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diagram*

HIGH LEVEL ADVISORY ASSISTANCE TO
FEDERAL INSTITUTE OF INDUSTRIAL RESEARCH
OSHODI, LAGOS

SI/NIR/93/801
FEDERAL REPUBLIC OF NIGERIA

Technical report: Second mission in computer maintenance and repair *

**Prepared for the Government of Nigeria
by the United Nations Industrial Development Organization,**
acting as executing agency for the United Nations Development Programme

**Based on the work of Günter Fischler,
Consultant in Computer Maintenance
and Repair**

Backstopping officer: Shadia Y. BAKHAIT
Industrial Information Section

**United Nations Industrial Development Organization
Vienna**

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* This document has not been edited

Explanatory Notes

Value of the local currency "NAIRA"

     1 US $ = 23 NAIRA (November-December 1994)

Abbreviations

AVS	Automatic Voltage System
CPU	Central Processing Unit
CTA	Chief Technical Adviser
DOS	Operating System
DTP	Desktop publishing
FD	Floppy Disk
FIIRO	Federal Institute of Inndustrial Research Oshodi
HD	Hard Disk
I/O	Input/Output
kB	Kilobyte
LCD	Liquid Crystal Display
MB	Megabyte
MS	MicroSoft
PC	Personal Computer7
RAM	Random Access Memory
UNDP	United Nations Development Programme
UNIDO	United Nations Industrial Development Organization
UPS	Uninterruptable Power Supply
WFW	Windows for Workgroups

ABSTRACT

Fischler Günter, Consultant in Computer Maintenance and Repair

Project title :   High Level Advisory Mission to Federal Institute of Industrial
Research Oshodi, Lagos

Project number : SI/NIR/93/801

This report presents results of the first mission undertaken by the Consultant over the period 15/11 - 15/12 1994, to the Federal Institute of Industrial Research Oshodi (FIIRO). in Lagos.

The main task of the mission were :

Installation and commencement of networkoperation, organisation of inhousetraining, providing of different supplements and introduction into networkadministration. Repairing of destroid parts.

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Introduction

The consultant was attached to the Federal Institute of Industrial Research Oshodi (FIIRO).in Lagos-Nigeria. The mission lasted from November 15 through December 15 1994.

The main tasks of the mission were:

a: Installation and commencement of operation of an WFW 3.11 peer to peer network with an Ethernet cabeling system
b: Control of delivert parts and control of their function
c: Additional parts :
   Ethernet Repeater and supplementary cable were necessary (chance of residence)
d: Organisation of local training
e: Introduction into administration and function of WFW networking
f: Providing of duty list for not delivered parts, controlling by the FIIRO technician and Mr Merison (UNDP/LAGOS)

CONCLUSIONS AND RECOMMENDATIONS

The delivered parts do not coincide 100% with the demonded specification - the PC´s e.g. differ in clock frequency, BIOS and case outline (Desctop and Tower models). But they correspond even surpass the minimal requirements I recommended. Also the exchange of single cards is guaranted (one of the PC´s has been ordered as a spare parts store). Under this circumstances I recommended and executed the following installation respectively distribution of PC:
The most powerful PC will be used for DTP employment. The low performance PC will be used as a "SERVER" (file and printserver) and can serve as a common supplement working station. The SERVER has been equiped with the backup-system. The third and the fourth PC (from the new 486 based systems) will be used in the

library (including Scanner and CD-ROM) and by Ms Dungor for DB-programation and text-editing.

Due to the SERVER (spare part PC), wich normaly does not exist in a peer to peer network and whos tasks have to be distributed on one or more PC's, we get the possibility to dispurse some processes on this SERVER (backup, printing, scanning). This also allows to store files on an central and accessable place. One of the big advantages for example is that the library dates are always accessable and not only when the library PC is turned on. This certenly provides that mencioned SERVER is always the first and the last active PC within the network. It means that it is not necassary that all PC are turned on to have access to the entire information store (and also for printing and backup processes).

For an efficient backup handling every PC got a DATA directory, where the networkdata-files have to be stored. This local directory should in a second step be copied to the SERVER, to guarantee the SERVER's main function as a general information store. A daily full backup would be too expensive and could not take place automaticly (the tapes should be changed - per tape 250 MB).In the other hand there is no point to backup static files constantly. The backup strategy should be as follows : from monday to thuersday a daily backup of the new respectively changed files (incremental backup) and every friday a full backup. The meaning of a full backup in this context is backup of the DATA directory. There should be prepared two tapes for the daily backup. Each tape contens the backupsets of one week -week 1 : tape A, week 2 : tape B, week 3 : tape A ......The weekly backup should respect the same strategy. I recommend to store two examples of the weekly backup at least two weeks. The weekly backup demands probably more than one tape - depending on the amount of dates. Periodicly they should execute by an technician a real full backup (complete drive(s)) of every PC.

The SERVER does not only include the backup system, but also a connected Laser-printer, which can be used from every PC.

Due to the removal of the computer centre, the distance was to large to the planed network. The supplementary demanded Repeaters allow a bridge over the new distance. The situation of Repeaters and the laying of cable have been discussed with mit Ms Dungor, the FIIRO technician and the representitive of MBM Computers :

Repeater A - technician room

Repeater B - library

I refered to enclosed grafic.

The saving of both Repeaters with at least an AVS is necessary. A pylon upholds the cable layed within the buildings. The cable should not be a sunmary of peaces, but a

single peace to avoid mechanical and enviromental influences. (MBM Computer has already got the order.) Using the intermediate building as a pylon is diadvantages for crossing electricity cables.

Due to delivery problems I did´nt get the entire list of the demanded spare parts until my departure. So I could not repair some of the devices. Revering to a discussion with FIIRO technician Mr Lampejo this should´nt cause a problem. The missing parts are mainly Batteries for the UPS, LCD-Oscilloscope, Repeater, additional Ethernet cable as well as Floppydisc and Harddisc for the Laptops

The new local situation offers a advantage possibility. The very instable Voltage situation demands to use different intermidiate units (AVS, UPS). The electrical installation can be based on two completely seperated 220V curcuits. One curcuit will be used for light, aircondition.... and the second curcuit for the PC´s and their peripheral devices. Following advantages :
Reduction of impairment coused by the use of other other electrical machines e.g., efficient using for intermediate units for more PC´s (per unit) without application of additional junction boxes. Considering a later installation of a extern generator (this would avoid power failures and intermediate units would´nt be necessary), the connection does´nt cause any problem, because the PC curcuit does already exist. Otherwise either the cable system must be redone, or the generator must be more powerful to procure supplement power (light, aircondition....)

I. ACTIVITIES

- Contolling of delivered parts with FIIRO technician Mr Lampejo
- Installation of Ethernet cards and providing of Ethernet cables with the delivered tools. Installation of MS-DOS 6.21 and WFW 3.11 with Mr Lampejo
- Providing of a fault list
- Providing of a self installing DOS disc with Mr Lampejo
- Elaboration of backup strategy
- Planing of cable location
- Introduction of WFW and administration of WFW network
- Providing and transmission of a list for not delivered parts

II. OUTPUT

- Hard and Software installation of a WFW 3.11 network system including the cabeling system
- Installation of DTP (Aldus PM) for WFW

Annex 1. Persons Contacted

FIIRO

R. O. SODIPE   Assistant Director

UNDP

Floris L. MERISON   Programme Officer

Computer Vendor

MODERN BUSINESS MACHINES LTD
Victoria Island LAGOS/NIGERIA

Annex 2. Training Programme

It is recommended to handle the training programme for computer annd DTP specialists partly in common and partly divided. Some of the basic problems are of essential interest for both of them.

1th Part - Common for both specialists :
    General information about Network topologies & Systems
    (special ETHERNET IPX/NETX),
    basic information about Computer parts such as Displays, scanners, printers,
    controllers, memory and so on,
    installing operating system (DOS 6.x),
    memory drivers (HIMEM, EMM386), HD caching, "DOUBLESPACE",
    Installing "Windows for Workgroups" (network)
    Introduction in the networksystem (access rights,device sharing ....)

2nd Part - DTP specialist :
    "ALDUS PAGEMAKER" for Windows (last Version)

2nd Part - Computer specialist :
    reading original circuit diagrams
    setup procedure at 486 systems
    hardware development of add-on cards
    I/O - devices
    video cards : systems, programming, character-sets,
    memory occupation under DOS
    HD, FD : types, controllers...
    POWER SUPPLIES
    wave shape and timing measurement (Oscilloscope)
    ETHERNET IPX/NETX system : characteristics, cabling systems ...
    DRIVERS : network, windows; installing, possible problems, conflicts ...

Proposed duration of training : 3-4 weeks (2-3 weeks for the 2nd Part)

Proposed country of training : Austria (Vienna)

Language : English

Annex 3. Spare parts and tools needed to upgrade computer units

- 4 x PC 486/33 DX Desctop or Minitower case with one free 5¼" bay
    - 8 MB RAM
    - 300 MB Harddisk
    - 3½" (1,44 MB) FD
    - VGA 1024x768
    - MOUSE (serial prefered)
    - VGA Color Monitor 1024x768 14" or 15"
    - Keyboard (engl)
- 2 x Internal 250 MB Backup Tape 5¼", QIC 80
- 20 x Tape Cartridge 250MB QIC 80
- 3 x HP 4/L Laserprinter
- 2 x Hand-Scanner (Software included)

- 10 x PC AT/XT Ethernet Card (8 Bit, Novell 3.x compatible, RJ45)
- 10 x T-Adaptor (male/2x female) - Ethernet
- 10 x Wall unit (crimp version) - 2x RG58 50 Ohm - wall side mounted
- 4 x Termination plug 50 Ohm
- 40 x BNC plug. crimpversion for cable (50 Ohm)
- 1 x 300m Thin Ethernet-coax cable Impedance 50 Ohm
- 1 x Cable Stripper for coax with different diameters & Substitute cutter
- 1 x Hand Crimping tool for BNC connectors (RG58)

- 1 x Multimeter with integrated LCD-Oscilloscope, 20 or 50 MHz
    (e.g Philips - PM95 Scopemeter & RS 232 Interface & Probes(IC Adaptor))
- 2 x Vacuum Cleaner (for Computers)
- 10 x spare bags for Vacuum Cleaner
- 2 x Vice for soldering works
- 2 x Drilling Machine
- 4 x Drill-set for iron (1mm - 10mm)

10 x   Printheads Type EPSON LQ850/LQ1050 (24 nails)
2   x   HD for TOSHIBA LAPTOP T1200
            Modell : PA70448E   (HD Type : JD3824RROT1)
2   x   FD for TOSHIBA LAPTOP T1200   (3½" 720kB)
2   x   Drum unit for HP4/L
2   x   Collector unit for HP4/L
10 x   Toner for HP4/L
6   x   Sets of UPS-Batteries :   TOPAZ POWERSONIC PS/2280 QTY2
            type Lead acid, maintenance free, 24V nominal (12V each).

1   x   Microsoft DOS 6.2 (engl)
1   x   Windows for Workgroups 3.11 (engl)
1   x   ALDUS PAGEMAKER for Windows (engl) - last version
1   x   DBASE iV (engl)
1   x   Norton Commander IV (engl)
1   x   Norton Utilities VI (or later version) (engl)
1   x   PC-Commute ("PC Tools Ver 7.0") (engl)

Annex 4. Terms of Reference

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

U N I D O

FEDERAL REPUBLIC OF NIGERIA

JOB DESCRIPTION

Post title :   Consultant in Computer Maintenance and Repair

Duration :   1.5 m/m (in two missions: 0.3 m/m and 1.2 m/m)

Date required :   As soon as possible

Duty station :   Lagos/Nigeria

Purpose of project :   High-level advisory assistance to FIIRO in maintenance and repair of microcomputers and peripheral equipment, particulary on the component level, on "chip level" and in DTP.

Duties :   The consultant will be attached to the Industrial Information Centre of FIIRO. His work will be co-ordinated by the Head of the Centre. The consultant will be expected:

1. To specify the equipment required for testing, repairing and training purposes.
2. To organize on-the-job training in maintenance and repair of microcomputers and peripherals, and in DTP.

The training will cover the following topics :

- reading original circuit diagrams/IC;
- neat sets (special setups)
- hardware development of add-on cards PC/AT (design)
- wave shape and timing measurement
- power supply
- hardware programming from add-on cards (VGA, EGA ...)

-    hard disc controllers/floppy disc controllers
-    character set programming.

The expert will also be expected to prepare a final report, setting out the findings of his mission and his recommendations to the FIIRO on further action which might be taken.

Qualifications: University degree or its equivalent in electrical engineering, with considerable experience in maintenance and repairs of microcomputers.

Language: English

Background Information

Under the project DP/NIR/83/021 UNIDO has provided to the Federal Institute of Industrial Research (FIIRO) technical assistance. A considerable part of this assistance consisted of computer hardware and software. To enable the FIIRO to build up a self-reliance in maintaining and repairing the computer hardware, the training of three FIIRO technicans by a computer company in Austria was financed from the project. After this training it became apparent that an additional training of 2 - 3 Weeks on a "chip level" would be required (6-8 hours daily).

GRAFIC FOR CABLE DISPOSITION

New Rooms

Repeater

~ *180 m*
Ethernet
Cable

LAB

Pylon

Repeater

LIBRARY

Old Rooms
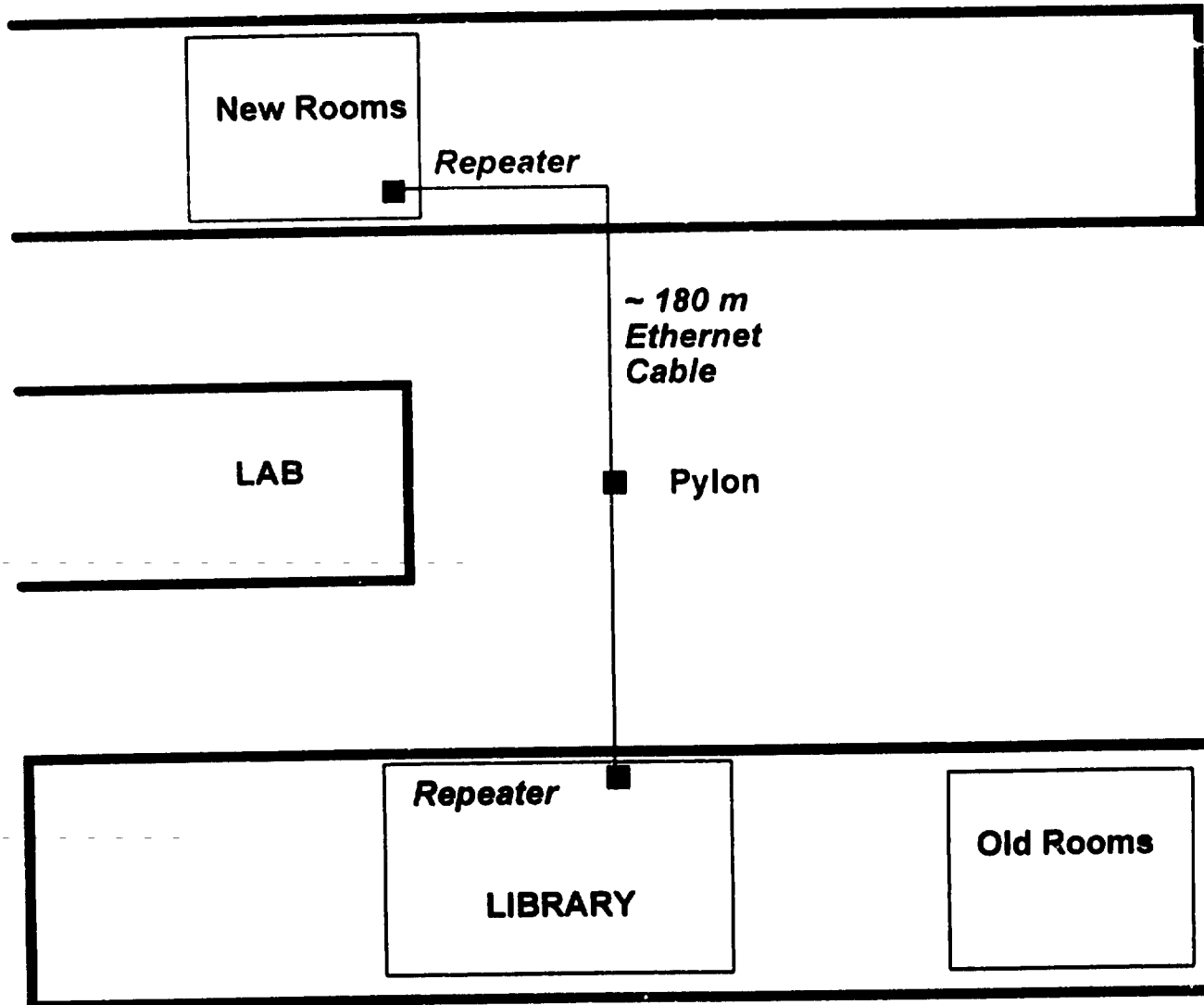
SITUATION OF PC´s IN THE NEW LOCATION