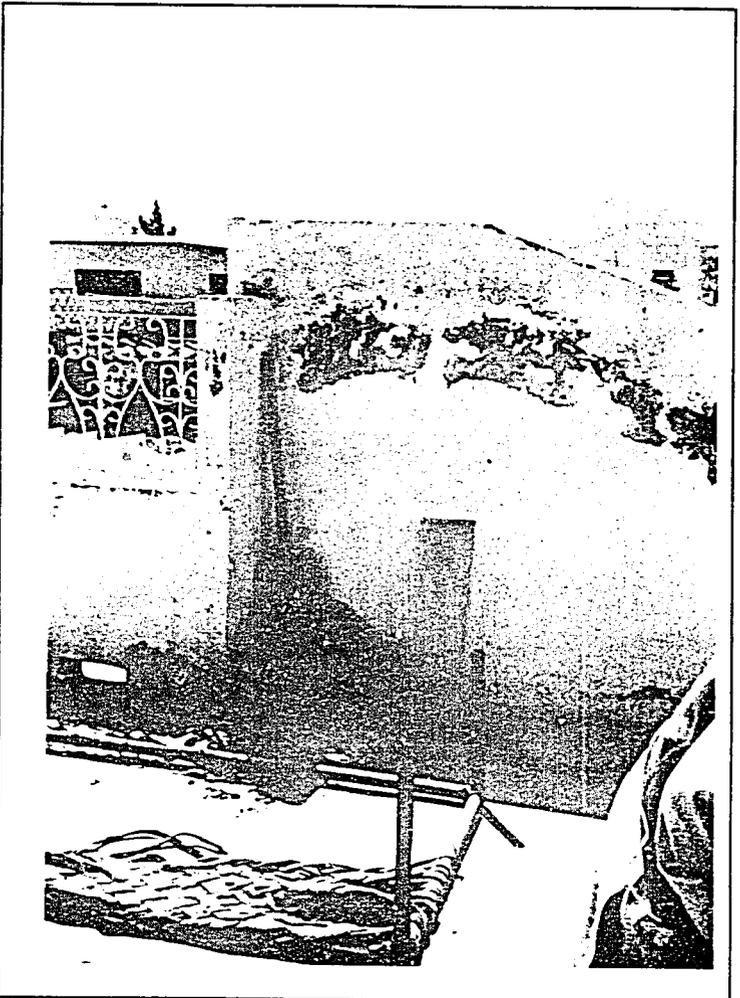


Figure 8 Quetta UNO Office Facility. Possible location for pipe mast (facing south southwest).

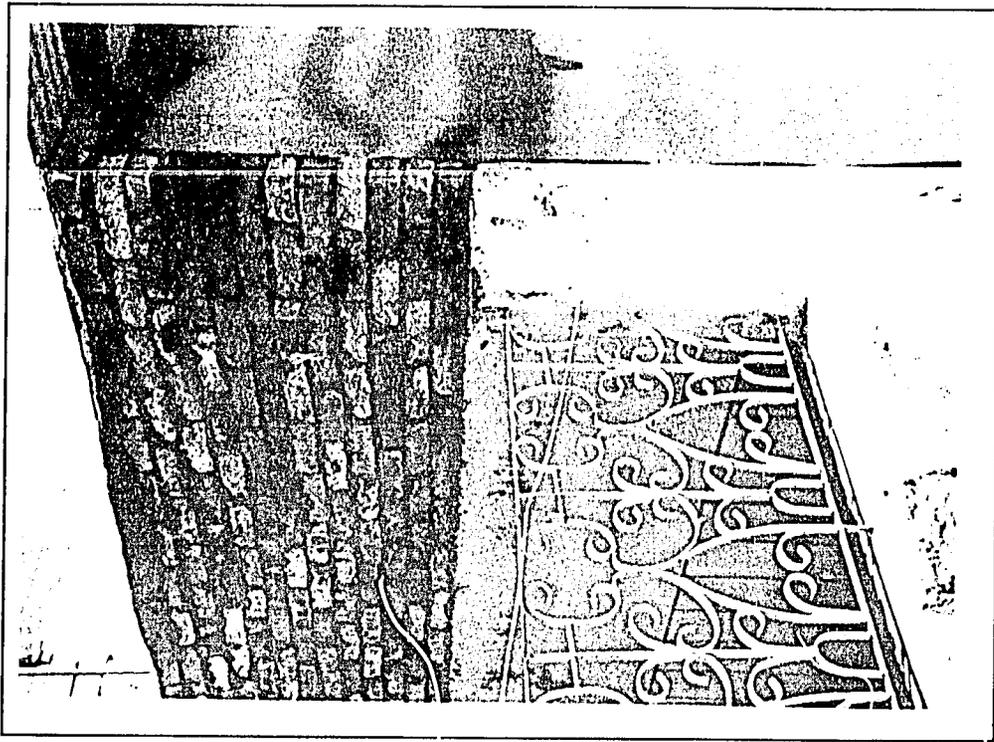


Figure 9 Quetta UNO Office Facility. Optional location for antenna mast. Structure is faced brick.

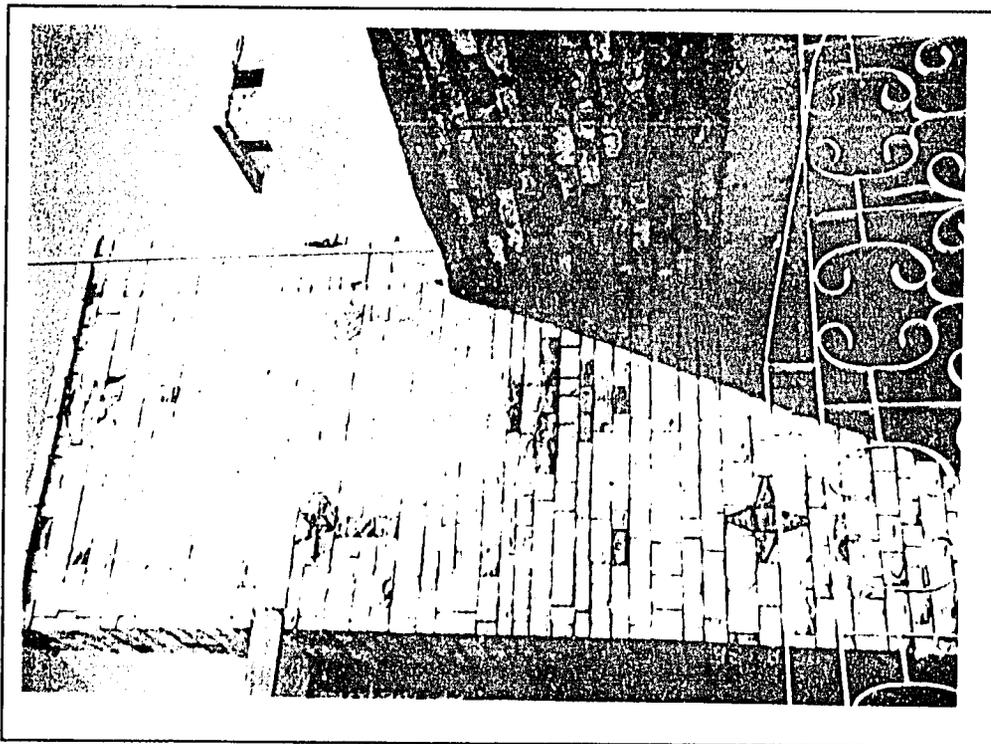


Figure 10 Quetta UNO Office Facility. Optional location detail.



Figure 11 Quetta UNO Office Facility. Optional mast location (alternate view).

Site Photographs

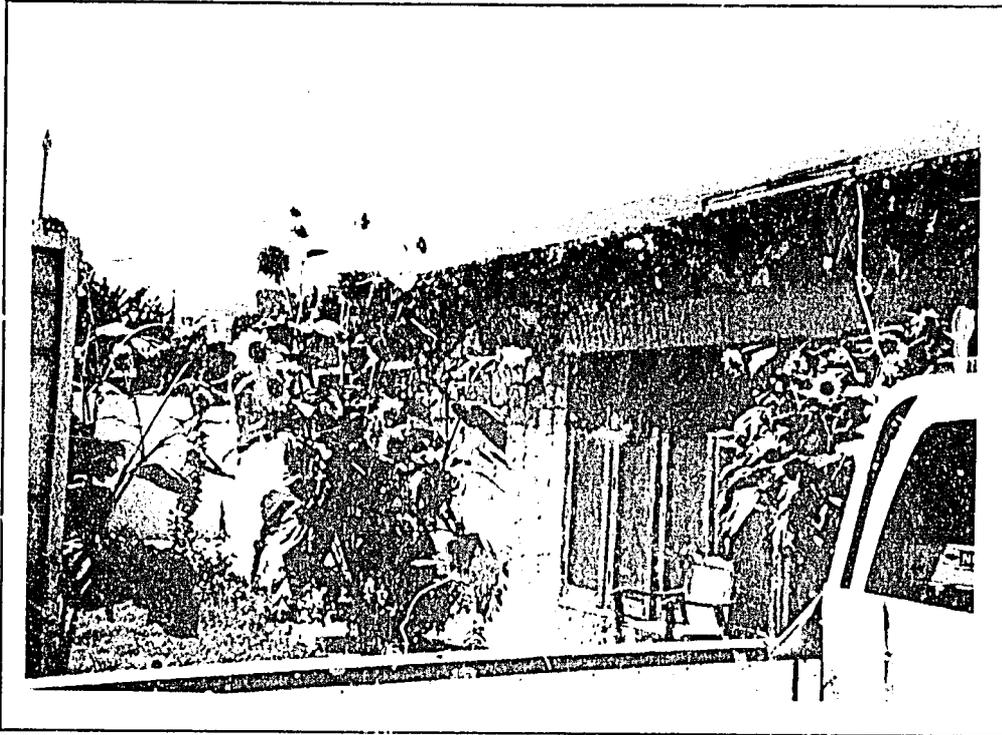


Figure 1 Quetta MSH Office Facility. COP's office in left corner of photo.

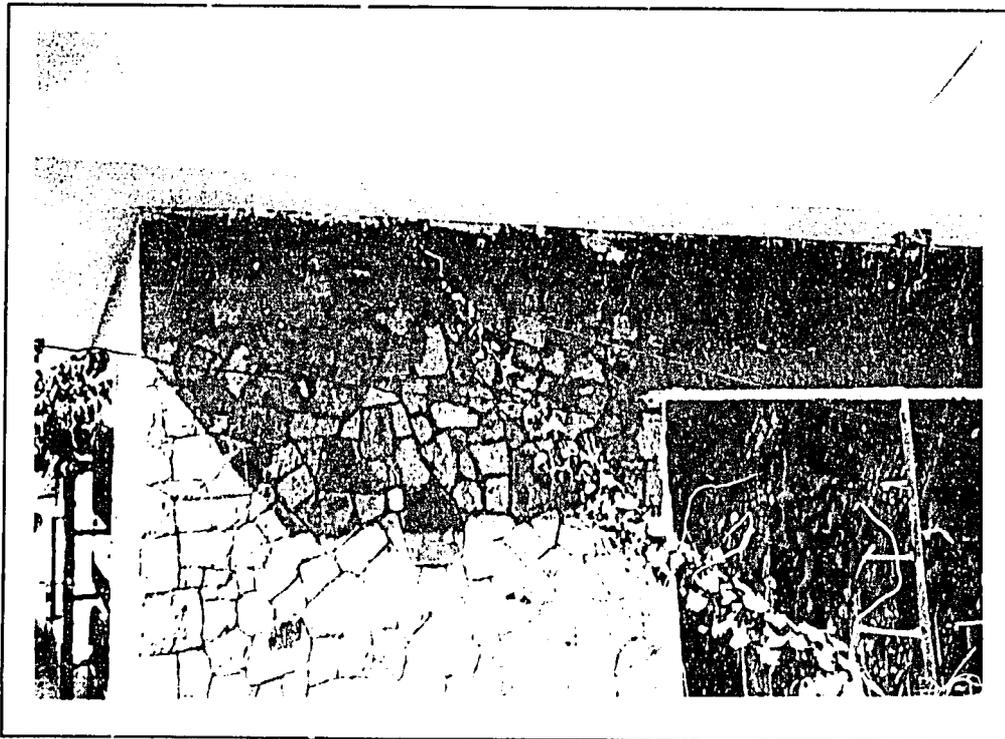


Figure 2 Quetta MSH Office Facility. Closeup of COP's office wall.

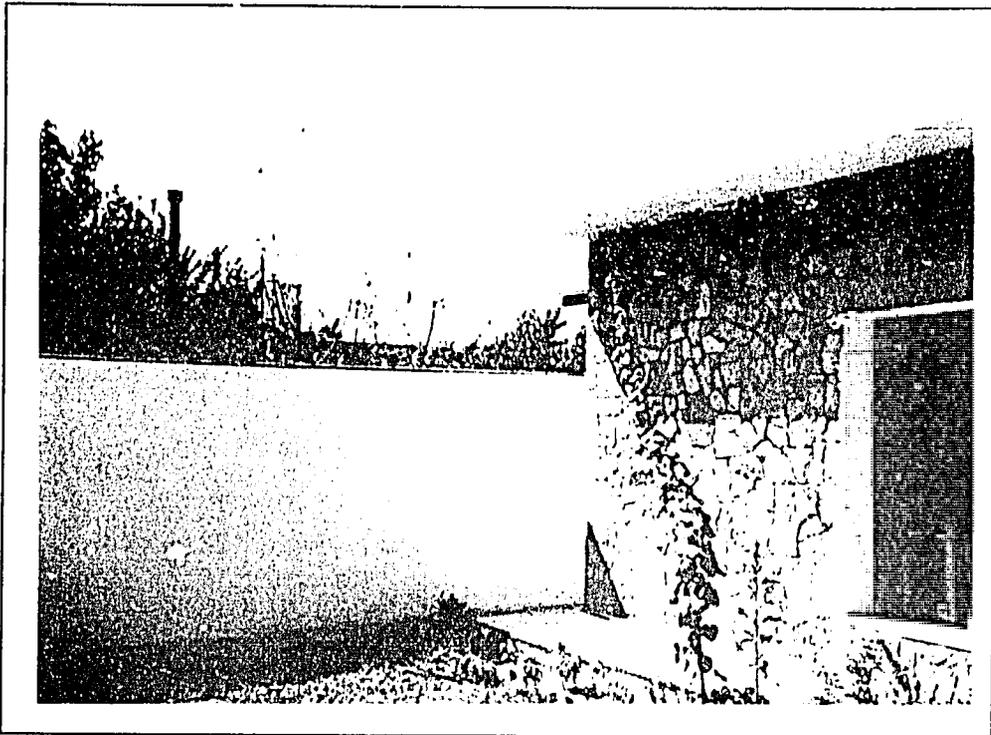


Figure 3 Quetta MSH Office Facility. View of west wall and COP's office wall.

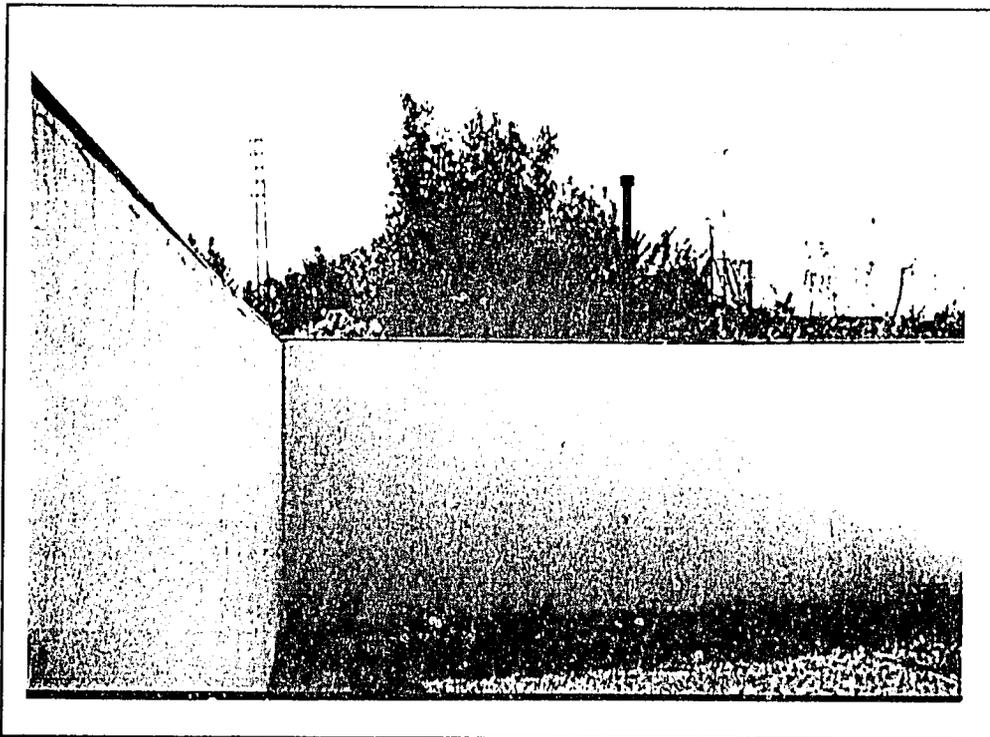


Figure 4 Quetta MSH Office Facility. West wall of compound.

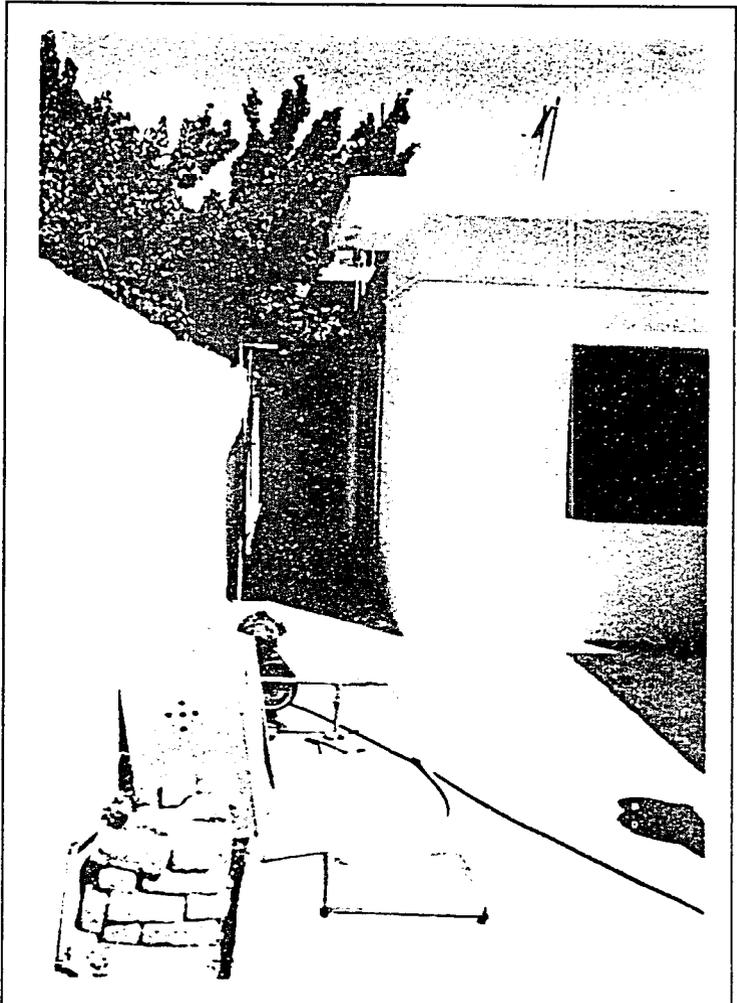


Figure 5 Quetta MSH Office Facility. Rear section of building compound.



Figure 6 Quetta MSH Office Facility. Main entrance to building.

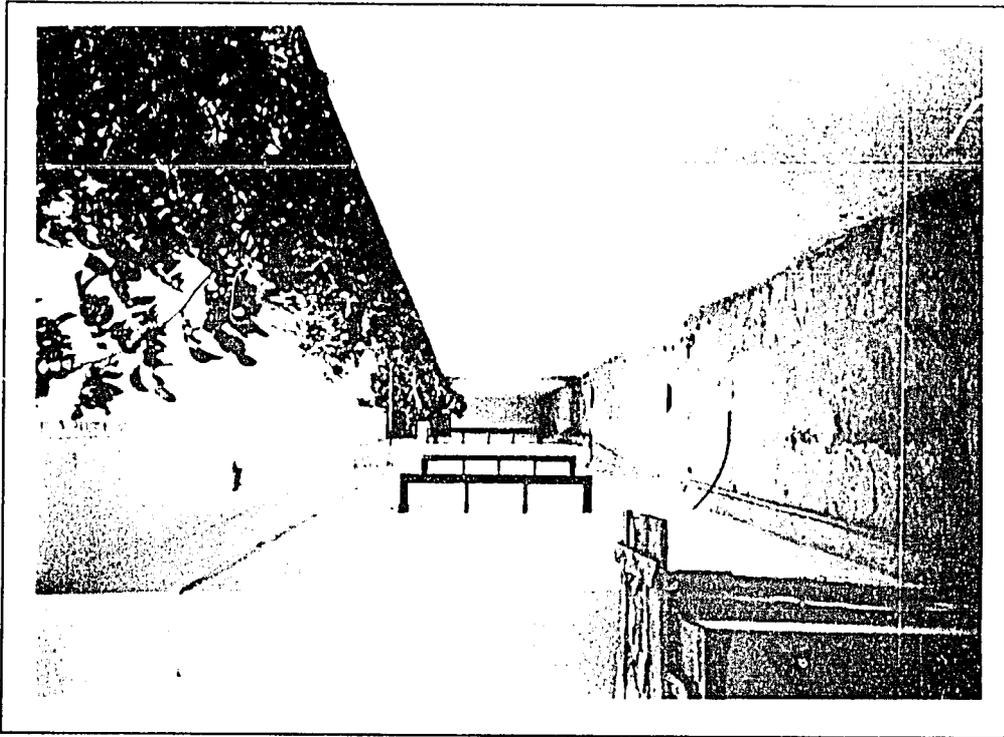


Figure 7 Quetta MSH Office Facility. West side of compound.

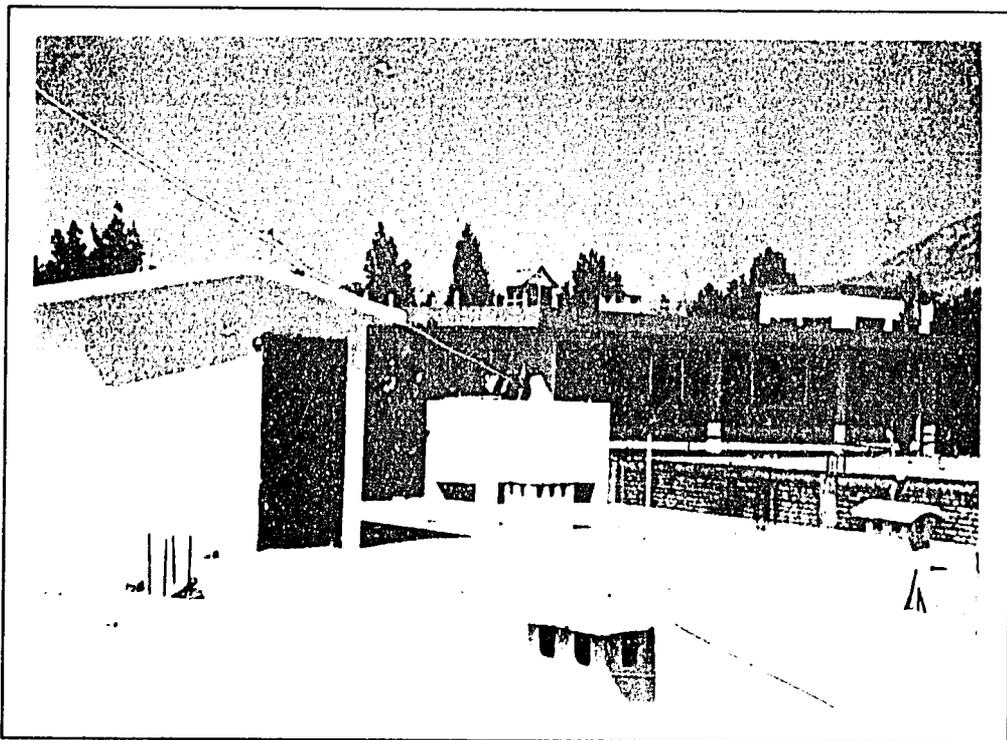


Figure 8 Quetta MSH Office Facility. View looking North. Entrance to roof area on left.

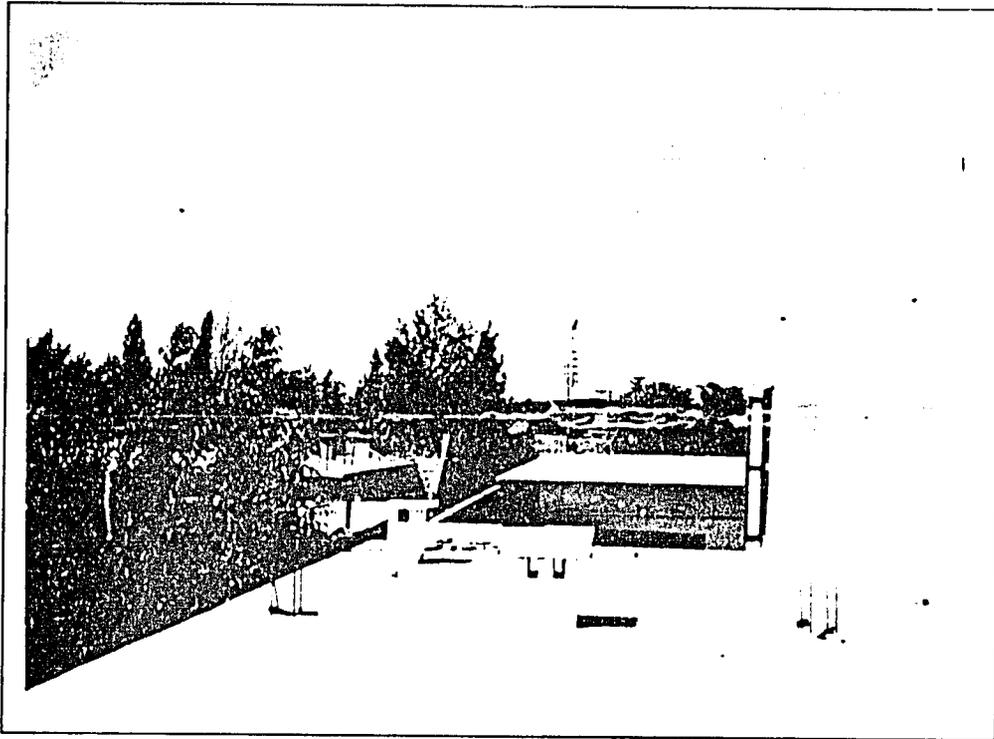


Figure 9 Quetta MSH Office Facility. Roof top view looking North Northwest.

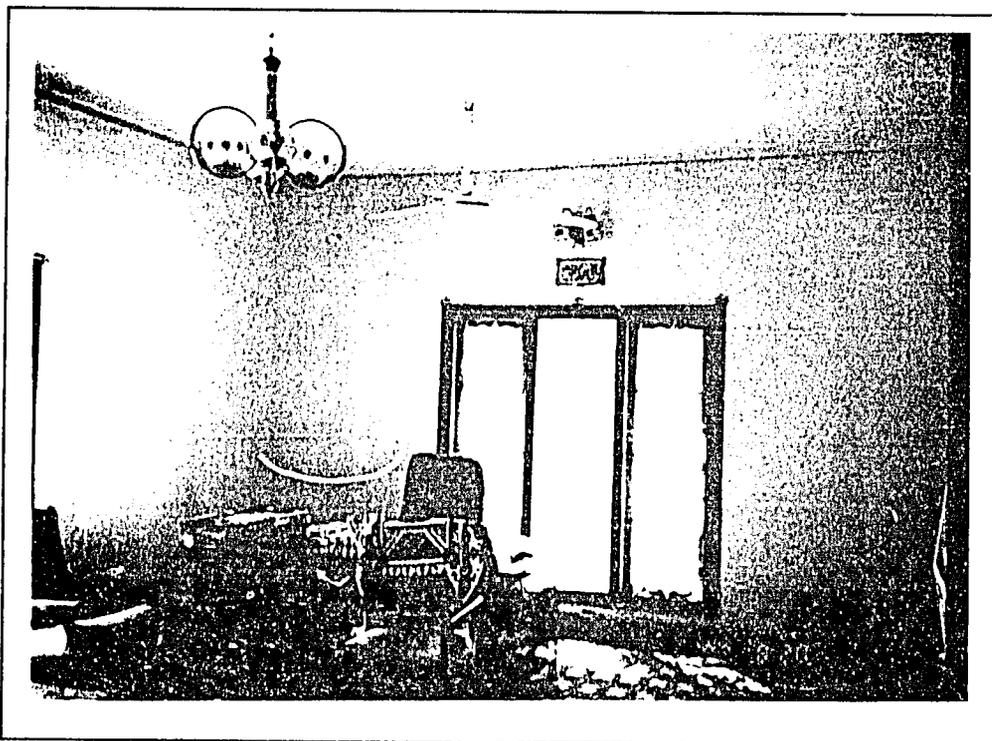


Figure 10 Quetta MSH Office Facility. COP's office.

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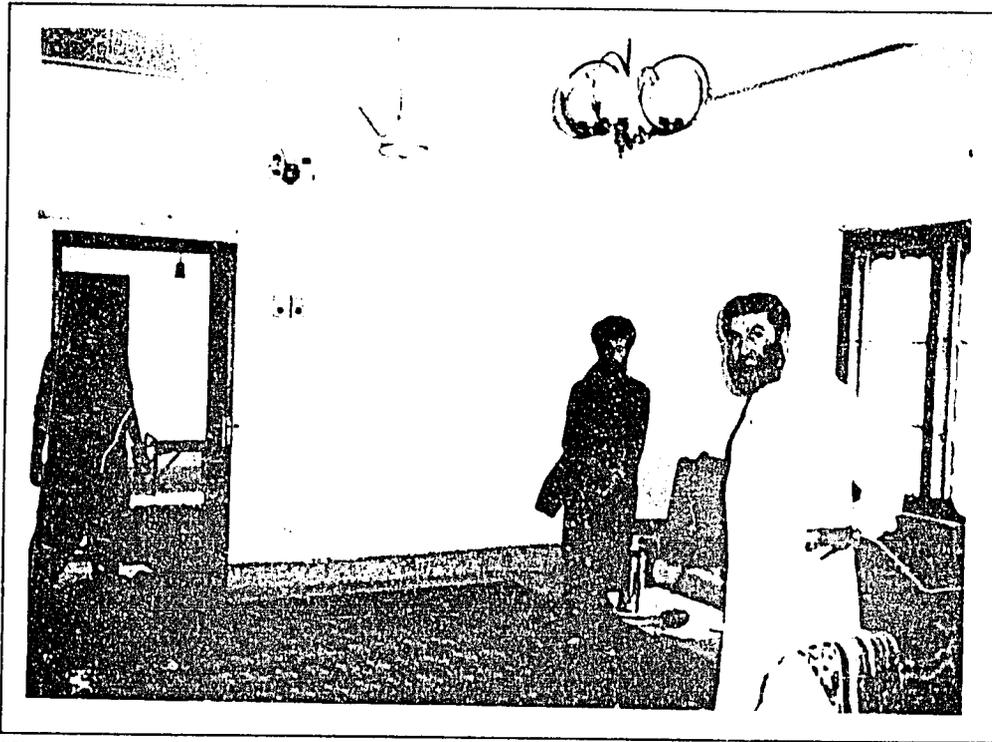


Figure 11 Quetta MSH Office Facility. Proposed location for BSAA equipment.

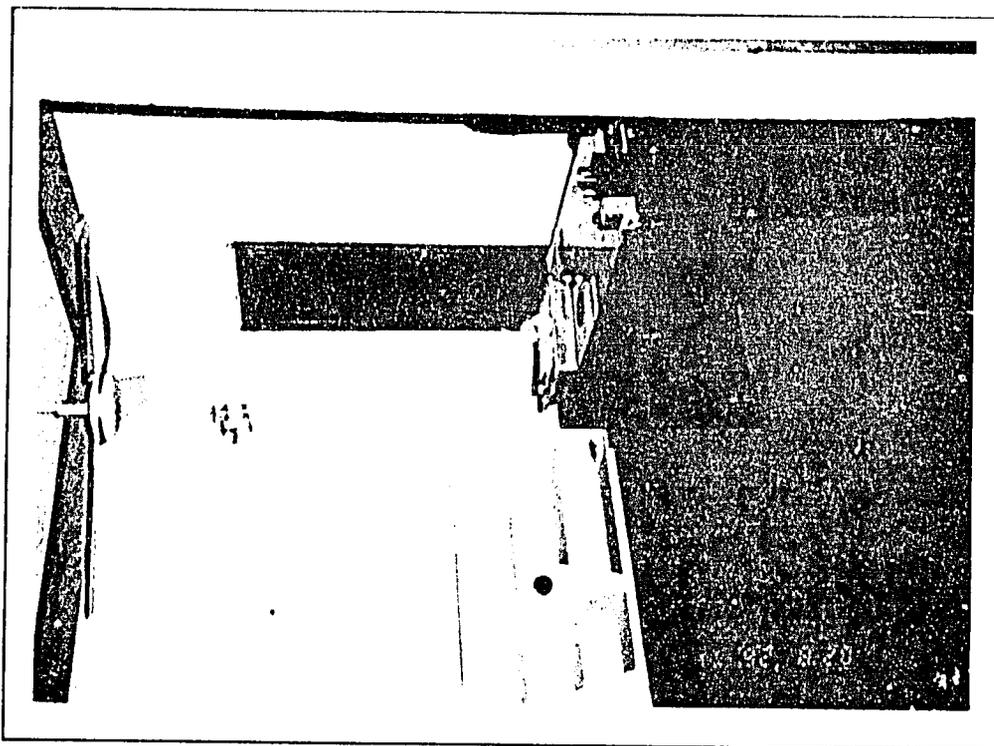


Figure 12 Quetta MSH Office Facility. Support office.

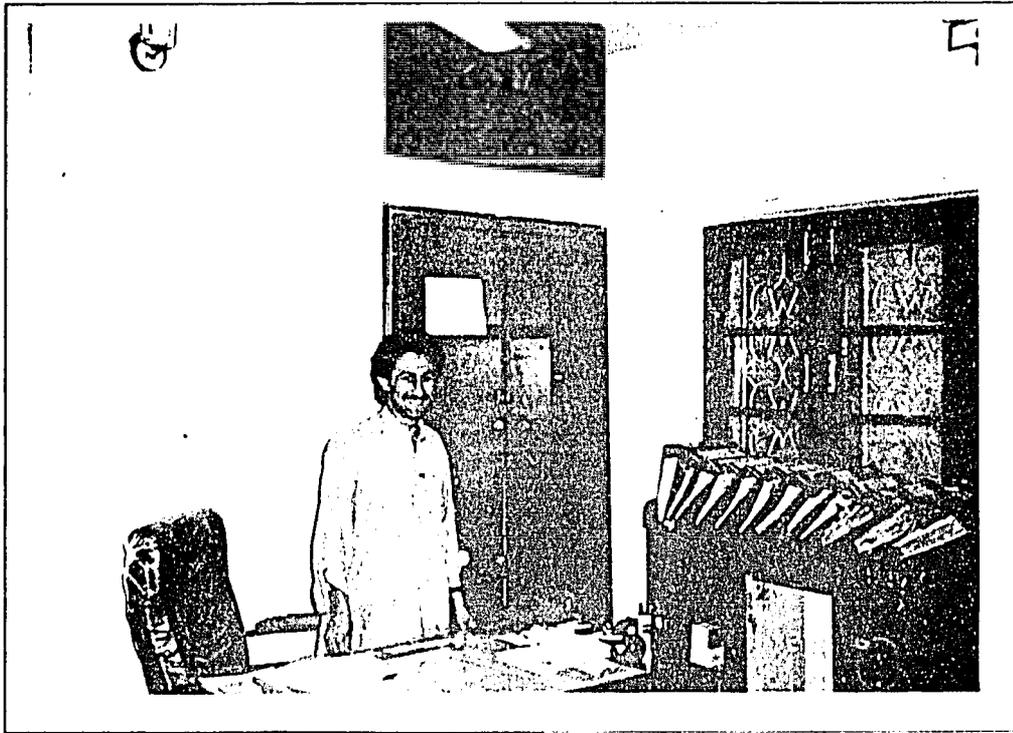


Figure 13 Quetta MSH Office Facility. Support office.

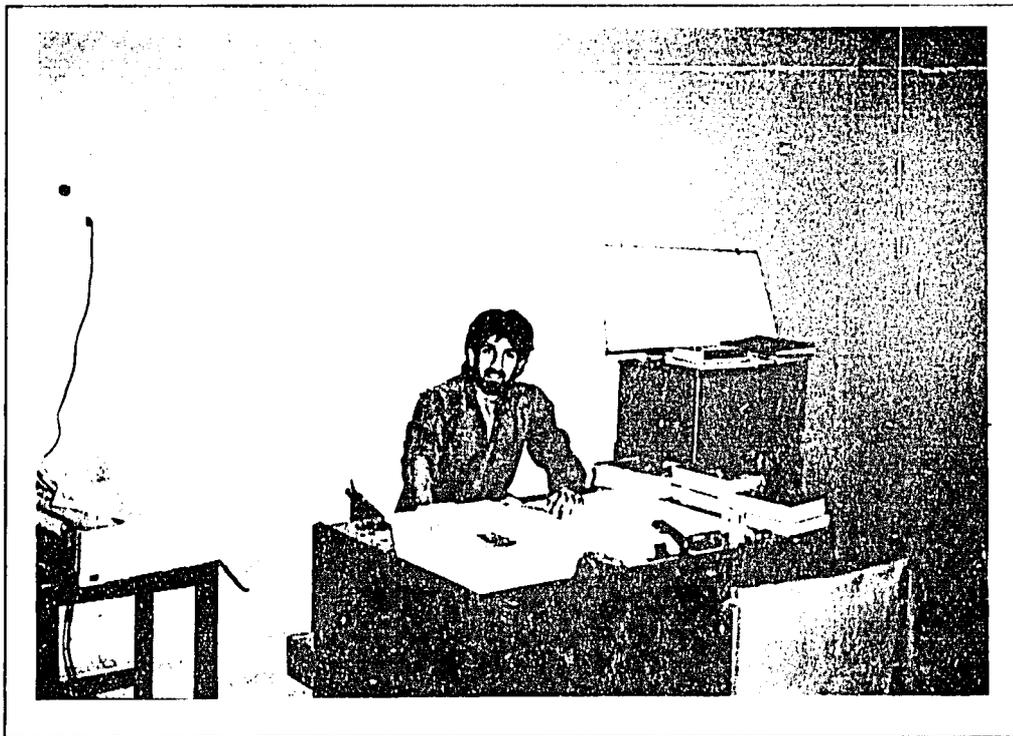


Figure 14 Quetta MSH Office Facility. Support office.

Site Photographs

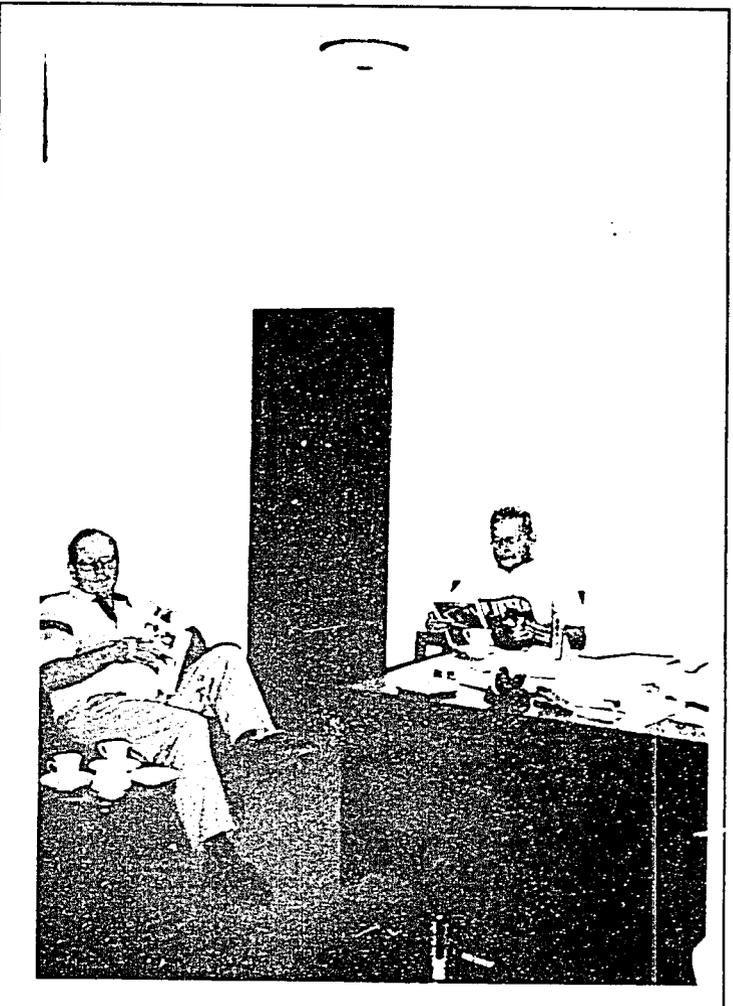


Figure 1 Quetta AID/REP Office Facility. AID/Rep's office. Phone on right side of desk.

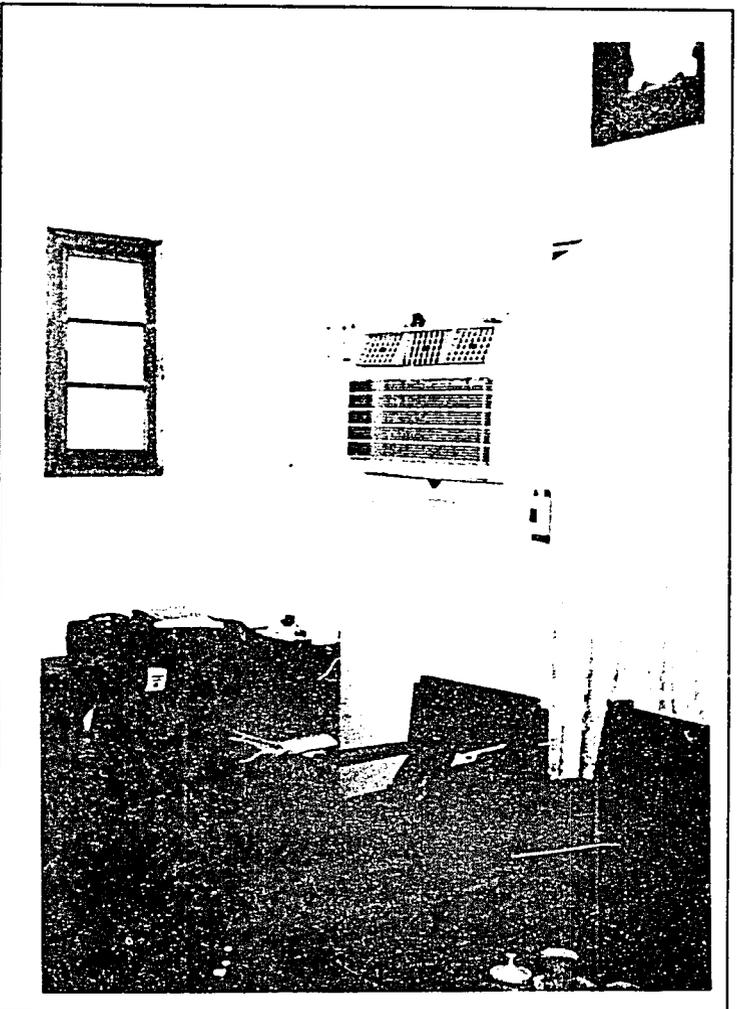


Figure 2 Quetta AID/REP Office Facility. View of northwest corner of AID/Rep's office.



Figure 3 Quetta AID/REP Office Facility. View of AID/Rep's office through door. Phone to be placed on desk.

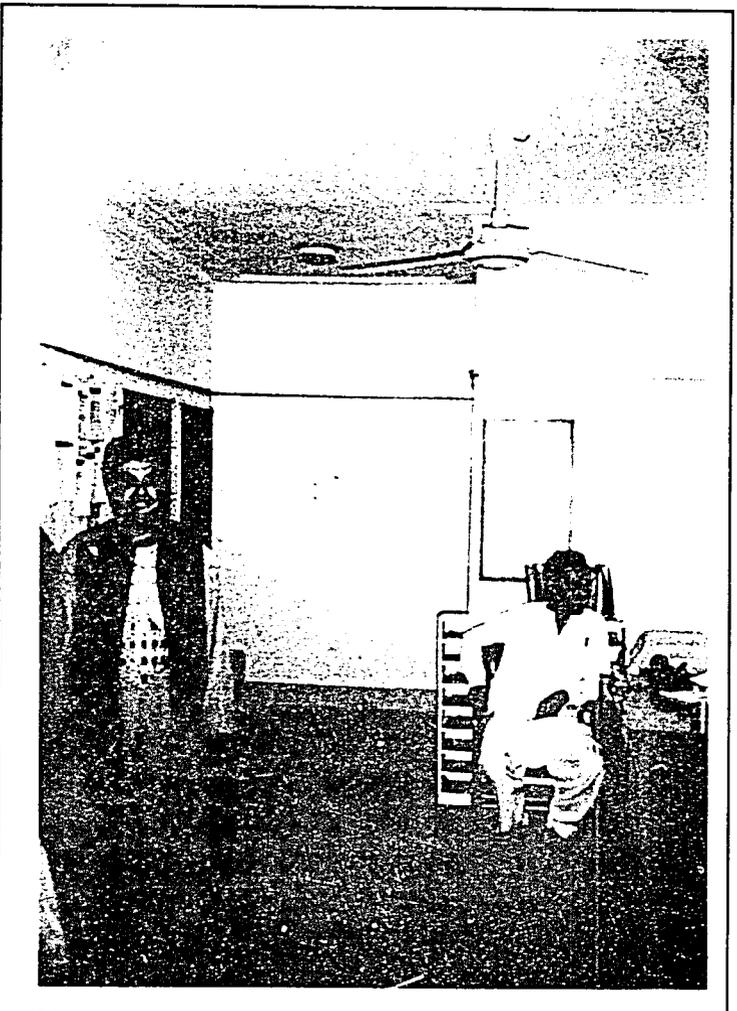


Figure 4 Quetta AID/REP Office Facility. Hallway outside AID/Rep's office. Cable to follow existing conduit path on left side of hallway.

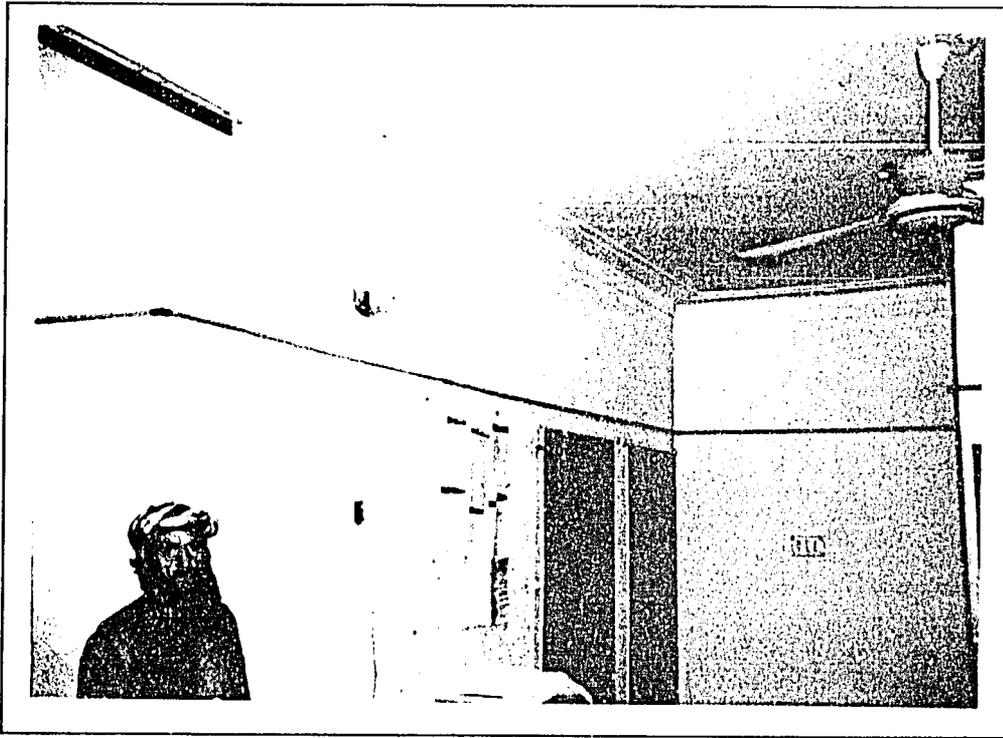


Figure 5 Quetta AID/REP Office Facility. Cable to be routed along existing conduit through curved archway.

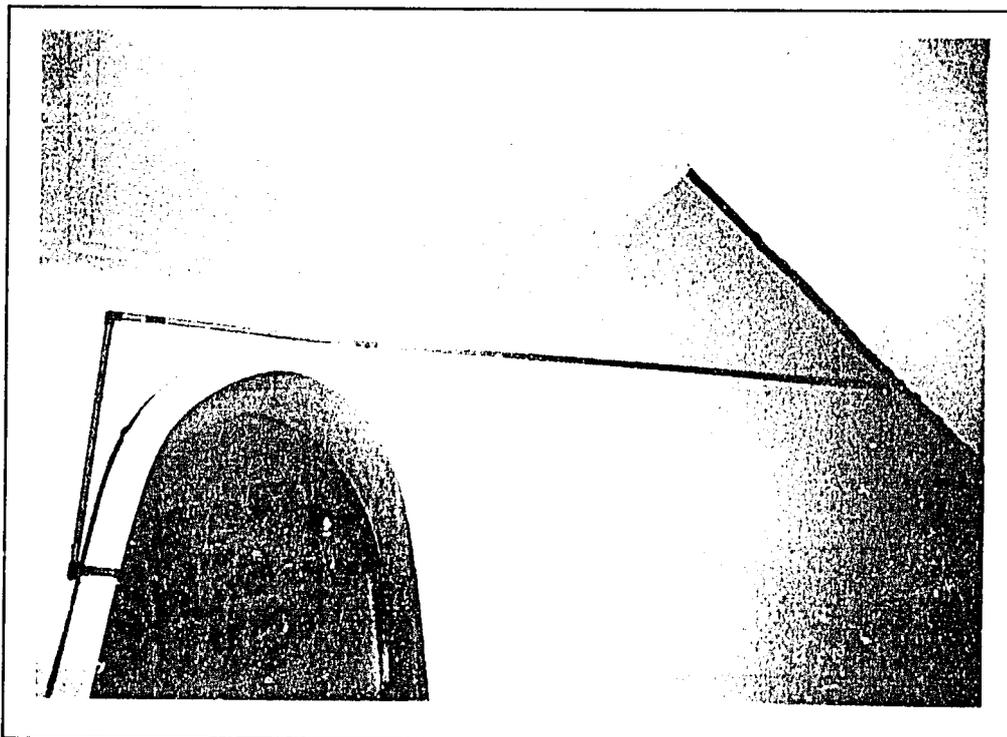


Figure 6 Quetta AID/REP Office Facility. Hallway to second floor. Cable to be routed with conduit.

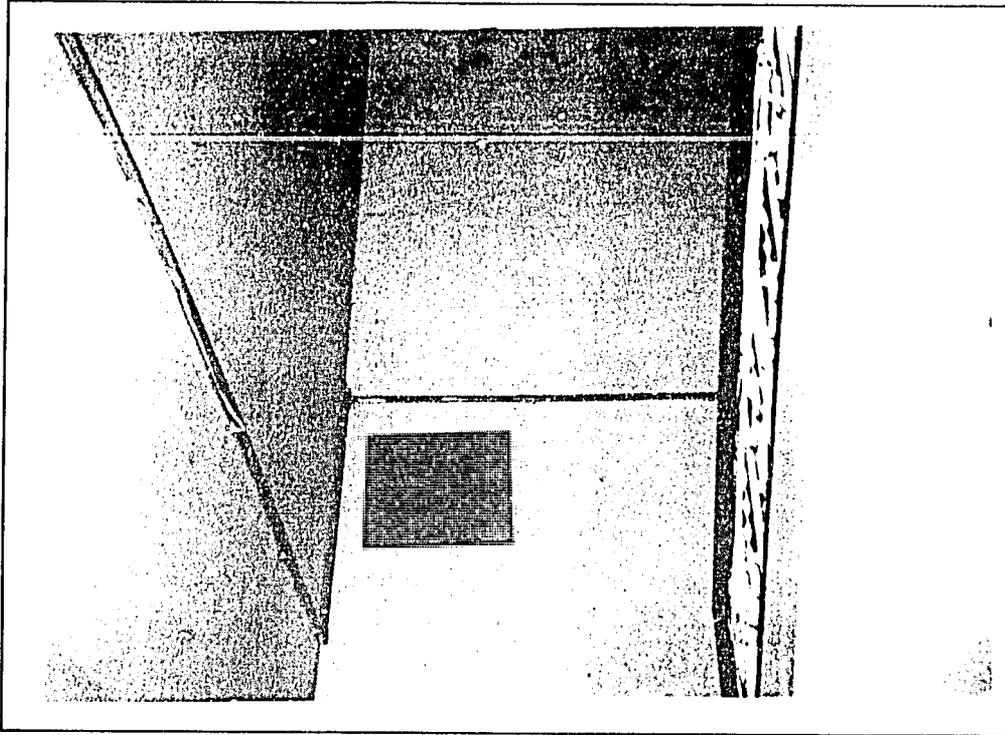


Figure 7 Quetta AID/REP Office Facility. Run cable along conduit to junction point just above picture.

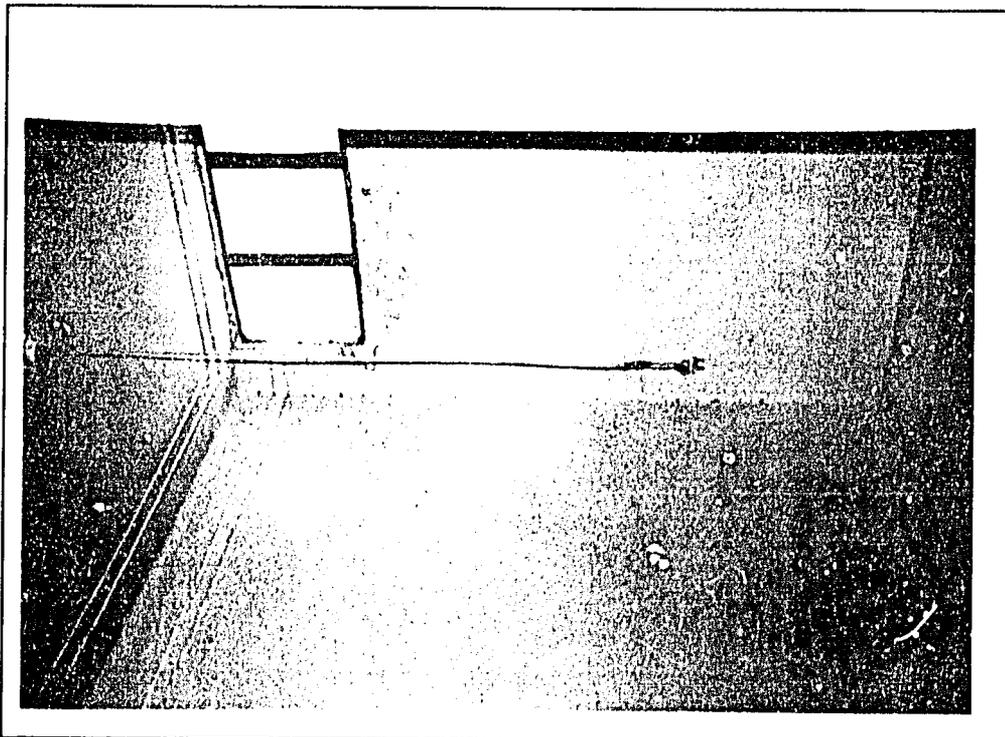


Figure 8 Quetta AID/REP Office Facility. Upper view of stairwell. Cable to enter into left wall at junction point.

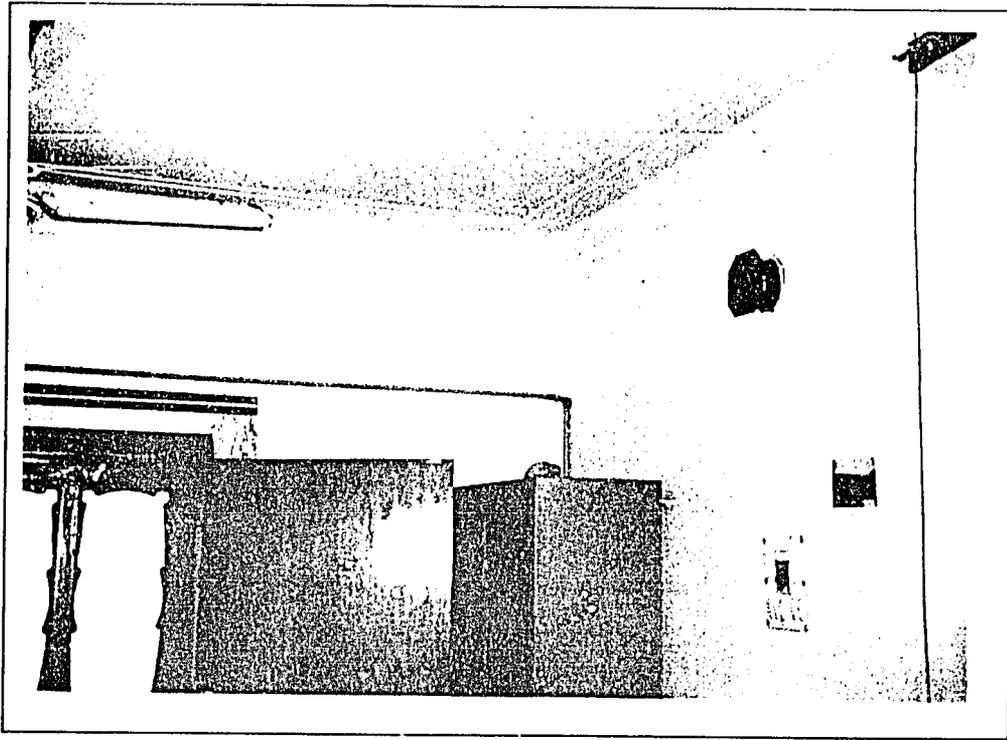


Figure 9 Quetta AID/REP Office Facility. Second floor, cable to be routed along conduit to VITA office.

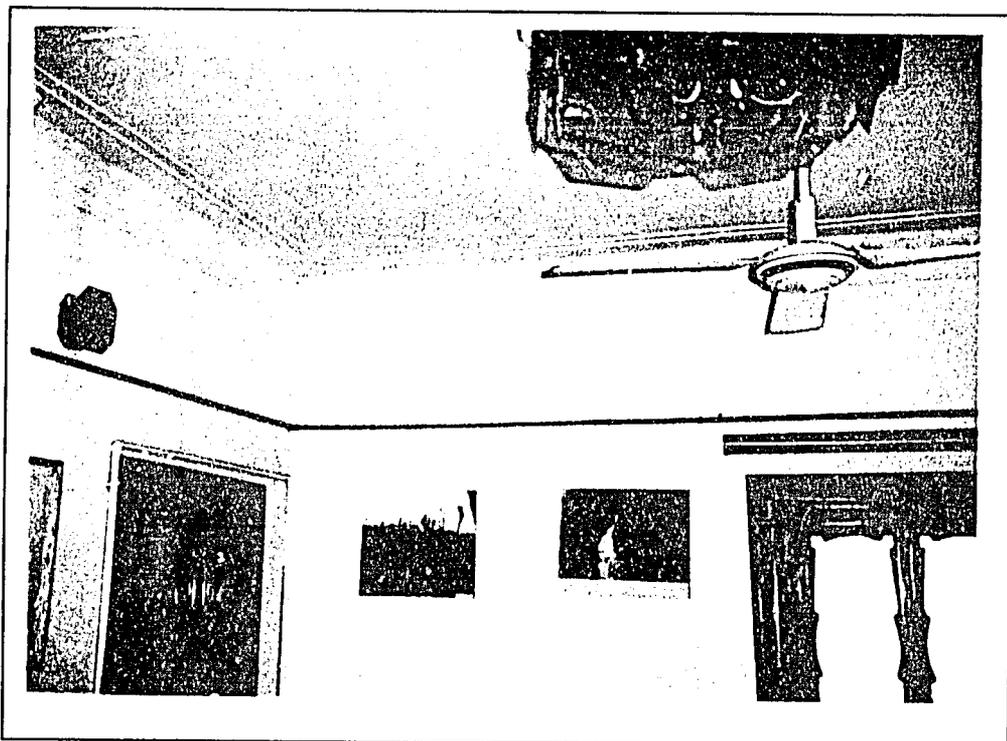


Figure 10 Quetta AID/REP Office Facility. VITA office door on left. Run cable along conduit, in through door frame.

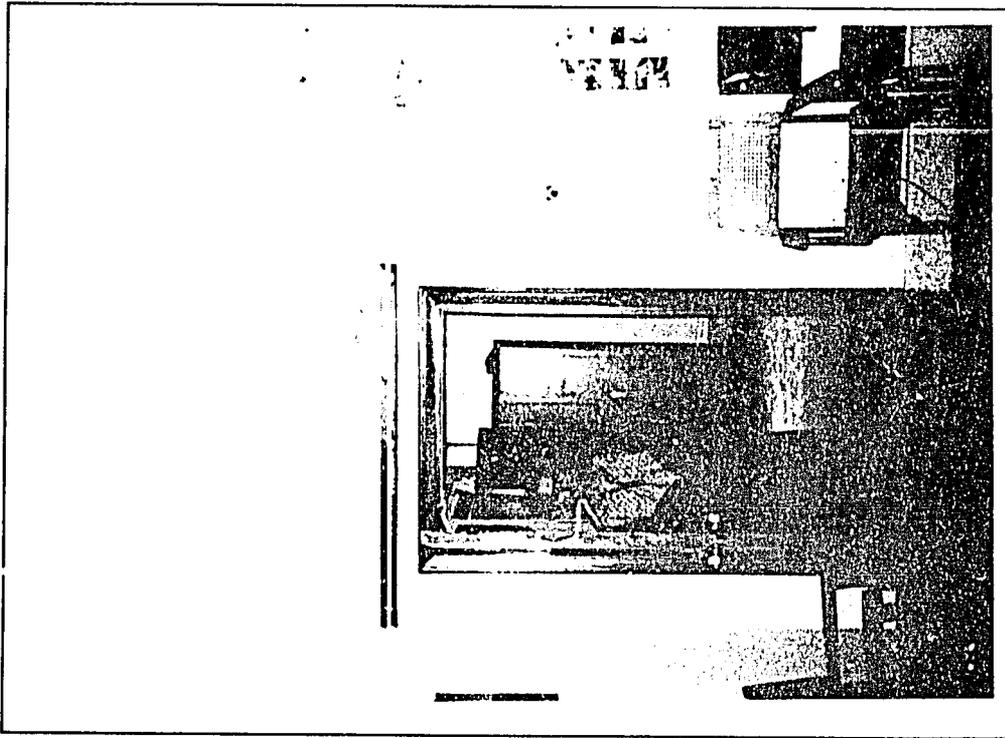


Figure 11 Quetta AID/REP Office Facility. View of entrance to VITA office.

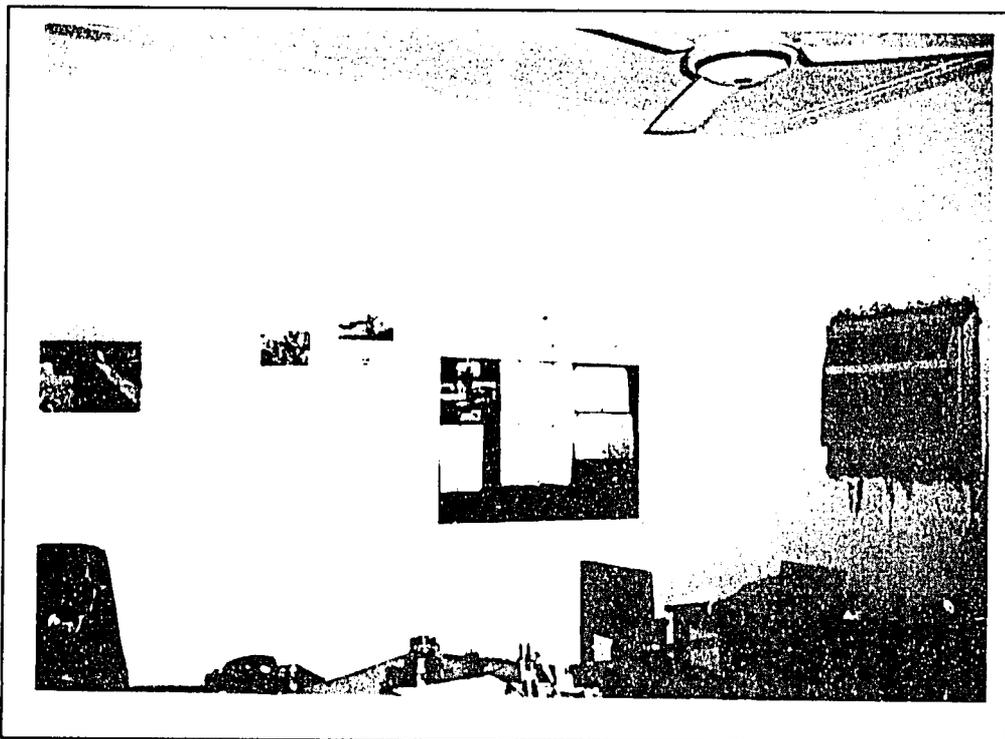


Figure 12 Quetta AID/REP Office Facility. VITA Director's office and desk. Locate phone on small table behind desk.

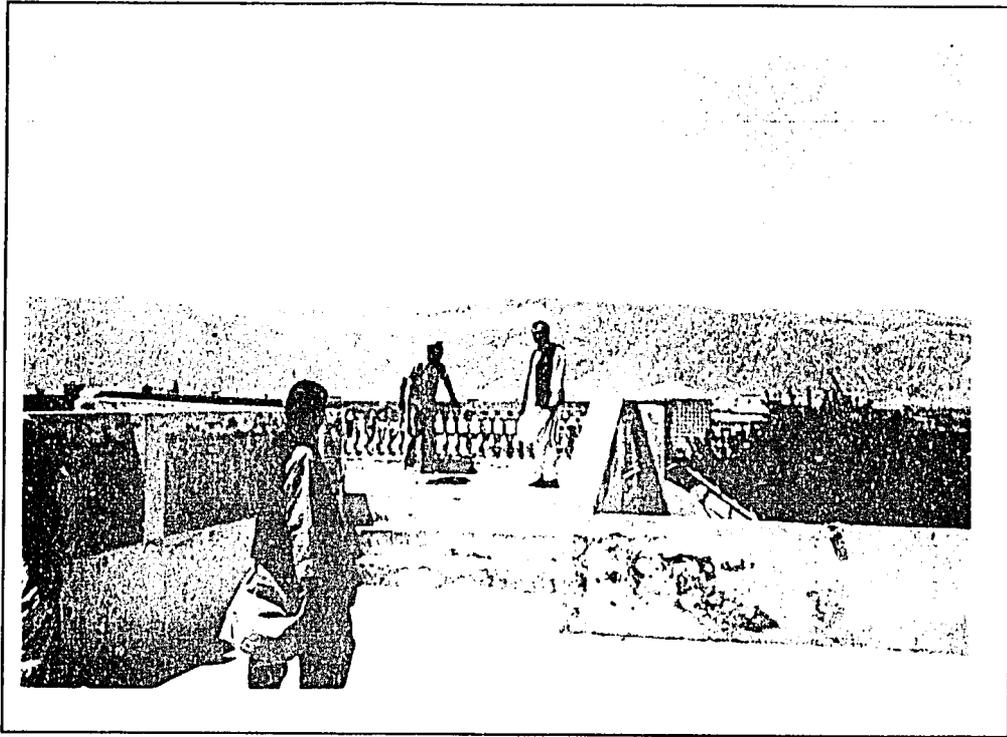


Figure 13 Quetta AID/REP Office Facility. Front section of roof facing West.

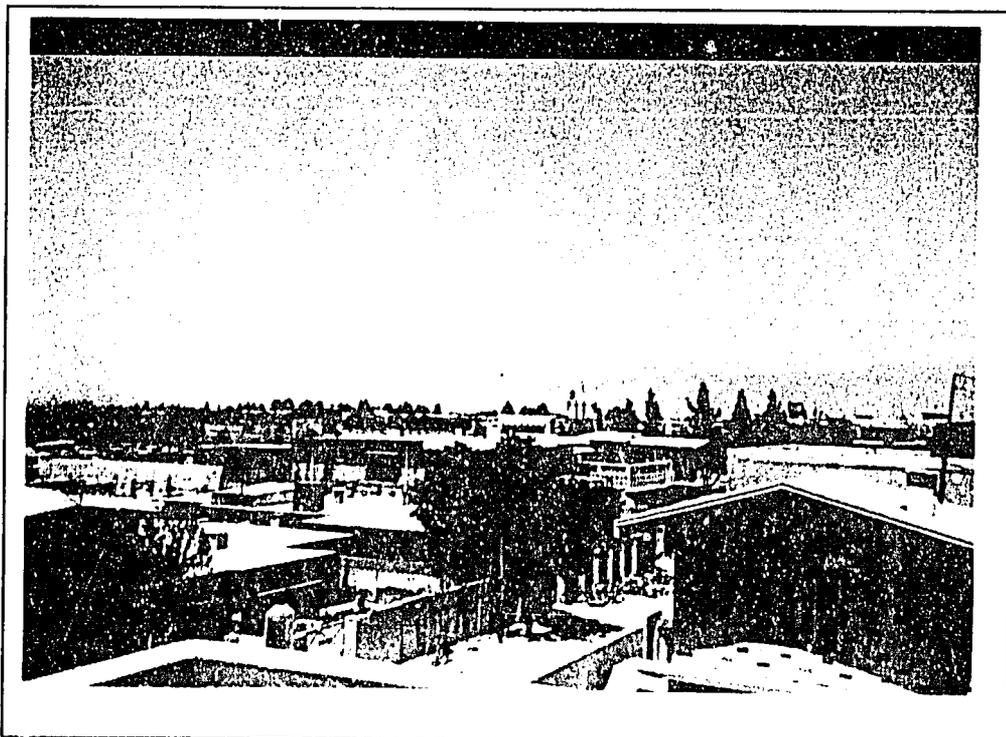


Figure 14 Quetta AID/REP Office Facility. View facing proposed IIIF Base Station.

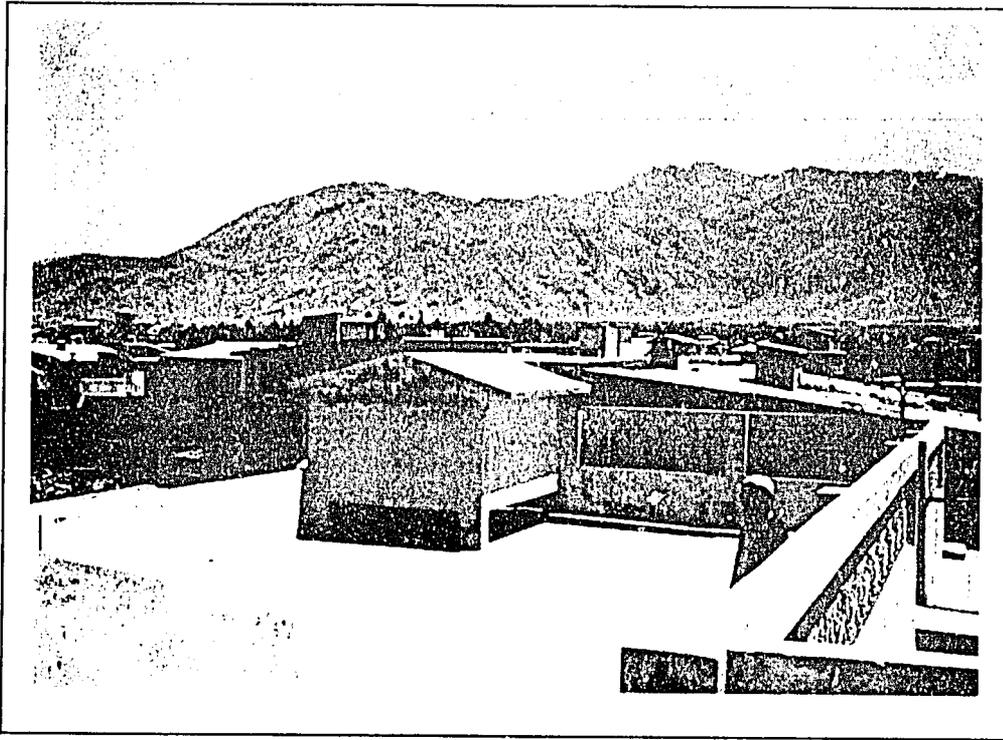


Figure 15 Quetta AID/REP Office Facility. View from roof facing East.

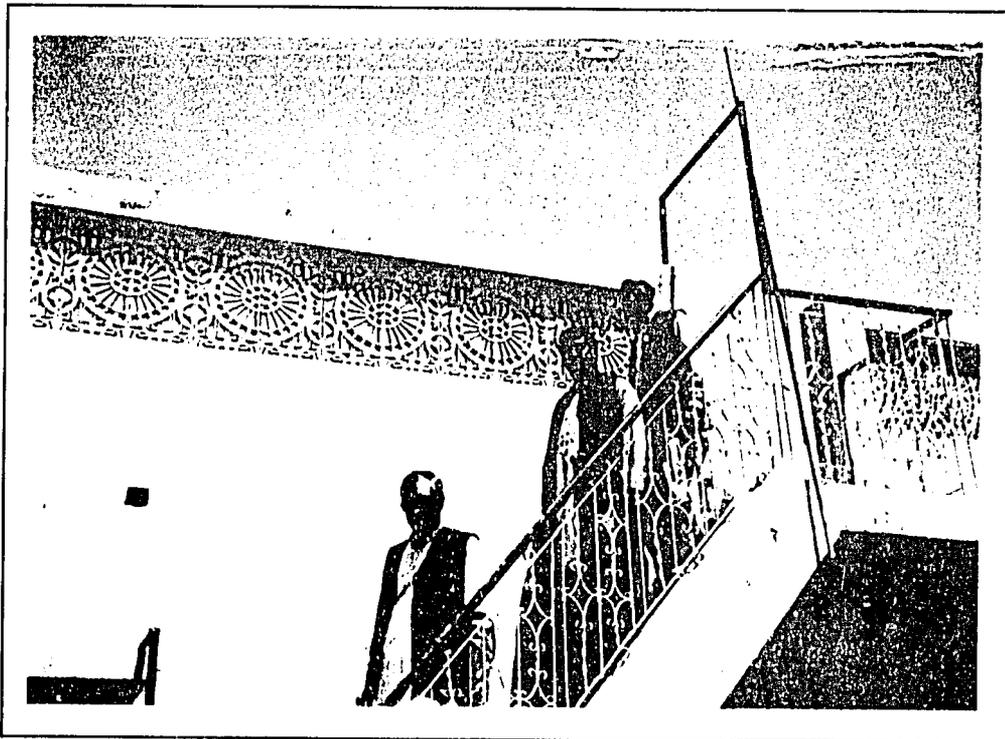


Figure 16 Quetta AID/REP Office Facility. Stairway to roof.

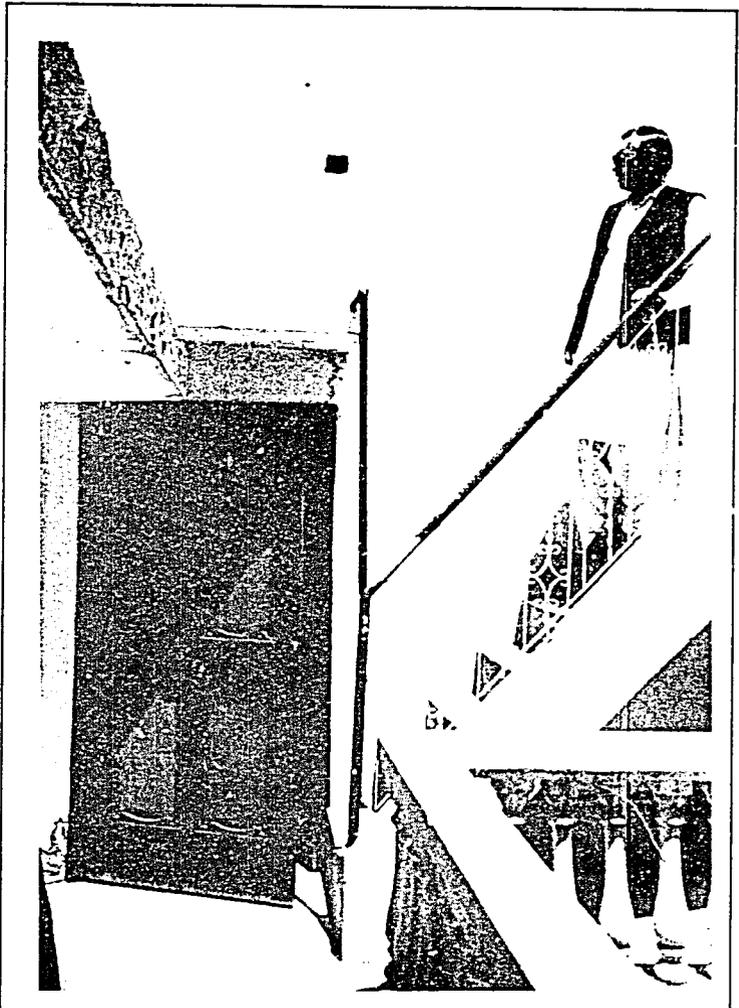


Figure 17 Quetta AID/REP Office Facility. Doorway to roof. Coaxial cable to be run through frame or wall to roof.