CITY TELEVISION HOUSE, KANO

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II

D E D I C A T I O N

Dedicated to all members of my humble family and to the cause of humanity.

DECLARATION OF AUTHENTICITY

I hereby declare that the work contained herein was done by me, and was a product of my research, surveys and documentations. That in the few places I have made references, quotations or the likes of an existing work, I have so-mentioned or have put such information in quotes or both. That I have made that much amount of information only as a case for debate, disagreement or consonance.

SIGNED
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ABSTRACT

One of the most important assets of man and humanity provided hy nature is the ability to communicate with frllou human beings. This is accomplished through several means. One of the most important of such means, and coming relatively late into the cadre is the television. The. television process was not introduced untill 1926, but today has proved to be a major in the vital field of communication-, Its distinction and remarkability are quite evident, and is comparable only to many of the technological wonders of the twentieth century.

Within less than sixty years of its invention, its world-wide usage and domination, over other methods of communication is evident. Today most family units, from those of the developed parts of Europe and America to the variously hybridizing ones of developing countries, can boast of the ownership of the tv box. Social place and importance vary from place to place and person to person, to arms an essential element to others

an impending necessity. What is therefore exactly is tha television? Where and how dn the pictures comes to the the homes of millions educating, informing and entertaining them7 How is the evident precision in tuning, co-ordinating and execution achieved in tenable and even pleasurable manner? What can anyone do to contribute to this worthy institution of man? What in particular can the members of our discipline (architecture) contribute in the development and general betterment of televisioo process?

As earlier said television is o recent development and achievement and did not come to Nigeria untill the last year of the 1950s. Yet today the country has over 30 statinns at its disposable, and the proliferation is continuing with remarkable rapidity. It is important for anyone to note that any study of one television station is in effect on general appraisal, since essentially a technical and functional similarity exist between all television stations. Our case will be based on a recently established station of the Kano State Government, the CTV.

Our work would be oriented towards achieving a precise and functional design with at least sufficient scholarly and professional background, usable by the Kano State Government.

It is expected tn serve as a forum for academic use by serving as a model piece both technically and functionally. The Issues of special requirements fnr television, particularly acoustics and lighting toether with air-conditioning provide us with a forum for an indepth and interesting study. A study of these will be made in such a manner that will benefit future students of architecture who by the nature of their projects have a special interest on this subject area.

Another objective of this work is the provision for flexibility necessary due to the dynamics in the fields of engineering and technology. This is to say that the design need not be changed with the Inevitable change in equipments and apparatus that occur every few years.

An understanding of the filming process, starting from picture shooting, recording, screening, editing, video-tape recording, etc. is absolutely essential since filminq is inseparable from television, which in-turn turns out to be a series of film on the screen. Film itself is different from other media, such as prints or records and that difference initiates problems in selection, evaluation, acquisition, cataloguing, storage, use and circulation. Procedures and space must be created for each of these functions. This would be treated along-side a general section on

television system. Rasic transmission pattern and requirements need be understood to ensure a thorough appraisal of the whole system and the proper design of the necessary spaces for it. It is also imperative to know what exact roles do the human elements, the talents play in television film production and the process of televiewing. How does the director translates a written script into a meaningful chain of pictures? What type of space and atmosphere is required for this? How much architecture is allowed for such space? What level of spatial restriction can the camera accommodate? How do the performers take to the stringent requirements of base light levels necessnry for camera operation in this region?

For the purposes of the all on-spot assessments, case studies will have to he thorough for identification of the problems and opportunities. Here the issues at stake is very important. What are the causes and solutions of studio acoustics and lighting problems? Are these problems not comprehcndable and surmountable at the initial planning stages. An iden-tification of the sources of common errors and mistakes of existing situations, with a view to avoiding them.

Important enough to be mentioned here is the problem of back-set and stage storage spaces ot o position of convinience from the studio. Must, the studios remain a jamming, place of draperies, scenery back-sets, props, furniture cameras, monitors, since this actually reduces levelofefficiencyoftheactivitiestakingplaceinthestudio.

The study of acoustics begins with a brief general study of sound behav/iour first at outdoors and later indoor. Sound general characteristics with respect to building materials along its path. What method provides the necessary sound attenntion level in the studio? The cost effectivcriess of initial notice control vis-a vis that of interior spaces. A determination and application of reverberation time control measures within the respective utility area in question. This begins with a gradual study of acoustical phenomenon:- reflection, reverberation, diffusion, absorption and diffraction. The application of acoustic absorbers and resonators io enhancing roor acoustics. The use of porous materials, acoustic plasters,.panel absorbers cavity resonators. Inprinting, draperies., space absorbers and certain suitable surface finishings, The applications and use of electro-acoustic aides in enhancing sound

quality and recording level. The positioning and selection of microphones and speakers with due consideration tn their make, mechanism ann fields of pick-up. The use of the echo-chamber towards achievement of same acoustical atmosphere, as in music studios, etc.

The lighting aspect is another issue of equal importance. Appropriate lighting is an important factor in achieving functional television station. The determination of the lighting level and character demand for each utility area. Placement of lighting fixtures with due consideration of other light-sensitive equipments in the room. A study of the principal characteristics of light, hard light, soft light and diffused light would be required. Also a brief enquiry into some camera lighting needs, methods of controls; dimmer; flood lights, etc. It is necessary to consider this alongside the jobs of the lighting supervisor and that of camera control unit, CCU.

The factor of lighting leads to the requirement of special concern fnr the aspect nf air-conditioning., The intensive lighting amount is transformed into heat energy in the studio, which left unchecked can make the studio inhabitable. The air-conditioning requirement is therefore intense.

This is further cnmplicated by the acoustical requirement that proscribes minimum or no noise lev/el at all in the studin during recording. Therefore thorough analysis and exploration will have to be made In search of the method that best performs at minimum noise level at especially the receiving end, A study of the various duct systems, lower positioning and adjustment and the placement of the outlet os a whole, which of the system can accommodate least bending and cornering of ducts that increases noise levels? What positioning is best for the generally noisy control air-cnoditioning plant? etc.

Of special mention in the objectives of the work is the creation nf the best type of atmosphere or staging for the purposes of drama production Why should a Fulani house that is usually made out of guinea-corn stalks be deficted in the studio with only an illusionary back-set painting as a teller of what the scone has to defict? It should be noted that that tv viewers are quick at out-witting any such superficial arrangement and the bye-effect to them can be fatol to their otherwise high esteem the television medium is placed. What can the designer of a drama stage for televiewing purposes do to rectify this kind of anomaly. Does it call for the staging of such plays elsewhere from the box of a room that is the studio?

How does one design a place that is to be used to deficit two extreme cultures, contrasting each other? It is the view of the author thnt a better avenue should be defined for purposes of drama plays for television; since the said is an important aspect in one of the three legs that the television medium is supoosed to extend to the public it serves, that of enteraninmet, the other two being information and education.

Not the least in mind in the objectives of the topic is the issue of siting nf o television station.

The issues that affect siting a situation, both the physical and the sociological ones, the first ones being technical. Wether the site is clean of any surrounding terrain capable of blocking the paths of transmissions. In this regard it shnuld be noted that television transmission is in f act affected by the presence of physical obstacles on its paths nf transmition. Its limitation to what is referred tn as the line-of sight-distance, which is approximately 50 miles should be considered. Another important planning that can well start from siting is the issue of acoustic control within the site. Therefore a conscious siting giving due regards to cost, acoustic interferences, possibilities of interfacing, opportunities for on-site location of transmitter facilities

nr lack of **it,** accessibility of the site to both **its** staff and members of the general public, talents, performers, etc, whose participation is a determinant in the success of the station. Also siting will affect area of coverage which will in-turn affect commercial patronage uhich the station is likely to enjoy from enterpreneuers.

Last but not the least is the consideration for architectural form of the television station, A form that most reflect the charnctor of the environment, the activities anri accomplishments of the television station and also its abstraction. Whether the television can accomodate enough freedom necessary for the achievement of sound, definitive nnd interesting architectural form.

CHAPTER - 1

GENERAL INTRODUCTION:

One of the most important assets of man and humanity provided by nature is the ability to communicate with fellow human beings. This is accomplished through several means. First by sign language as of the stone-age man, by speech and by writing in that order. Of late even these have proved inadequate in keeping with the pace of time and level of development. The need for speed in the dissipation of information coupled with phenomenal developments in technology have led to the invention and usage of electronics equipments and facilities for the sole purpose of communication. This include the radio, telex, telephone and the television. The latest in that line, and by far the most remarkable, is the television. Today the televiewing process has proved a major force in its noble rolesof information, education and entertainment. By this provision the Nigerian is enabled, by the mere tuning of a nob to sit back and watch the American president making a speech from the white House in faraway Washinton. He is also shown the journey of his fellow human beings to the moon, all these from a small corner at his house.

He is entertained by his fan artists and watch the performances of his star talents from the edge of his bed. He is provided with a forum for discussion, debate, laughter or in effect a "non-living-life-partner" in form of a box commonly referred to as the television.

This box that is referred to as the television has come to be regarded as just another element among the numerous items that are to be found in each home and are presumed necessary to make the home what it is. In fact the lives of many a people in many a household has come to be intricately tied to their television set, deferming their stay or absence in the house, their times of going to bed, times of relaxation, etc. It's therefore more than enough a forum for study and concern by any interest group the architect not exempted. Little a number of people, however, have taken interest to know what happens beyond the surface of the screen, let alone enquire about the whole transmission process.

Television has been defined as the science of transmitting rapidly changing pictures from one place to another although it varies considerably in forms and nature of both transmission and reception, there's a basic similarity between all the forms and systems.

Thereis no doubt also that one of the most remarkable aspects of it is its imediacy. The invention of television broadcasting by John Baird in 1926 has provided the opportunities for viewers to watch performances of groups, news, shows, documentaries, life features, etc on the screen in their houses as the events are happening.

Another distinct issue about the television as a form of media is the provision of vision to the viewers' highest possible satisfaction. Man's unending curiosity and interest in knowing what happens in places other than his own is best served by the provision of the visual experience. The apparent objectivity of audio visual programs creates an impression of reality and authenticity not obtainable in other forms of mass communication.

Television, Origins and Philosophy:

Television has been conviniently described as the child of three parents in the mass communication industry. These are theatre, film and the radio. The interelation of these and how they gave birth to the television is shown in fig. 1.1. It's quite clear that all of the aspects of the three mentioned are incoporated into the televisinn. This is also true of the production techniques employed in the production of televisinn

programs. In this regard a special challenge goes to the planners and designers of television stations since the physical setting, among other things, determine the nature of activity and their efficiency or lack of it, that would take place in the television.

Theatre:

The feature of the theatre is drama and we think of the "stage" as an integral part of the theatre. The stage here might take any form and size depending upon the nature of performances that would take place there. The interconnection here is quite evident when we consider that dramatic shows are a key element among the everyday programs of most television stations. The dramatic shows might vary from small comedy programs that might be conviniently performed on a small fixed staging, requiring only perhaps only occassional changing of back-set designs, lighting, etc. to the elaborate ones as those that might have to defict a whole set of ways, means and values of a particular environment, place or culture.

Radio:

Radio and television are undoubtedly inseparable in both physical and abstract terms.

In fact television has been tagged by some as "bad audio with pictures", and radio can regarded as a sub-set of television. In fact the transmission systems of television employs the use of radio waves for the transmission of both sound and picture signals. Given the striking similarity in mode of function and technical requirements and execution, the physical settings of radio and television stations are expected to be similar. Whereas the aim of the radio station is the transmission of sound signals, that of the television encompasses in addition the transmission of picture signals. In this regard radio features should be expected in the physical set-ups of television stations.



Film:

In essence television to the viewers turns out to be a series of films on the screen. Whether as elaborately prepared war film or a religious feature show requiring the most modest of preparations, some common features abound. Such issues as the use of specialized lighting effects applied music, etc, for the achievement of the desired suspense, the build-up of the desired tempo, etc, are distinctly common. In this regard requirements of filming process, ways and means, such as particular demands of shooting, development, recording, storage, reviewing and of-course transmission must be created. Also the use of the camera in the shooting process, whether the video or the motion-picture camera, have certain requirements in common. Lighting requirements and behavioural characteristics of both talents and producers as well as programmers are strikingly similar.

Now that the relationship between the television to its parent media has been examined what needs to be looked into by the physical planner is the ability to integrate the above sub-groups conviniently and efficiently in the set-up of the television stations. The constrains of course are numerous, in both technical and other requirements but many are not insiqmountable.

It can be mentioned even at this stage that the theatre aspect of television is the one least considered by many a designer of television stations. This is understandable when regard is given to the fact that while the other two issues involved are mostly technical and an impeding necessity, the first is more-or-less abstract, and how well it is done would affect quality, but definitely not a determinant in the process. However, it is worth mentioning that a successful incorporation of the theatre aspect of television is an impending necessary consideration for anyone who considers the entertainment aspect of television important.

The obvious feelings of disenchantment and disillusion by television viewers as a result of even trivial faults and errors, which are fairly common in drama productions are undesirable to say the least, for the purpose of entertainment for which the drama shows are due, and for the whole tv process as a whole. One of the most important factors that gives the television its rightful place, that of apparent objectivity as a result of the visual experience, in both contents and style, happens to be easily erodeably in the eyes of the viewer. In effect, the top-notch position that the general public places the television among forms of mass communication is as much a liability as it is an asset.

The eye being the prime sensitive organ at the disposal of man is quick and slick at detecting the smallest of tricks or errors. Precision is therefore the watchword in television planning and programming. In this respects, the drama aspect should be seen as the most sensitive to such, as the whole episode usually hangs on a thin and translucent veil of illussionment. What is being said in essence is that a situation where the viewer perceives and understands that what is supposed to be a primitive Fulani settlement in a remote rural environment, for example, is in fact a small corner of a studio in the heart of the city of Kaduna is totally fatal to the viewers faith and enquinity on the whole television process. It is therefore necessary to as, much as possible, stick to the actual representation of places and events in their real form rather than resorting to film and certain graphic, many of which are detectable to the critical mind.

Television and Society:

The imqueness of the television as a form of mass communication has already been pointed out. This apart from the provision of both vision and sound, is the remarkable speed with which the public is reached.

The intention here is to point out what accomplishments the television is able to achieve in the society.

In general terms television entertains, educates and informs. The specific functions of any particular station would depend on the type and also purpose of setting of the station. This would be discussed later. Generally, however, the power of television over the society can be identified:

- Communal feeling shared by the television viewers of a particular station within a particular area of coverage serves to foster unity, can facilitate dialogue between, otherwise non-communicating groups.

- Political leadership use it as -- powerful organ of propaganda, to create the design opinion and beliefs, dispositions for or against a particular set of noms, groups, nations, etc.

- Television as a force of encouraging habit formation and the influence of conduct; the War against Indiscipline is a case example.

Special educational goals and purposes achieved by television as in educational stations would be discussed later. The visual experience of foreign lands peoples, etc., not otherwise easily secured is provided.

The power of film in clarifications and explanations of certain scientific issues should be mentioned. Such actions as animal locomotions, x-rays etc are presented in a very stricking form and manner. In this regard it encourages experimentation and research and provides opportunities for the development of critical thinking. Records of history of both places, persons and events such as wars or certain natural disasters are also best kept in the visual way.

Television can be viewed as an art form and in this regard it can appeal both intellectually and emotionally. The anthology of experiences that can be accomplished is wide and the styles used for their achievement are many: narrative, non-narrative, fantasy documentation, realistic, symbolistic, abstraction, etc.

In the house entertainment industry, the place of television is pre-eminent. In the advanced parts of Europe and America, it is estimated that over 90% of homes have the television box. The situation developing countries is rather similar. Although it is quite true that in countries like Nigeria, such is only true of the cities and other such neighbourhoods where they enjoy the services of public power supply, recent developments in rural electrification in Nigeria, particularly in Kano State - where the project is concerned,

have afforded a considerable proportion of rural dwellers the opportunities of television viewing.

In terms of socio-political issues the accomplishment of television are enormous. Its said that the provision of efficient television services can keep even bad governments afloat and kicking in power for periods longer than necessary. Tv programs are made to create illusions of sanity and efficiency on parts of the governments of the day. It is true that the next program for most people after having a contentive supper is to sit back and enjoy the features in the tv box before heading for their night rest. For people who do not do much more than tv viewing, that is aside of their regular works, it's necessary for the planners and programmers to make provision for a healthy balance of both educational and recreative and pleasureable programs. Such include dramas, musical shows, comedy and a host of other variety programs.

On part of the government and other groups along the hierachy, the television medium is by any means indispersable. It is true of many politicians and other top-notchers that to sit back and watch their faces on the screen is considered not a small asset and hence a motivating and sustainence force. The propaganda usage of the medium has already been pointed out.

It is true that it represents the most powerful organ of propaganda at the disposal of the government. A case in point is the manner and ways societal vices and indiscipline can be portrayed in a striking and revealing manner to the unsuspecting individual with a view to creating dispositions and opinions against same.

Those of us watching our tv screens at the current period are all familiar with the operation tagged as WAI for War Against Indiscipline. Whereas the print media and even the radio tend to present their cases and somehow be perceived in a manner that is relatively hypothetical, the visual experience afforded by the television is most effective. The viewer here sees a persons dress going to pieces as a result of strugging on the queue, rather than a situation as in the radio where he is lectured about such in a relatively superficial and apparently arbitrary manner. This is true as much for propaganda as for reality. Whereas in other media forms one is told of the Head-of-State having commissioned a steel project in such and such locality, the tv rather than informs reveal, thereby making the message a sanctity even to the suspecting and skeptical minds.

The Architect's Role:

It is important, perhaps, to define what exact role the architect can play in such an issue that is apparently only technical, that requires to an extent an unquestionable amount of rigidity of patterns of installations and mechanism of operation. Many a person might argue that the set-up of a television station whose main and in some cases only task is the transmission of some electromagnetic ware forms, might require little, if any, of an architect's role, calling into action rather the transmission engineers and other members of the crew.

However, much of the truth of this would depend on the way a television station is viewed. If in the case where the station is considered adequate with the only necessities being a box of room serving as the studio and a minimal of supporting facilities, then architect might need to look elsewhere to render his services with his role here being very minimal. But the more appropriate way of giving the television its rightful place, as that of a principal media institution that virtually houses all the others; theatre, film and radio and also an avenue where all the fore-mentioned take place in varied form and extent, then the architect can no doubt make a big case out of any television station.

Specific areas of interest of unquestionable concern to the architect:

- Studio size, form and function as it affects the respective activities taking place within it, the need or otherwise of varied studio sizes and platforms;

- Stage design and how it can blend with television requirements, its manveverability or lack of it, scene and back-sets design and their proper integration with studio technical requrements.

- Special requrements as regards acoustics and lighting; the relation between studio size and effective acoustical control and treatment, architectural solutions to studio acoustic requirements lighting problems of studio area and solutions to the negative bye-effects of the stingent and intensive lighting requirements; the effects of size and form on the amount of lighting needs and the effectiveness of installation.

- Siting with due regards to environmental factors capable of causing interference and effective protection from against same; siting with due regards to transmission attitude and other requirement; regards to environmental pollution sources; regards to accessibility to public, staff and prospective customers.

These, among others, distinctly calls for the services of the architect when coupled with such

requirements as the detail planning of the interior in respect to acoustics, lighting, airconditioning, etc.

The Scope Of The Project:

In determining the scope of the project the following factors should be taken into account:

— Project is a life project that is to be supposedly financed by the Kano State Government, and in this light the financial side of the matter should be considered;

— The educational and scholarly requirements of the project;

— The realities of the present day television stations that were established with due regards to their workability and technical requirements;

— The existing opportunities for improvement vis-a-vis the technical requirements and the necessity for flexibility of the design owing to the rapid every day development in electronics and the continual change of equipments, tools and apparatus.

The work will seek to be both intensive and extensive depending on the particular sub-topic. However, in either case we should not forget that we are architects and issues that lack relevance to architecture howsoever would not be looked into.

Therefore, the barest minimum necessity should be expected where issues dealing with electrical and electronic equipment are discussed. One needs not to have to wonder when going through this piece, whether he is taking a course in electronics, engineering or even sociology.

However, much as important the architectural significance and intentions of the project is the nature of the topic necessitates occasional diversions into certain technicalities. An understanding of the television transmission system, program production, ways and means are by all means indispensable. There's no doubt that the architect's job, the physical planning of the station would be affected by the fore-mentioned. While introduction of pure architectural issues and form is not ruled out in the design, it is necessary when embarking on such to give due consideration to the technical requirements in physical setting. Most importantly the rigidity or otherwise of patterns, settings, operations and processes is a necessary determinant in the extent of architectural freedom in the choice of form either for some specific function or for the whole station. Some obvious situations of natural rigidity should no doubt be left as such for the benefit of function which is paramount.

But it is also necessary to study and review even narrow possibilities as probabilities of betterment in either efficiency, cost of production or both might exist.

The aspects of special requirement for the purpose of television is undoubtedly critical and would receive special attention. It is common fact that the smoothness of both picture and sound reception does not end with just the provision of even adequate studio sizes and forms. Acoustical considerations to even a very minute degree would have to be considered. The determination and provision of due conditions for the respective studio function. (This among other things also calls for variance and specialization of studios). Such minute issues as the determination of ideal reverberation times with respect to function of the particular studio. Ways and means, both natural and artificial of achievement of ideal reverberation times through either design or by use of proper manipulations and devices.

Another such area of concern is lighting. Lighting and television are by no means separable, since it is the proper lighting that provides for the sensation of vision - the main theme of television. It becomes more important because of other stringent studio requirements, particularly that of acoustics that make necessary the provision

of lighting being artificial. This and the necessarily high level of it in-turn provides another bye-effect that is by itself undesirable. Here due consideration of the habitation of the studio interior itself must be given. It is necessary to ensure that, the talents that are at any rate as important to the production as the machines remain safe and comfortable enough to perform well enough.

Of special mention among what the project seeks to achieve, is a look into the drama or stage aspect of television with a view to its integration into television stations. As mentioned earlier, this poses not a small measure of challenge as it specifically calls for integration of studio or filming requirements with the requirements of the drama stage. Much of the truth of this is dependent, of course, on the particular type of staging that would ultimately emerge, giving the innumerable constraints.

Generally, it can be seen that a fairly wide scope is envisaged of the topic. The intensive requirements of many of the issues also add to its overall significance in both scholarly and professional aspects.

CHAPTER - 2

TELEVISION SYSTEMS AND TYPES

TELEVISION TRANSMISSION SYSTEMS AND TYPES

Television has already been defined as the science of transmitting rapidly changing pictures from one place to another. The transmission of television pictures involves the use of radio waves, but in some applications such as closed-circuit television (CCTV), wires or cables carry the signal from one point to another. It is significant to note that two transmitters are usually involved in the transmission of television signals. One is used for the transmission of the picture (or video) signal. The other is used for the transmission of the sound (or aural) signal. The blending of these two signals actually takes place in television receiver set and the timing precision gives the viewer the desired illusion of a mono system.

Fig. 2.1 shows a simplified block diagram of a television transmitter. The TV camera converts the scene being televised into electrical impulses which can be amplified and transmitted.

Scanning and synchronization of the picture is done by the camera tubes; which makes it necessary to supply the voltages for this purpose to the camera. Next the signals are delivered to the video amplifiers and mixers. The amplitude-modulator then receives the signals, which is a form of AM transmitter.

For purposes of colour television scenes, the out-put from the colour tv camera goes through special colour processing circuits. Basically, colour transmission involves the use of special colour tv circuit to super-impose the colour signal onto the already existing monochrome signal.

For the purposes of audio transmission, a microphone, audio amplifiers and a standard FM transmitter are used. This is completely separate from the video system. However, both are transmitted from the same antenna using a special coupling device called a diplexer.

Closed-Circuit Television (CCTV):

So far TV transmission using electiomagnetic waves has been discussed. In some cases, such as in CCTV, the signal is transmitted from the camera to the receivers along a coxial cable. In this case the signals are not receivable by the general public.

This system is mostly used in educational, industrial and private establishments.

Cablevision: Also signals are transmitted along coaxial cables. Signals can be delivered to stations that are out of large of the transmission station. Special payment is due.

MATV:- Master Antenna TV where a whole neighbourhood employs the use of one antenna.

CATV:- The community antenna television uses the MATV system to distribute signals to disadvantaged sites and terrains, like valleys. Facilities consist of a receiving antenna and a small head end building containing the electronic equipment. Some have austere studios suitable for local news and interviews.

Satellites and Relay Stations:

Unlike the case for radio broadcasts, tv transmission range is "limited to line-of-sight distance" which is approximately about 50 miles radius from the transmitter, the value of distance, however, varying according to the terrain characteristics.

Apart from the use of MATV and CATV, Sattelites and relay stations are used to convey signals beyond this line of sight distances:

i. Passive Sattelite: This is the one mostly used. It receives a signal, amplifies and retransmitts it. It can be used even for intercontinental transmission.

ii. Relay Station: There are also repeater stations at intervals of between 50 and 100 miles and for the same functions as the active sattelite.

TELEVISION STATIONS IN NIGERIA:

The story of television stations in Nigeria is short but by all means remarkable. Television first came to Nigeria in October 1959, through the former Western Nigeria Government. Incidentally it was the first station in the continent of Africa. The Western Nigeria example was followed in quick succession by then Eastern and Northern Governments a year and three year later respectively. In 1962 the then Federal Government established the Nigerian Television Service (NTS), in Lagos. It is this station that is later to become the headquarters of the present day NTA.

Prior to the establishment of the NTS, the regional stations so-established where controlled by their respective regional governments and were run often in conjuction with radio broadcasting stations. The Nigerian Television Authority (NTA) Decree was not promulgated untill 1977, which later became an act with the advent of the civilian regime. The act gave the authority the exclusive right for television broadcasting in Nigeria and to take over all the then existing state stations and to set up new ones where necessary. In the mean-time the creation of states has seen the springing-up of television stations in virtually all the state capitals. These were only referred to as production centres and the NTA is to be the only dominant body. It is paramount to note that the act charged that "The Authority shall ensure that service which it provides, when considered as a whole reflect the unity of Nigeria as a Federation and at the same time gave adequate expression to the culture, characteristics and affairs of each zone or other part of the Federation".

This exclusive right of television ownership and broadcast hitherto vested on the NTA was taken away by the 1979 constitution which allows right of ownership to state governments, individuals and organizations that the president approves.

Recently the machinery to set up a television station for purposes of commercial and other profit making issues by some individuals and a British-based Foreign concerned was announced in Kaduna.

By the end of December, 1983, the NTA has 22 stations under its umbrella, structured into zones which each zone under a Managing Director and the whole structure headed by a Director-General as follows:

ZONE A: NTA Ibadan, NTA Ikeja & NTA Abeokuta.

ZONE B: NTA Benin, NTA Akure, NTA Aba & NTA Port Harcourt.

ZONE C: NTA Enugu, NTA Calabar & NTA Makurdi.

ZONE D: NTA Kaduna, NTA Jos & NTA Kano.

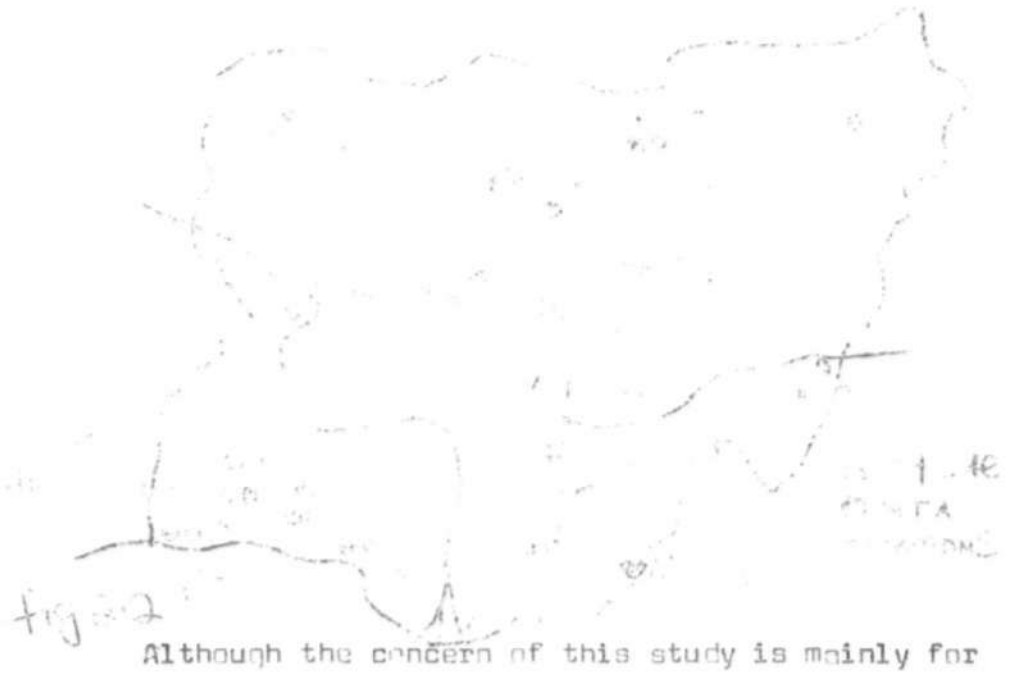
ZONE E: NTA Maiduguri, NTA Yola & NTA Bauchi.

ZONE F: NTA Sokoto, NTA Minna & NTA Ilorin.

Three other stations that make up the NTPC (Nigeria Television Production Centre) are NTA Lagos, NTA Abuja and NTA (2) CHANNEL 10.

Some state governments, have established their own television, some say out of political will. Among those in operation is the Kano State Television, known as the CTV (City Television) House to which this study is dedicated upon.

Television signals are transmitted in the range of frequencies of between 54 and 890 mttz in the VHF (Very High Frequencies) and the UHF (Ultra - High Frequencies). in Nigeria, authorities' regulations permits only the NTA Stations the use of the VHFs. Others, the state stations are confined to the UHFs range. Fig. 2.2 shows the distribution of television stations in the country at present.



Although the concern of this study is mainly for a station that is outside the jurisdiction of the Nigerian Television Authority (NTA), it is still useful to explore the functions of the authority for the following reasons:-

(a) The NTA still plays a dominant role in the television structure in the country;

(b) The state stations like the CTV, which is our principal concern adopt the older and more established NTA stations as a background and basis of their own evolution;

(c) There's a striking amount of similarity in terms of nature of programs (for a particular catchment area or state) kind of governmental involvement and control (the difference being that this one is federal whereas the other is state), sources of revenue, organizational structure, etc.

The functions of the NTA has been given as, among others, the following:-

i. erect, maintain and operate television transmitting and receiving stations;

ii. ensure the establishment and maintenance of standards and promote the efficient operation of the entire system in accordance with national policy;

iii. establish and operate a formula for sharing funds among stations;

iv. act as a liaison between Federal Government and the zonal operations;

v. plan and co-ordinate the activities of the entire television network;

vi. establish such number of production centres as it may consider necessary from time to time;

vii. specify the type of programs which should be transmitted by the whole network, and the quantity, type and contents of foreign materials;

viii. enter into arrangements with any person or authority for the purpose of obtaining concessions, licences, privileges and other rights;

ix. manufacture, produce, purchase or otherwise acquire films, gramaphone and other mechanical records and materials and apparatus for use in connection with the broadcasting services;

x. provide other persons with, and receive from them, matters to be broadcast;

xi. organize, provide and subsidize for the purpose of broadcasting, educational activities and public entertainment;

xii. collect in any part of the world and in manner that may be thought fit both news and information and to subscribe to news agencies;

xiii. acquire copyrights;

xiv. acquire public printed matter that may be conducive to advancing skill of persons employed in the broadcasting services, or the efficiency of the equipment used in the broadcasting services, or the manner in which that equipment is operated, including the providing by the Authority or the others on its behalf of facilities for training, education and research.

It's evident from the foregoing the control over public television stations in the country is fairly rigid and takes a definite pattern mostly on government's dijectives. The government involvement is notable when the fact that the management staff of any production centre and the NTA as a whole is made by the government.

Educational Television In Nigeria (ETV):

Although widely growing in popularity, in the developing countries, and in fact the world over, an educational television station does not exist in due country at present. Educational programs are transmitted, sometimes regularly, through the already established bodies of the other television stations, both network and local.

The Nigerian Educational Technology Centre (NETC), that uses television stations as its life line to perform its duties, sponsors regular programs, both for children

entertainment and instructional materials in the physical sciences as-well-as the humanities. The proposal for establishment of a National Open University in 1982, and its consequent take-off might make the setting up of specific educational broadcasting bodies in the country necessary. At present, however, any educational broadcasts are made through the existing public stations, and current television planners might find it imperative to consider their proper accomodation and integration.

Generally, for purposes of establishing specific educational televisions, several factors must be considered, among which would be the cost effectiveness of the scheme vis-a-vis its potential and the use of alternative solution; the need to utilize the unique learning properties of television as a visual medium and at the same time recognizing the powerful impact the medium has on individuals and also to take in account the presumed consequencies of threatening the classroom-teacher role, and whatever effect it has on both the learner and the instructor.

TELEVISION PROGRAM PRODUCTION:

The task of the production of television programs is by any means enormous.

Accuracy and precision on the sides of both man and machine, to the degree of fractions of a second, is necessary, since viewers become easily disillusioned and irritable with the slightest fault error in their screen. An understanding of basic tricks and processes is an impending necessity on anyone with the least involvement with the television, let alone its physical planner. This study would be made of the machines, and equipments, alongside the humans, the producers and programmers.

Production Equipments:

As earlier pointed out our concern here is architectural; and we should not be carried into discussing irrelevant technicalities in undue language. What is said here is about the barest minimum, in layman's term; and also how such is likely to affect the mission of the planner.

The Camera:

Any film making, and indeed photography in general starts with the camera. It is therefore a good avenue for starting our discussion: In terms of technical make and mode of operations, three types of camera exist:- Vidicon, Plumbicon and the image orthicon which

are used in film-making. Also lately coming into the cadre is the video camera. The mounting devices of each camera and its manueverability, among other things, determine the speed of repositioning (which is very important) within a shot or a sequence of shots The nature of movement of the camera is also important as it would affect studio size and form; and also running and production costs.

Lenses, of varied types, are associated with each tv camera. These lenses are referred to as zoom-lenses and might number as many as three to five, as in turret cameras, to only one as in most other cameras. The choice and application of the lense, is in a particular a determinant of the content of shot and camera positioning within the studio.

The core and centre of the tv camera is the camera tube. Generally, tv cameras are built around camera tubes of several types. For any camera in use, the result of the focal length is the most important factor. This is what determines how much the subject and its background will be taken in. Focal length of any camera tube in use has to reach on optimum between distance and proximity:-

— the longer the focal length; the shallow the depth of the field; the flatter the picture; and the more difficulty in the problems of focus and smooth movement.

— short focal length results in great exaggeration of depth, and can cause problems of focus and camera movement.

The camera tubes performs the role of the conversion of an optical image into an electrical image for transmission and consequent reception by the receiver. It's what the tv camera rube sees and converts into equivalent electrical impulses, that determines the form of the image reaching the receiver.

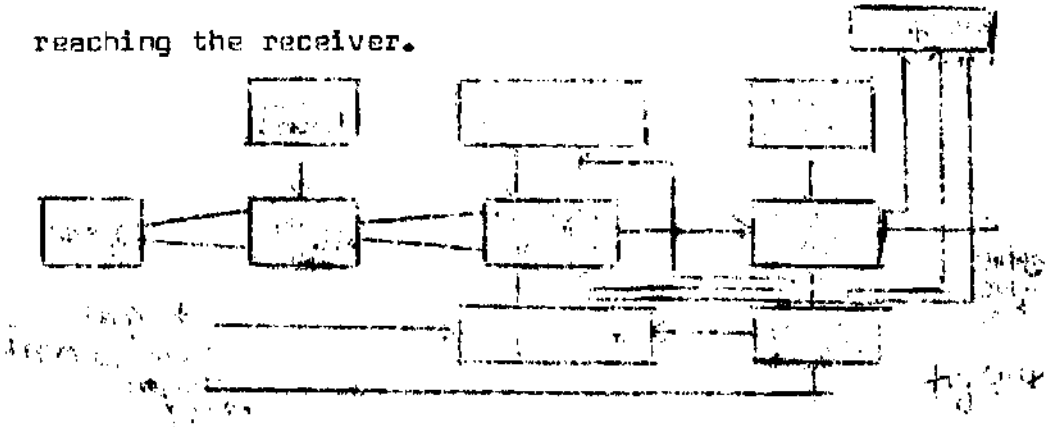


Fig. 2-4 is a simplified functional diagram of a typical monochrome tv camera. The process starts with the focusing of light by the scene on to the faceplate of the camera tube. (Note that the source of the light so-mentioned is the camera itself and also other lights in the studio). (This would be discussed in greater detail on the chapter on lighting).

A photo-electric process is involved in the transformation of the light image into a virtual electronic replica. A scanning beam performs the conversion of the picture into electrical impulses and develop it such that it super-officially represents the original scene. Output of the camera is then amplified for the purpose of the video signal not only for the transmitter, but also for the viewfinder mounted on the camera housing.

The reproduction so discussed here, apply mainly for black and white, or monochrome tubes. Nowadays however, colour televisions abound and are virtually displacing the use of the monochrome system. The addition of colour calls for the use of separate camera tubes for each of the primary colours. A colour filter system is used to separate the incoming light from the image into the desired colours and to focus each colour onto the face-plate of an appropriate camera tube. Separate channels of video signals is also necessary for each of the primary colours. (see also notes on camera operation)

The Camera Crew: Camera Man, Assistant (Dolly Operator):

The responsibility for composing the picture satis-factorily at any given moment rests on the camera-man with only occasional instructions from the director.

When the camera-man is carried on the camera dolly, there must be somebody to position the equipment (oncoming shots; sceneries; stills, etc) and this is performed by the dolly operator with instructions mainly from the director and also from the camera man.

The cameraman will generally adjust the brightness and electrical focus of the viewfinder, but pre-set controls are done initially by the maintenance man. Optical controls such as focus and the correct choice of lens are his chief concern. The output of each camera is taken to the vision control room or Camera Control Unit (CCU) as is more widely called. Here the operational controls for the camera tube are located. Here the operator has picture and waveform monitors to allow him to adjust lift, gain and gamma so that the best picture possible is obtained. The outputs from here are then fed into the production control room. Here both the picture from the camera and telecine are monitored. From here the outputs are sent to the Central Apparatus Room (CAR), from w where they are fed to the transmitters. All signals from the CAR pass through the Master Control Room (MCR), where continuity control is excercised. This is the seat of the Transmission Controller of the station (person in charge of on-air transmission).

It would be seen from the foregoing, that is necessarily brief, that picture production, which is the main issue in the televising process, involves a rigorous task with a stringent chain of checks and balances; involving and requireing precision in both timing and execution.

Sound Control:

Alongside the vision production line is the sound control line and most of the channels and controls are also true of sound as they are for vision. In place of the dolly operator for vision, there's for sound a microphone boom operator. His job is to ensure that the microphone is in such a position that it can statisfactorily pick-up the required sound. Also of equal importance, he must ensure that the microphone and its shadow are out of picture in some programmes. As is with case of the camera control unit, the sound supervisor in the sound control room selects, balances and controls the various microphones and recorded outputs. In place of the telecine insert, his inserts would be in form of tapes, gramophone records, etc.

Telecine Operation (television-tele; Cinemar-cine):

This operation derives its name from the two words "television" and "cinema". It is manned by an engineer and deals with the conversion of all programmes

originating on film (not for tv purposes) into television signals. A number of telecine machines are usually employed. Sound signal may be recorded optically or magnetically on the film. Proper synchronization of the picture and the sound signals is absolutely necessary.

The mechnical flying-spot telecine uses a light source whose spot is deflected horizontally and vertically to produce a raster having the same live and field frequencies and aspect ratio as the natural tv picture. A single stationery frame can be brought to life as the machine is started up.

Telerecording:

As program being produced are fed into the CAR an outgoing line from it ensures its telerecording to be made either on film or magnetic tape. The vision electronic apparatus has to be prepared before a recording, the signal processing units being line-up to correct for the various aberrations of the overall filming process.

The sound channels must also be line-up to give the conditions required by the sound track of the particular film in use. For higher quality recording, sound signals are recorded on a separate magnetic truck.

Editing:

Editing involves the cutting out of unwanted portions of the produced film before it is actually televised. In some cases additions can also be made. The job is done by the film editor, and takes place alongside a film previewing unit. In film production, the job of edition should be made a minimum as possible. That is to say that the less editing a film requires, the better its quality of production and of course the cheaper the cost of production. Studio size constraints, amateurish staff and poor directing, may all add to the amount and nature of film editing required. Certain types of editions involves matters of broadcasting policy of the station which are subject to periodical reviews and hence necessary from time to time.

Maintenance:

All along this line of production and in the studios regular checks and repairs are necessary. Camera channels have to be checked prior to rehearsal and transmission. For the purpose of major overhauls and repairs, a base maintenance area exist (usually in excess of one). This has to be located with regards to the weight, size and versatility of the equipments to be repaired.

Proximity of this to the CTA and the control rooms in particular is important.

Camera Operation, Ctd:

Camera use and hence operation differs according to nature of programs. For programs such as talks, demonstrations, sports, etc, the camera merely fullfils a reporting role and the creation of suspense and anxiety is not needed. For programs such as drama, however, the camera is expected to make a visual interpretation in an interestinting and even thrilling form of the program material. For example, the use of a sudden close-up of a face can increase tension at a dramatic moment, or some particular camera movement can give an impression of increased space and depth.

The weight of the camera, is of the order of 100 lbs. Nevertheless construction of the panning head is such that the centre of gravity is maintained over the centre of the base, and the camera does not move with a tilt of its head. Horizontal movement of the camera head is up to 360^{0} and vertically it reaches 50^{0} on either direction. Focus is maintained by movement of the camera tube in relation to the lens by direct mechanical link.

There are two types of camera mounts; - those designed for operation by the cameraman himself and those operated by one or more additional members of the camera crew. Generally, the former is the one most used, for cheaper operation. The one-man operated mounting is normally a camera pedestal with manual raise and lower to and from the centre column. The camera and its panning head are counter-balanced to make height adjustment easy. Tracking while transmission must be carried out very smoothly, and in such cases a motorized dolly would be preferred. Here the dolly is power-driven and controlled by its own operator. (see also section on light).

Picture Composition: Camera Shots:

A shot may be defined as what appears on the tv screen at any given instant. It might change either by movement of the subject, or more commonly by the camera movement. The importance of the shot lies in the fact that, a series of it make up the film, and it's therefore a determinant of the degree of satisfaction of the viewer. Shots can be classified in a number of ways:-

(a) Field of View:

In terms of field of view, we may have:-

i. Extremely long shot and long shot;

ii. Medium close-up and close-up shots;

iii. Medium long-shot and long shot; and

iv. Tight close-up and the Extremely close-up shot.

(b) Area Visible:

Full figure shot; Knew shot; Thighshot; Waist shot; Bust shot; Head shot and Tight Head shot.

(c) Camera Angle:

Low angle shot and High anle shot. Low angle shot can be achieved either by lowering camera or by raising stand of subject. Similarly high angle shot can be achieved either by raising camera or by lowering subject.

Apart from the types of shots some non-conventional shots occure:-

i. The Reverse Angle Shot: When a camera takes a shot of the subject from the opposite direction from which it has just been seen. Usually two cameras are needed, one opposite the other, but at less than 180° to avoid one camera appearing in the field of view of the other.

ii. The over-the shoulder shot: This is popular in dramas and some interviews and is applied mostly to group of conversing people.

iii. The Overhead shot: This involves the placement of the camera directly above the subject to achieve some dramatic effects; e.g. over a group of people involved in an indoor game, such as ludo, or over a whole sports stadium. It's expensive.

(d) Camera Movement:

i. The pan-Horizontal or vertical movement of the camera head using the panning handle.

ii. The tilt-Vertical movement of the camera on its mount.

iii. The Dolly-Movement of the entire camera away or towards the subject.

iv. The Truck-Movement in any line that is neither towards nor away from the subject.

v. The Zoom-Zooming permitts variation of focal length during, shot. It allow for quick and easy change in composi-tioning. It is one of the commonest camera adjustments during composition of picture.

Having seen the v rious types and nature of shots, one might very well wonder how these respective shots are merged to provide an illusion of originality of

sequence. Processes of shot to shot and scene to scene transition include fading, cutting and dissolution.

In the "Fade" the brightness or gain of the picture is adjusted either to fullness or to nothingness (zero) as in "Fade-in" and "Fade-our" respectively. Usually the fade is a sign of a major discontinuity. A slow effect might be thought of having the same effect as that of the descending curtain in the theatre; whereas a fast, and barely noticeable fade, simply serves to get us from one scene to another.

The "Cut" represents an instantness change from the picture of one camera to that of another and is by far the most common. It is done even in "still" programs as discussions, news, where more than one camera is involved or film inserts are to be made.

When the superimposition of a fade-out is done on a fade-in, a "dissolve" is said to have taken place. It indicates a minor discontinuity in time; to smooth or decorate camera-to-camera transitions in music, dance or other non-dramatic productions.

So far in this chapter an attempt is made to orient us in the briefest possible ways of television, film productions processes, ways and means. In the course of this we have necessarily touched on the human side of it,

i.e. the talents and the programmers. It's imperative to note that the role of the machine, paramount as it may seem, cannot per se make for a successful and interesting programme. The role of the people, in particular the actors on stage and the director are perhaps the most important determinant when the issue of quality appraisal is raised. Their role, ways and means, would be discussed briefly here.

Television Program Producers:

In the course of one discussion on processes of television program production, we have necessarily touched on the human element, i.e the operators of the production tools. A brief attempt would be made here to orient ourselves with the other side of the manpower, i.e the performers themselves, their jobs, styles and means. For adequate planning of any studio, theatre or stage it's necessary to know how the actor thinks, tricks and manevevers to the optimum satisfaction of his audience.

The Actor

We are all familiar with the job of the actor in any theatre stage or studio. The actor here might be anybody featuring on the screen for a shot or a sequence of shots to act, say or inform his audience (viewers) on or about a particular aspect of the play, film or

documentation by means of either speech or action or both. It might be quickly pointed out that any acting of any sort is subject to directors guides, commands and prescriptions.

The most important task as regards any sort of acting is the ability to create the desired illusions and belief on parts of the viewer. For example, an actor who is required to perform on all or most part of an hour drama feature program might have a whole text as his script. In many cases memories and rehearsal prove inadequate and certain tricks have to be employed to achieve the desired objectives. The task about any trick lies in the need for conviction of the viewers that is reality. To achieve this camera techniques are not enough by themselves as for instance, in a drama or profile where actor has to read and yet face the camera in the studio, without letting his audience aware:-

1. "Cue cards":- A person transcribes a written script onto a pasteboard of moderate size, say 40 x 60cm. These are numbered to keep them in order. The cards are held near the camera lens or in other position where the performer

is expected to look frequently. The card holder must be knowledgeable about the script so that he or she follows and knows when to make a change.

When the number of performers is in excess of unity, it's necessary to have more than one set of cards and hence their holders. For example, for two conversing people, it might be necessary to have two, one set for the actor facing left and another for the one facing right. The cue-cards might be placed behind each performer, and the other talent reads from over the shoulder of the first.

An alternative to the cue cards is to use a large portable chalk board for the whole studios or scene, placed from where all the performers in need would have the best view possible of it.

ii. Crib Notes: These are notes and points quickly prepared and prepositioned on, within or near the objects the performer has been lined to accross in the room or scene. The actor pulls open a drawer and secretly reads a notation there, takes out a tray and reads something tapped to it while taking it to the

dining table. Next he reads from the table-top while making his coffee, and also reads from the bottom of the milk can while pouring out the last drop, etc.

iii. Tape-cutting: A very common trip by studio documenters or field reporters in use. The reporter stands in the scene with a conspicuous and defiting poster or sign board at his background, and the action is shot. They memorize only the beginning and probably the ends of report; whereas in the interim the camera shows actually the scene and the noise of the reporter reading from his script. Editing is done to ensure that all parts showing the reporter looking down and reading his reports is cut away or replaced by certain of the prerecorded shots and footings.

Use of Television Monitors:

Where studios have a space unused monitor cueing-up process can be conviniently accomplished using same. The process is less cumbersome and simply needs an operator of the normal video machine. The positionning of the monitor vis-a-vis that of the performers is the same as for the chalk-board system.

It is essential to note that in all of the few film-tricks used by directors and other factors, mentioned here, the most important consideration and pre-requisition for success is the talent himself. The use of each system depends also on the very nature of the play, a film to be shot. For the planner the important thing to note here is necessary consideration for space requirements in due respect for the particular purpose of the studio or theatre. Since it is almost impossible to provide for a separate studio for each and every type and category of a feature program, the average type of action and shooting with all their necessary and ancilliary tricks and requirements for such should be averaged out in arriving at the necessary space's both form and extent

The Director:

It has already been mentioned that the responsibility for composition of any film or material rests on the director. His task is to ensure the success of each shot in achieving what it seeks to potray, to harmonize between sucessive and all other shots and to ensure overall efficiency in terms of the cost of production.

The Production:

The producer is responsible for production of the film from the original transcrps. He may either adapt an existing play from book or manuscript or may conceive same himself.

The Writer:

He writes the play in its original form and may sometimes be the producer. Most often he might not have any connection with the filming process and initiation and might only be required to assent to the idea to use his work.

The Presenter:

The presenter of a program does some preliminary introduction about the play or feature and is little else required, except at the end or sometimes middle of the program; when some form of continuity is desired.

The Sponsor:

These are groups or agencies usually with commercial interest who bear the responsibility of the cost of the air time of the programme.

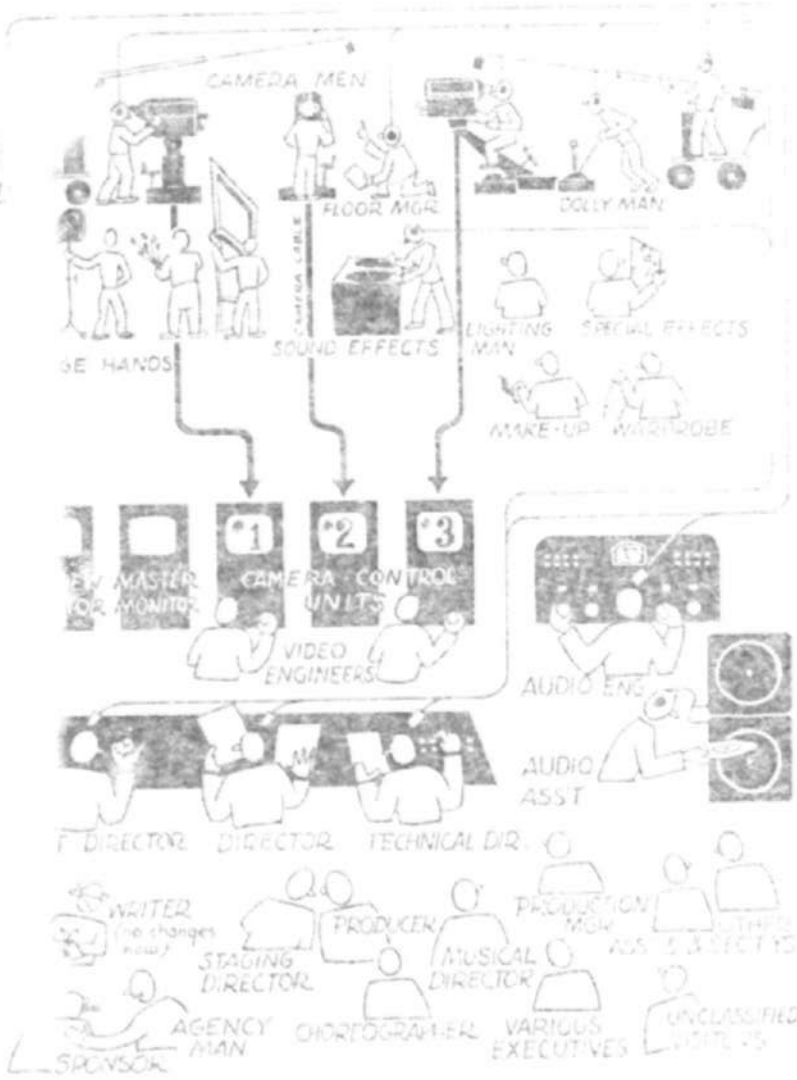


Figure 2-7 Studio and control-room personnel involved in a large studio production. Musicians and performers are not shown. Observers at the rear of the control room are rarely all present at the same time, but all can have access to the control room. It is common practice for the video engineers and the audio engineers each to have their own control room, or booth, in vehicle adjacent to the production control room.

become cameraman at each camera and possibly, thereafter, invisibly, as floor manager who is also the complete floor crew.

Going even further toward the end of the "limited personnel" spec-

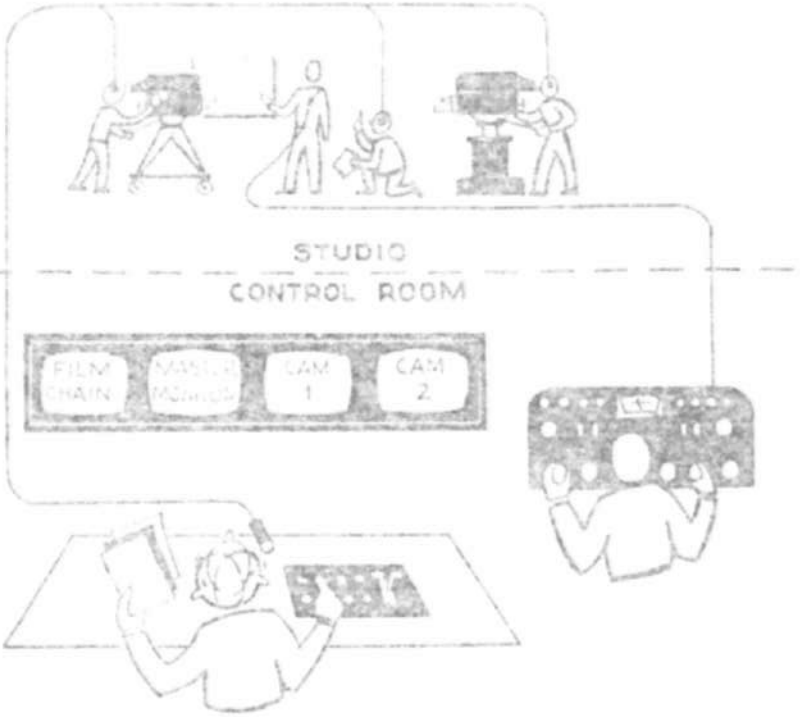


Figure 2 Studio and control-room personnel involved in a typical small-station local program. One performer is shown, indicating an educational program or a news show. The director is simultaneously following the script, watching monitors, and doing his own switching. He may also control projectors, watch timing, and make simple video adjustments.

trum, some instructional television centers have simplified production to the point where they can operate with a one-man crew. By the mid-1970's, a number of universities, including Southern Methodist, Stanford, the University of Michigan, and the University of Pennsylvania, had begun operating "classroom studios." In these facilities, professors teach on-campus classes of twenty to thirty students while simultaneously reaching hundreds more in special receiving classrooms at distant points. Many of these distant installations were set up for their employees by industrial organizations such as ITT, Telephone, Bendix, Chrysler, General Motors, IBM, and many others to permit employees to work for advanced degrees, usually in engineering and business administration, on company time. Classrooms in participating company buildings are frequently linked to the campus classroom studio by telephone lines, thus permitting two-way radio communication during live presentations.

A typical originating classroom of this type is equipped with three

They have no hand whatsoever in studio operations and are satisfied with occasional intermittent adverts of their products.

Fig. 2.7 is a diagrammatic representation showing personnel involved in studio film presentation. Certain of the persons shown might be absent in some programs depending on needs and nature of the program.

CHAPTER - 3

TELEVISION STATIONS TODAY

Present-day television stations are as varied as they are numerous. Architecture in terms of form is virtually non-existant. What is even more unsetting is that many television houses, where not originally designed for that purpose. However, it is unfair to completely write-off what exists at present since many serve their purpose, even if preponderantly. Also, even in the stations designed for the purpose, the absence of form need be condoned if we take congnisance of the rigorous technical requirements and settings necessary for function which is paramount.

Essentially, a television station may be consisting of only the studio and a handful of supporting facilities adjoining the studio and of course the transmitter. This is the case as in hastily prepared stations like the CTV in Kano. It should also be noted that the nature in terms of form, size and extent is dependent on the function of the station, i.e whether a station only serves a minimal of local needs, or whether a network station serving as a feeder to some smaller stations. Other variables would include extent of audience involvement, nature of staffing for the station, financial constraints and certain

government regulations.

In the study of existing television stations, our task here is to make a critical examination of what is provided for any particular station, its adequacy or excess, its proper positioning with respect to the other features of the station with regard to the function it is to serve. We should in particular take note of errors with the intention of avoiding them. Also an appraisal of protocol and dogmas is necessary for a complete review and dignosis of the television housing system.

It should also be noted that there is a remarkable similarity in the problems being experienced by existing television stations. This include inadequacy of storage spaces around the studio, leading to the inevitable cramming and jamming of the studio, thereby reducing manueverable space, and hence efficiency. Other problems centres around the limiting number of studios and the absence of any relation between some particular studio size and treatment and its function.

The CTV:

The CTV which is to be our main concern does not provide any substantive avenue for research. Established at the beginning of 1982, transmission actually took-off by 7th October of the same year.

Its present area of coverage spans only to a radius of 125km from its main site at Hotorn at the outskirts of the municipality. It's expected that its transmission will cover the whole state by 1988.

Its main site is a small stretch of office buildings within the government house at Kano. Some other office b buildings are at Sokoto Road. Yet others are housed within the Ministry of Home Affairs and Information Off Zaria Road. The government house building represents the nerve centre, housing most of the technical divisions of the station. The studio and all its controls and monitors are here. Also necessarily sited here alongside the studios is the Engineering division to effect and oversee transmission. The offices here include those of the production crew of the programs division and also that of the top administrative cadre including that of the Managing Director. The Sokoto Road offices houses the News and Current Affairs Division, whereas the Commercial and Finance Division is housed by the Ministry of Home Affairs and Information. Also located here are most of the storage stores for spare parts, unit equipments, etc.

The disadvantages and limitations of this arrangement are obvious. Apart from the difficulty in co-ordination and contact necessitated by distance, there's also

the problem of precision and speed in the common cases of break-down or other emergencies. Another major problem is the inadequacy of the studio size and also number. The acoustical atmosphere provided within the studio is also wanting as a result of the absence of walling providing an effective sound attenuation, the absence of sound-deadened walls and the changing acoustic atmosphere necessary due to the random storage and use of both props and back-sets making any pre-determination of reverberation time difficult if not impossible. Also the meanly housed controls and monitors as-well-as the MCR does not help matters. Office spaces is woefully too small and contact with the general public is the barest minimal due to stingent restrictions of any entry into the Government House- this negates interaction with viewers and would be artists and hence not helpful to the success of audience related programs.

Generally, the case for the present facilities of the CTV is inadequacy. This probably is needless to mention. Perhaps in realization of this officials are making finishing touches, the first phase of their movement, to their permanent building, the first phase of which is just nearing completion.

airconditionning plant. The storage area for props is lined alongside the other main facade and is separated by a very wide corridor from the former. Some engineers' offices are also present here. The ground floor of the other block accomodates the rest of the supporting facilities for the technical section and also for the whole station. These include an engine and a generating plant room, a spare parts storage, a prop storage and an electronics' storage (see plan). Also housed here is a kitchen and an adjoining dinning area, now not used. Three more floors on this block serve the administrative offices' need. The programs division, the commercial division, the news and current affairs division, the administrative and parts of the finance division. The rest of the accounting division is consoled in a three-sided corridor-lined single-storey building at the background of the site near a garden area. The only other major structure, apart from the mosque, is the mechanical workshop. This is a building consisting of parts in zinc-shed while the rest in concrete. Its parking spaces serving it are lined away from two of its sides. The mosque as a praying ground is placed next to the visitors entrance within easy reach to the outside. Next to it are few visitors' car parking spaces. The other gate caters for the interest of workers and a elaborate car and cycles'parking spaces are lined along this route on two sides.

Generally, the site is a very gently sloping area and might be considered flat except for the small stream living it passing down towards the main road. Farmlands at two sides along the line of fencing provide ample room for expansion in these directions. The small adjoining stream has been made used up by the provision of a garden area next to it. This is used for the shooting of some outdoor progrems and stills and also for a general recreational spot.

General Advantages (CTA):

— Fully compacted with most necessary parts within easy reaching distances of each.

— Main maintenance workshop and stellite control panels convinient to the studio areas.

— Completely sound proof studio walls - no acoustic interference from outside.

— Adequate studio size for most functions.

— Full provision of all necessary electronic gadgets for lighting, camera, master pedals, etc and their controls.

— Adequate circulation space within this area.

— Provision of some engineering staff offices at this area which is essential.

— Adequate lighting provision.

Drawbacks:

— Provision of two studio sizes of exactly equal sizes: Non-utilization of one of the studios;
— Equal sizes studios do not give room for specialization of the studios; unnecessary wastage of space for some programs.

— Ready area for props not provided. This leads to unnecessary cramming of the studio space as the materials have to be left within the studio. This also leads to acoustical complications.

— Area provided for telecine operation is too small.

— Absence of previewing theatre for purposes of edition. Films have to be reviewed and edited within some small office space.

— Absence of any crew lounge for staff members of the studio.

— Absence of any artists lounge, for visiting talents.

— VIP waiting area not adequate.

— Location of certain engineers' offices here leads to certain difficulties in co-ordination.

— Mechanical workshop is too far from this area.

— Provision of some support facilities within the administrative block and facing away from this area is not ideal.

Offices Administration:

Except for the undesirable isolation of parts of the finance division off the main office block, area provided is fairly adequate, circulation and co-ordination is fair and ventilation provision is contentive.

Generally, the NTA Kano does not represent the most case study for existing for stations. Facilities are at least sufficient and most problems not insurmountable. Parking space provision is fairly adequate. Worth remembering, however, is the absence of studio specialization and varriance, and also the near absence of essential facilites for workers, canteen, cafeteria, etc. In terms of transmission technicalities, site does not pose any stumbling block or restriction. Its administrative organizational structure is similar to those of other NTA stations in the country. (see previous chapter).

Staff Strength of NTA Kano:

Administration and Finance Division	161
Programs Division	108
News and Current Affairs Division	35

Engineering Division		83
Commercial Division		7
TOTAL	=	394

The NTA Kaduna:

The NTA Kaduna is one of three stations that make up the NTA Zone D, the other two being NTA Jos and Kano. It's one of the oldest and also one of the largest television stations in the country, with present staff strength of well over 400. It was established in 1962 as one arm of the then Northern Nigeria Broadcasting Service, the other arm being the now Federal Radio Corporation (FRCN) Kaduna. Untill the take-over of all television stations by the Federal Government and their incorporation into the NTA, the two function as one and the same body in the name of RTK for Radio/Television Kaduna. Partly for this reason and also for the integration of the two on site any individual study of one has been made difficult. However, here only the television facilities would be mentioned and examined.

In contrast to what exists at the Kano station, the Kaduna NTA has a fairly varied form of studio sizes. Three stuios serve the needs of the station as a whole, with the third being the announcer's booth.

Studio A which is the largest is within the nerve centre of the Central Technical Area. It handles the most demanding programs in terms of space ranging from all forms of drama, traditional dance programs like "rythm 'n' songs", musical and other variety programs. Its adjoining control room at upper level with viewing panels does not function as it's equipped with outdated black and white apparatus. Hence an OBVan serves the controlling requirements of this studio. Within the latter one partitions for: (i) the director and the vision mixer (ii) An alclove for sound mixer, and (iii) an engineering section housing the CCU as well as the lighting engineer.

On the same floor as the stuio A control room is an area housing the transmission control desk and preview, number of patch rock equipments as-well-as the area. Also lined to this area is a small maintenance room and the NTR.

Studio C's variance lies in its smaller size and a monitor room at the ground floor level. It handles the Newstand, including the infamous "periscope", small and medium-sized discussions programs and some audience involving productions. Also lined alongside it is the camera console, next to the monitor room. General costume, and props storage serving various needs are located off this main wing accross a corridor.

Although as stated earlier original integration of both radio and tv facilities makes a study of either difficult certain point can be noted for NTA Kaduna:

— Studios look crammed-up and ill-furnished for the sophisticated acoustical needs of theirs. In particular acouetic conditions of studio A is poor.

— Obsolete facilities in control rooms for studio.

— Lack of solace and confinement in the master control desk. Leaving it open from more than one side might lead to detractions and interference.

— Lack of defined space for telecine operations.

— Overall area lacks any sense of place and co-ordination.

— Absence of any "green area" at or near studio for props adds to the clumsiness of the studio.

Some good points abound:-

— Proximity of archives to MCR and telecine is desirable.

— Provision for a film preview and editing room at the heart of the CTA.

— Certain engineering and technical staff offices near the CTA increases efficiency in cases of emergency.

The NTA Jos:

The NTA Jos represents a case of mediocrity in terms of both technical and supporting facilities provision. It's located off Mangu road at the outskirts of Jos. Four studios serve the need of the station, the fourth being an open air studio. Studio A is the major studio and serve the drama needs. Also large panel discussions and audience-related programs take place here. This studio is understood to be too small for certain large settings that are often required. It's interior is intolerably crammed with all sorts of props and backsets material as a result of the absence of any ready-storage area near the studio. Also corridors adjoining are such crammed. The storage spaces are either non-utilized or underutilized because of distance.

Studio B serves as the announcer's booth and news also take place here, while studio C that is located off the main block (see drawing) adjoining the open air studio. It's a small studio served with a 1 - 500 watt, 2 - 1500 watts and 3 - 1000 wats halogen lamps. Its worth-noting that both studio A and C are controlled from two respective Obvans, the facilites of studio C has not been provided with any. In fact studio C is a hastily added one to cater for the increasing traffic of programs recording the station needs.

The open air studio is a 30 x 25m paving lined with wall from only one side, where it's tied to studio C. It was formerly used as a lawn-tennis court. Artificial lighting is not necessary since recording can only take place here during the day-time.

The administrative and staff offices are also place in the upper floor of the CTA, while others - the News and Current Affairs Division is sandwitched between this block and the main administrative block at the approach of the building. Other supporting facilities are scattered at the background towards the area boundary of the site.

General Issues Of Concern:

- Inadequate size for drama studio. Poor acoustic condition in same.
- Lack of ready prop storage area around this and other studios lead to jamming of both within and out of the studio.
- Inadequate area for telecine operations; no provision of nearby storage for rack equipment.
- Area provided for VTR too small.
- Non-seclusion of the MCR region.
- Office spaces are not co-ordinated together.

— Staff clinic placed in a remote area; hence under-utilized.

— Furniture storage shed also too distant from the studio area.

— Poor acoustics in studio C due to non-insulative walls, allowing sound penetration during recording.

— Use of OBvans for the respective controls of the studios might limit the time of usage such vans can be put to, because of the duplication in function.

— Very poor air-conditioning system for studio A.

The London TV Centre:

The London TV centre provides us with an example of a long-standing station with credible workability. The plan view of its central technical area is as shown in the picture. The design compares favourably to the schematic technical needs for transmission. One important point to note is the presence of studio control at upper gallery making the job of monitoring and mastership of the studio operations easier. Also note-worthy is the provision for large scale viewing panels from all of the production control room, lighting and vision control room and also from the sound control room direct with the studio.

Also viewing ability between these three areas. (One might also note that in most Nigerian cases the lighting and vision control room may be one and the same room with the production control room. The separation of function could be as a result of the size of the necessary monitoring staff in both the two rooms. The very large provision of area for the central apperus is also another point of interest. However, this might be condoned with a correspondingly smaller central control or Master Control Room.

From the brief studies so-conducted and summarized here, we draw a pool of problems and lessons from both actual and hypothetical cases, upon which to base our proposals and seek to avoid.

Basic Nature Of Sound:

We can define sound as vibrations set-up in a surrounding medium by a vibrating body and producing the sensation of hearing to the body. The importance of the surrounding medium is a well known fact and would not be in our scope to prove or demonstrate this. The type of vibrations that do produce sound have several sources. Moduled air currents such as speaking, sirens, etc self-vibrating bodies like drums. Sudden changes or modulation in the air pressure, like shock waves.

Intensity and Loudness of Sound:

One of the most important aspects and peculiarities about sounds sensations is the difference between its intensity at source of production and its subjective interpretation by the receiver. Sound intensity is measured in decibels, and this is in a form of a logarithmic scale:

$$1 \text{ Bell} = \log_{10} \frac{1}{1_0}$$

1 - Intensity

1_0 - Reference Intensity $= 10^{-12}$ Watts/m^2

$$1 \text{ decibell} = 10 \log_{10} \frac{1}{1_0} .$$

As earlier said sound interpretation in terms of magnitude to the receiver is defferent from its intensity. How sound is interpreted by the ear is known as its loudness, and is dependent, on among other things its frequency. Thus two sounds of varying frequency, such as sound from a siren and a drum, of equal intensity do not have the same loudness. The unit of measurement of sound loudness is the phon, and is equivalent to the loudness level of 1 decibell of sound at frequency, f = 1 khz. Another important aspect about the audibility of sound is the variation observed of frequency of the threshold of audibility, with pressure or intensity remaining constant. The sensitivity of the average ear at different requencies is illustrated in Fig. 4.1. It can be observed that ear is most sensitive at frequencies between 1000 and 2000 Hz.

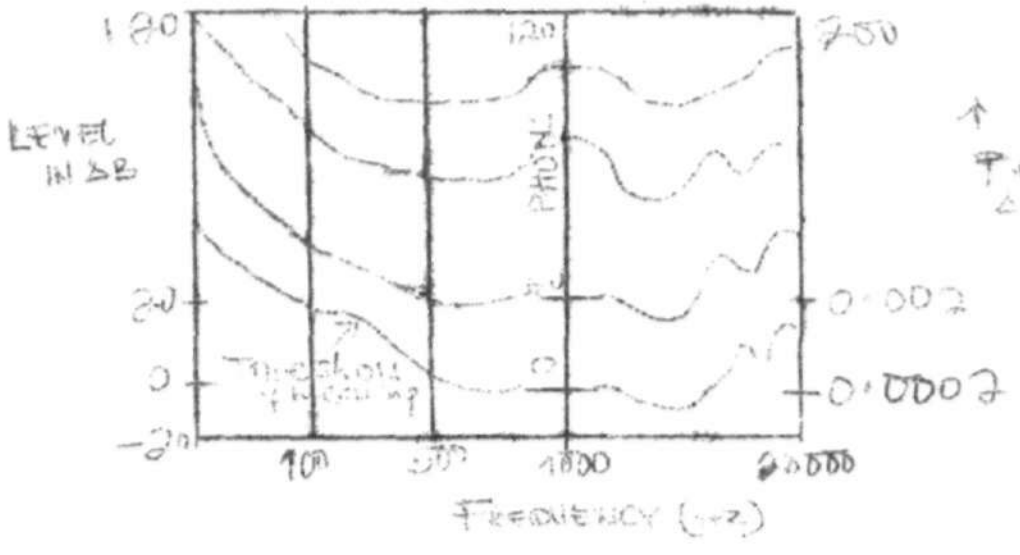


fig 4.1

It can be observed that the threshold of hearing for the human ear is given the level of 0db at frequency = 1 khz. Exposure of the human ear to sound intensities of over 120 db at frequency 1 khz can cause instant damage of the ear. This is known as the limit of audibility. This range of normal perception and interpretation of sound occurs at between 0db to 120 db (fig. 4.2). It should be noted that prolonged exposure of sound to intensities above 90 db can cause damage.

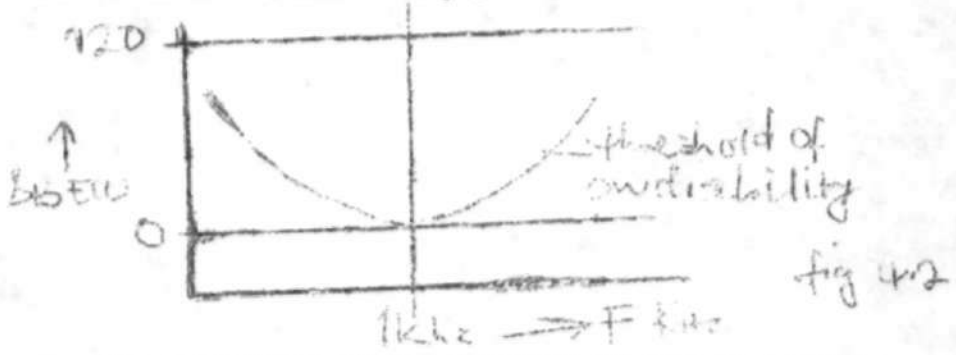
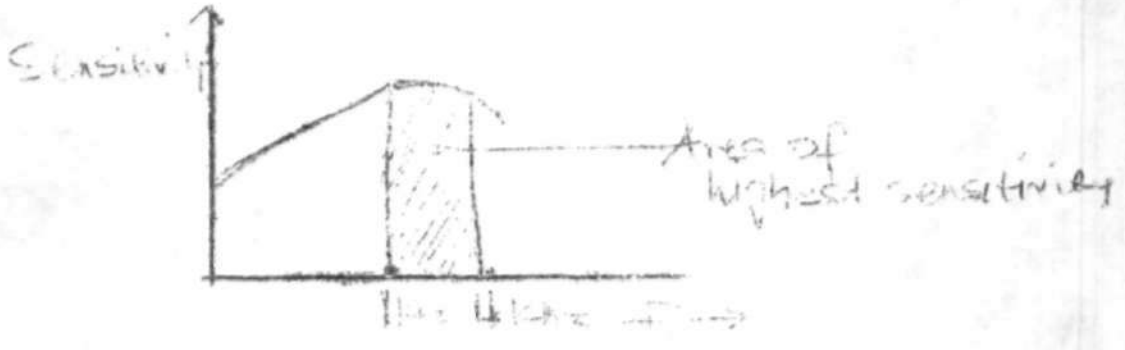


fig 4.2

The variation of sensitivity of the ear with respect to frequency has already been mentioned. The minimum frequency of sound detectable by the ear is 20 Hz and the maximum is 20 kHz, (fig. 4.3).



We are yet to define for sound a truely linear scale, i.e a scale in which sound level is doubled with a doubling of its intensity. This scale is known as the sone and is equivalent to 40 phons.

Sound Propagation and Space:

Much of the behavious of sound as it reaches a building is dependent on its frequency. At very high frequencies sound tends to have a ray behaviour, and has much of the characteristics of light. This is to say that sound shadow and direction is more important at high frequencies. At lower frequencies, it takes the wave behaviours, and the phenomenon of differention, interference and reflection are much more with it.

Specific Acoustic Impedence:

A character of material or medium with reference to how if affects sound propagation is known as its specific acoustic impedence, and is a comelex quantity. Generally, specific acoustic impedence,

$fc = P/U$ where P - pressure of medium

U - particle of velocity.

Generally material of high value of fc have a high amount of reflection.

Reflection coefficient is the ratio of sound reflected intensity over that of sound incidence. If if I_r and Ii, are the intensities of sound reflected and sound incident respectively;

Reflection

$$\text{Coefficient} = \frac{Ir}{I_i} = \left(\frac{Z - Z_0}{Z + Z_0}\right)^2$$

where Z = fc of incidence surface

Z_0 = fc of propegating medium - which is usually air.

if $Z = Z_0$, $\frac{I_z}{I_0} = 0$; no reflection. Therefore, where no reflection or little is desired material choosen at surface should have little or no difference of fc with that air.

Conversesely, if Z $\gg Z_0$, Reflection would be almost 100% of incident sound. In practice this is often not possible as, usually the fc for air is much lower than that of most common surface (or building) materials.

Intensity Absorbtion Coefficient:

The intensity absorbtion coefficient of a medium, a is a factor of its reflective coefficient;

$$a = 1 - r$$

$$\text{or } a = 1 - \left(\frac{Z_2 - Z_1}{Z_2 + Z_1}\right)^2$$

Therefore, the greater the absorption of a surface, the less the reflection and vice-versa. Therefore high absorptive surfaces are employed as acoustical aides in buildings or surfaces where sound reverberation is a nuisance.

Sound From Musical Instruments:

Of distinct and often peculiar characteristics is the sound produced from musical instruments. The variety of musical instruments and their variance and contrasts makes any talk on musical sound difficult. Scientifically sound waves from musical instruments represent a very complex wave form that contain many frequency components of different amplitudes. The quality of sound produced depends on the presence of these other frequencies and their amplitude relationship to the fundamental note. These are however required to be in harmony.

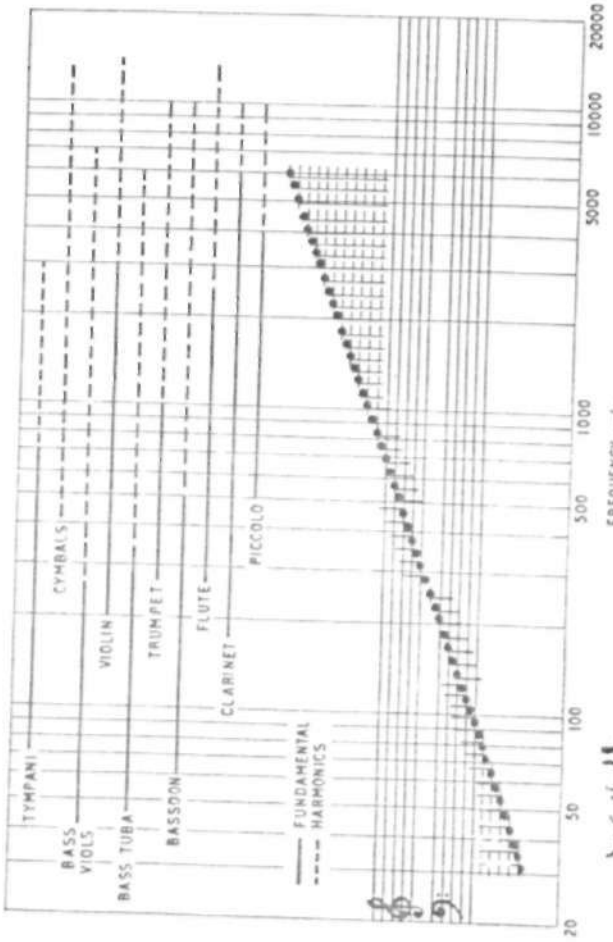


Fig. 1.2.4 Range of frequencies of musical instruments including the piano (by courtesy of the General Post Office)

Some of the frequency ranges of common musical instruments are shown in fig. 4.4.

Generally, music requirements and characteristics to be considered include:-

(a) Definition;

(b) Fullness;

(c) Balance, and

(d) Blend.

(a) Definition: - This refers to clarity and distintiveness of each instrument in the music set.

(b) Fullness: Refers to quality of production, i.e the richness of tone, the pleasing and satisfying quality of the sound.

(c) Balance: The supposed perception and interpretation of the sound from each instrument should be seen in the light of its magnitude of contribution.

(d) Blend: Whole sets of music has to appear and be perceived as a single entity. Perfect blend means music forms one homogenous mixture.

The brief conditions and requirements of musical sound highlighted here would be discussed, in relation to their implications in design of musical stages and studios later.

So far in the above passages an attempt has been made to orient us with certain basic elements in sound characteristics and behaviour. The objective is to prepare ourselves for the more directly relevant discussion on architectural acoustics with more specific regards to television requirements. Its desired that items discussed here would not have to be repeated; and a mention of these should be readily assimilated and understood.

Outdoor Noise:

It has been said that a first preliminary stage in the control of sound level within a building is first to ensure noise-free site; un-infected by outside penetration of sound pathways. Although most people are aware of the occassional nuisance caused by unwanted sound levels, few realize in specific terms, the reasons for due consciousness in noise control. As already pointed out noise can cause a damage in hearing, either instantly for an excessive

level or gradually after prolonging, distractions and annoyance which are common, heavy noise vibrations can cause financial damages by a quantom weakening of a building form either instantly of after a prolonged period of time. This is dependent on level and at times nature of the sound. Some buildings that need necessarily be sited in a particularly noisy site, capable of causing noticeable physical damages such as buildings near some air terminals are made to have some additional structural precautions, that of coursd add to the costs of the building. Noise can also cause unwanted interferences with speech thereby making certain necessary precautions obvious.

In television studios, apart from the general noise control requirements and solace needed in offices the studios are of special concern. Recording machines of studio have an unusually high sensitivity and hence the least noise infiltration into the studio should be avoided. Where studios are located adjacent to areas subjectible to vibrations such as air paths or heavy truck highways, extra special cares need to be taken in the building structure. As much as possible this should be avoided in the first place.

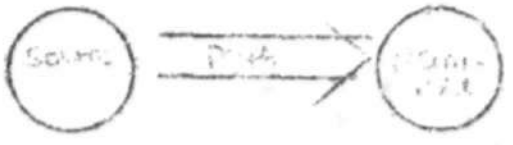
As earlier pointed out noise level per-se is not the only issue for evaluating the degree of tolerance for some particular sound. The type and nature of the particular sound, particularly its frequency content can determine the limit of its desirability. A high frequency, piercing sound might often prove more undesirable than the same level of sound with low frequency content. These in effect calls for a frequency pre-qualification of any sound source in determining its desirability.

Since the value of sound pressure level at some given frequency does not necessarily represent the total loudness, it is necessary to add the various loudness levels in the different octave bands, if a single value of loudness is desired of a single spectrum. Before the addition process of the response of the human ear to sounds of different frequencies, must be taken into account. Figs. 4.5a and 4.5b shows brief loudness level with respect to sound pressure and frequency level, and the response of the human ear to sound as frequency is varied.

Apart from scales used for assessment of noise, there are also scales for the reduction or attenuation achieved by different insulating or building materials.

Noise Control:

Noise can be in any of its three stages; at its source, at its path or at some receiving end.



At source, it can be attacked, i.e the producing machine is switched off. Alternatively measures are taken to ensure its instant absorbtion at the site. At path it can be re-directed or shielded away. The recipient should move as away from the source as possible, as sound obeys the inverse square law of distance from source. In practice all of the above are combined to ensure the most effective possible response as none of the methods ever proves 100% effective.

Noise control outdoor is synonomous with zoning and site selection:

i. identification of the noise consciousness of the topic or project;

ii. Selection of a relative quiet site for the television or where noise source can be reduced cost-effectively to acceptable limits and standards;

iii. Selection of suitable building materials, usually materials of high specific acoustic impedance are choosen; this being done with due consideration for sound characteristics; with particular regard to frequency variations and level of loudness in respective spectrums;

iv. Zoning of the building structure with regards to the tolerance capacity of each area; areas most sensitive, intermediate and least sensitive areas to interference, and this order is followed with respect to source and direction of noise in site planning. Interfacing of and among the areas so-identified and charactered is done.

As much as many as the factors, ways and means of controlling noise in preliminary stage, are also issues tending to prevent the achievement of same. In practise the say of architects and planners is often

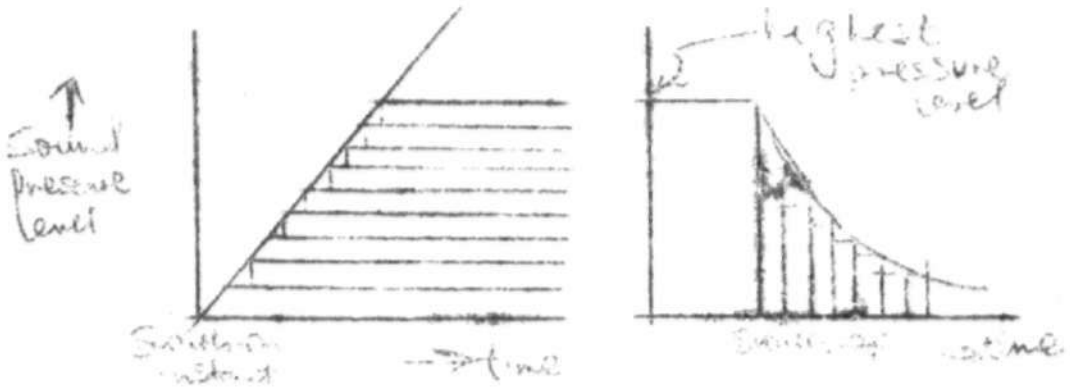
relegated to the background and government officials appear to be arbitrary. Issues of cost rather than environmental convinience tend to predominate, and most noise control practice is forced within the confines of the site. Even in this case architectural character might temper with certain zoning requirements. Acoustical control and attenuation is, hence, further forced into individual rooms. A specific look into room acoustics is therefore inevitable.

Indoor Noise Control Mechanism:

Accustical control and prescription of some particular room has been made difficult and complicated by an acoustical phenomenon known as reverberation. If predermination and maintenance of the sound level in a room is important, as it always is, account must be taken of not only the initial"intended" sound level but also of the reverberant sound.

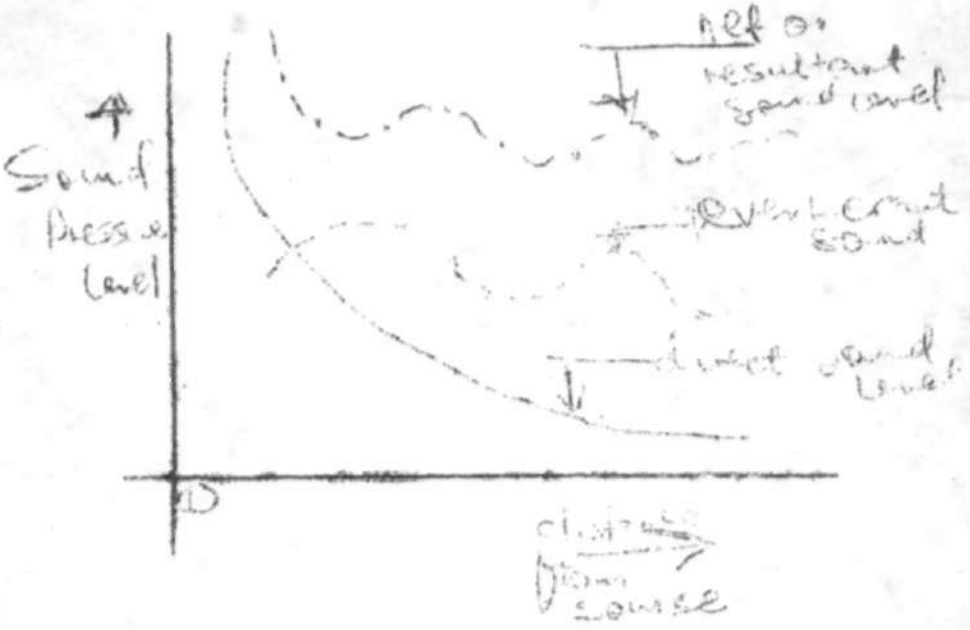
As earlier pointed out sound is a form of energy in forms of longitudinal waves capable of normal reflections. An observer in acoustically live room in which there's a source of sound receives sound directly from the source and indirectly from the reflections

on the wall. A live room is one that has most of the sound incident on its surfaces being reflected. This is to say that, theoritically, energy density from a source of sound in a room would continue to increase with each reflection ahd hence with time. The energy density will therefore be infinite, but this is not so due to the process of absorption and frictional dissipation. Because of the mentioned processes, in practice, the sound builds-up to a constant value.



Sound pressure build-up and decay

Because of the reverberation process, and the nature of the reverberant sound, the net or resultant sound level produced in an acoustically live room is diffused and higher than the intended level.



Because of this process of reverberation, the planning of acoustically sensitive rooms such as recording studios, theatres, etc has to take into account the sound level produced as a result of reverberation phenomenon as well as the original sound. It should also be noted that there is a gradual decline in intensity of the reverberant sound as a result of declining energy content with each reflection. The intensity of the sound from the images is reduced by the factor (1 -) for each reflection, where is the energy reflection coefficient. The sound field produced in the room will be taken as that produced when all the images and the source itself are switched on simultaneously.

Also earlier said the absorptive capacity of each material varies in the room, and is a factor of its specific acoustic impedence.

Suppose we define the average absorbtion coefficient in the room, , the intensity of a reflected ray of sound after n^{th} reflection I_n:

$$I_n = (1 -) I_{(n-1)} \qquad I_o - \text{reference intensity}$$

$$I_n = I_o (1 -)^n$$

The total energy density in the room is,

$$D_n = D_o (1 -)^n$$

n reflections would occur in time, t;

$$t = \frac{nd}{c} \qquad c - \text{sound velocity}$$

$$n - \text{number of reflections.}$$

Although a normal decay process of sound in a room has been shown, it should be noted that some modes persist and do not follow the simple decay process and time. It has been shown that in room of dimensions, d_1, d_2 and d_3 these would occur of freaue-ncies, if:

$$f = \tfrac{1}{2}c \left(\frac{l}{d_2}\right)^2 + \left(\frac{m}{d_2}\right)^2 + \left(\frac{n}{d_3}\right)^2,$$

Where l, m and n are integers. If sound source is stopped these nodes will persist and a normal sound decay is not observed in the room

This is to be strongly avoided as it increases decay time and hence chances of interference.

So far we have shown the importance of reverberation in room acoustics. We have shown how it can interfere with speech and quality sound and also how it can cause interference. What we have not shown, however, is that in some cases it can be useful. Apart from entrancing sound level in the room, much use is made of reverberation in music rooms, where richness is desired and in large halls where direct sound from speaker may fail to dominate. Also it can be used to create certain illusions as in dramatic studios where a small room is desired to look and sound very much like a large space.

Its therefore apparent that for any particular room there's an ideal reverberation time (RT) for some particular function. Reverberation time is defined as the time taken for the level of sound in a room to drop by 60 db.

Factors Determining RT:

i. Volume: It's apparent that the larger the volume the more the distance of travel of the sound says, and hence the longer the RT.

ii. Absorbtion: Absorbtion in air can be e either by frictional dissipation or by surface absorption. As the sound energy travels within air, contact with the particles causes its energy decrease and loss. So also is the case after stiking surfaces, walls, furniture in the room. An absorbtion has been noted to increase with or increase in humidity.

Another source of absorption within a room is the presence of audience . Each person in a room contributes to increased absorption of sound. This represents a problem as designers will have to take into account the presence or absence of people when, for example, designing an auditorium. This can be rectified by the use of padding on each seat, with absorption equivalent to that of the person, and then to design considering full presence of audience, as it doesn't matter now whether people are present or not.

$$RT = \frac{Kv}{A}$$

V - volume

K - constant; and

A - total absorption (Air absorption + Audience Absorption + Surface Absorption.

In practical acoustical designs, an average absorption coefficient of any room is determined, and to obtain the total absorption, this is multiplied by the total surface area of the room.

Use of Acoustic Materials:

(a) Surface Absorbers

Sound absorption takes place through fu frictional dissipations. Sound striking the material loses its energy because of friction of the surface. The more the surface exposed in contact with the sound the higher the absorption porous materials which expose with larger surface area to the incident sound than their apparent area suggest, are therefore much better sound absorbers.

Architects and planners should keep in mind certain basic facts about the application of acoustical materials in interior spaces. For example an acoustical material which is suspended from a ceiling, or otherwise spaced away from it, provide the greater sound absorption, than the same material cemented on the surface.

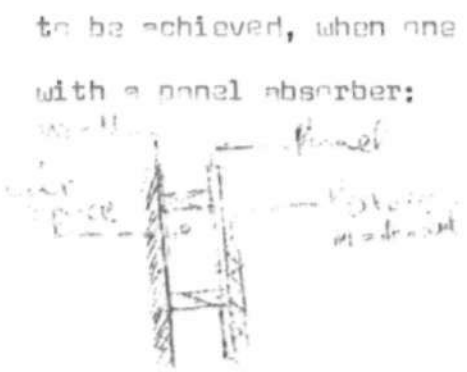
Therefore, an acoustical advantage is gained by suspending the absorber on furrying stings, for instance, see fig. 4.6.

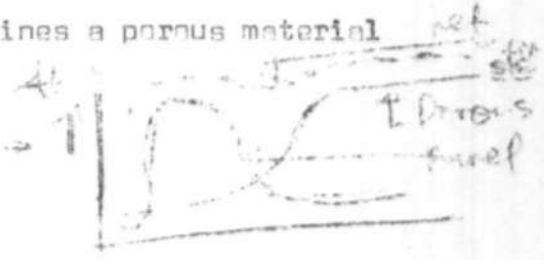
It is necessary to note the variation of the performances of absorbers with frequency of the sound. Porous absorbers have higher absorptive capacities at higher frequencies.



For panel absorbers, absorption is mainly as a result of vibrations set up as result of the incident sound energy. Their performance depend on their area density and very thin ones should be avoided, as they become a source of noise themselves. Commonly used is $\frac{3}{8}$" plywood panelling.

'Damping' the vibration of the panel is said to be achieved, when one combines a porous material with a panel absorber:





Partitions between each neck enhances the absorption capacity as it brings into play the effect of porous materials:



Helm-holtz resonators are generally expensive, and have good performances limited to the natural frequency of the system.

Increasing Absorption Through Furnishings:

Properly selected furnishings in an interior space. Can contribute significantly to the overall sound absorption in a room, and thus reduce the general background noise within it. Carpeting is particularly helpful, not only does it supply absorption, but also reduces foot-falls. They should be carefully used in studios where free movement of camera dolly specify for an absence of any sort of impedance.

The face-weight of the carpet is also an issue in the carpet selection. The greater the face-weight, the greater the sound absorption. This means that absorption increases with pile height. The density of the weave, can also increase the absorption. Although costs goes up with an increase in the face-weight, it should be recognized that the wearing qualities of the carpet also increases. Porous padding also improves significantly, the absorption. (fig. 4.7).

Draperies made of porous fabrics can be effective noise reducers. The heavier the drapnery, the greater the sound absorption. Also greater percentage fullness increase the sound absorption. Percentage fullness is the percentage by which the width of the fabric exceeds the width of the finished drappery, i.e 100% fullness indicates that the width of the material is twice the width of the finished drappery (fig. 4.8). Absorption is also greater if it is spaced several inches away from a wall then when hung flat against it.

Designers and architects do not often like the appearance of many commercially available acoustical materials.

Neoprene-face coated fiber glass can be used on ceilings without a protective coating since its surface is safely distant from mechanical abuse, so there is considerably more freedom in design. An example of such design is to use wood strips accross it, spaced 3/8 - ½ inch apart so as to expose a fraction of the fiber glass board to the room below, fig. 4.9

When a ceiling is very high, acoustical materials affixed to it or attatched with strick clips may still not reduce the noise level sufficiently. The cause is the way in which sound waves behave. When the ceiling is high and the side walls are hard; the sound bounces back and forth between the walls, with little of it absorbed by the ceiling treatment. In rooms with this kind of structure, it is necessary to mount acoustical treatment on the side walls as well. One type of material that is useful in combination with carpeting in wall treatment is fabricated of wood fibers and cement (e.g Tectum), because it has considerable mechanical strength and will give the carpet support on the wall if it is subject to impact.

Air-Conditioning Noise Control:

In the design of television studios, mechanical specifications do include a maximum permissible noise level. The specifications ensures that the noise from the mechnical system, and the noise generated from the grille, are both reduced to an acceptable level. Where the system is already in place the angle of the louvers which control the angle at which air leaves the air outlet can be altered. The smaller the angle of deflection of the airflow, the less will be the noise which is produced. Another adjustment at, or near, the air outlet can affect the amount of air which flows through the outlet, by changing the position of the damper which control this flow. Noise is produced as the airflows past the damper, and is least when the damper is in the open position - the position which permits the maximum amount of air to flow through the outlet grille. As the damper is positioned to decrease the airflow, the noise level increases; so the trick is to adjust the control so as to reduce noise to a minimum without producing objectionable drafts.

TV Studios:

In the preceding passages an attempt has been made to explore the problems, ways and means of general and in some cases tv acoustical requirements, which would in-turn ensure soundness in broadcasting, which is our own area of concern. We, have necessarily changed into general issues to ensure a clear understanding of our problems.

Most acoustical problems expected in a tv station are not much different, but are the most intensive ones. Studio volumes are generally high, necessarily due to rigorous services requirements of the studio. The specific requirements of a particular studio is a function of the type of activity of the very studio in question. For example, a studio with preoccupation in musical recordings will have variance with one for debates. In general, however, certain ideal reverberation times have been given with respect to the studio volume, fig. 4.10.

More detail issues on studio requirements will be given more specifically on the chapter on the design.

Electroacoustic Aides:

It's necessary for us to mention, even briefly, the use of and application electroacoustic aides in television studios. These are the microphones and their accessories, the speakers. Their use has become necessary in achieving optimum audibility of recorded sound at minimum efforts. They ensure among other things soundness of recording and hence transmission. Another important issue in television program production, and filming in particular, is the necessary addition of musical sources to add to the thrill or to create certain conditions necessary that filming alone cannot accomplish. For example, in comedy films most of the laughter heard is added in the studio. So also in aminations, and in fact all types of films the sound aspect is a necessary supplement to the visual aspect towards achieving the objective of the film, both necessity as in explanative fashion or essential as in making certain pictorial situations look more awesome and telling than they actually are.

It should be noted that sound sources, that are to be inserted into a program, should match the quality of that program's sound, so that the desired uniformity is maintained and viewers remain outwitted. For example, when a video tape from, say, telecine is inserted into a live studio production, a variance in either level or character or both is easily detectable by the viewer.

Audio Quality:

Audio quality for sound is the apparent liveliness or otherwise deadness of the space where the sound originates. It should be born in mind that film inserts and studio recordings should match in amount of liveliness.

Studios necessarily have live and dead areas; this being due to the often large amount of set pieces of stage construction, furniture and other back and scenery sets. This should be noted during recording and it is the job of the planner to ensure that a minimum amount of such items is present at the studio at anyone time. This done either by ensuring closeby ready storage facilities and areas as-well-as

the versatility of the equipments. Construction of studio with sound-deadened walls and ceilings is also essential where it is desired that the extremely large sizes of the studios should not be detected through the observation of long periods of reverberation.

Microphones:

Modes of classification exist for all classes of microphones:-

i. By Method of Transduction:

— dynamic microphones

— ribbon or velocity microphones

— condenser microphones.

ii. Fields of Pick-up:

— cardiod microphones

— poly-directional microphones

iii. Mounts and Placements:

— stationery

— mobile.

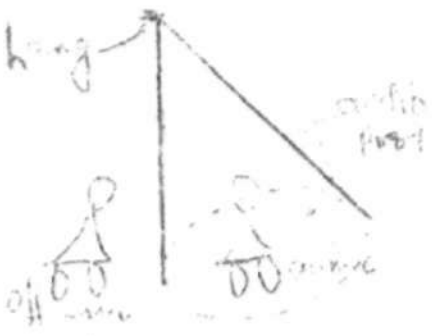
For the choice and use of many of them, its characteristics should be noted vis-a-vis the function it is required to serve. One of the issues of

consideration is also whether a visual presence of it is tolerable for the particular program. For example, in news and discussion programs microphones are left in the fields of view of performers whereas they are not in dramas. The ease of erection and speed of assembling is also important, for instance in a live production of many scenes and stages. (see fig. 4.11).

Stationery microphones include stand, desk and hanging and are used for announcers, narrators and some off-screen actors.

Another important consideration in the placement and use of electro-acoustic aides is the necessary prevention of feedback. This should be well-noted in the placement of speakers, such that sound out-put from speaker is not re-directed for amplification.

i. hanging microphone





ii. non-directional

iii. Uni-directional



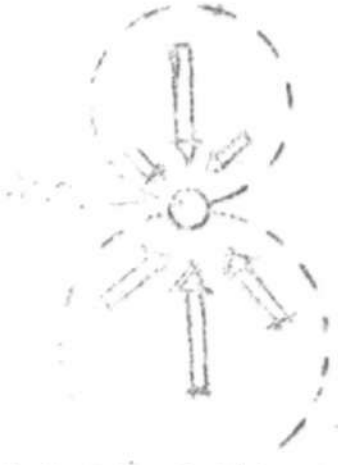


fig. 4.11: Some microphones' field of pick-up.

LIGHTING

Lighting of a television station has two functions. First to make camera operation and shooting possible and hence an impending necessary requirement. Second it makes pictorial composition interesting and pleasurable to the viewer. All cameras that are avilable for filming have a certain minimum level of light for functionning. The light level within a studio during any program shooting is therefore very high, sometimes as high as 50 kw per square foot of studio floor area. It should also be noted that lighting level and amount needed for studio operation is not the same as that used during routine maintenance and cleaning periods.

We have already talked about basic camera operation and shooting processes. We should understand how lighting level helps in camera operations in helping the determination of, for instance, picture depth as perceived by the television viewer. Although television is generally regarded as a means of producing moving pictures, well over 90% of the programs tend to consist of what are in effect still pictures, with perhaps only minor parts of the subject in motion.

A picture whether still or moving must have some order in its layout if it is to please the viewer and leave him unaware of the limitations of the television medium. To achieve a variation in perspective it is necessary to move the camera towards or away from the subject, and it is in this respect that the zoom lens (already discussed) fails. A change of image size is achieved without a corresponding variation in composition, and the viewer tends to get a feeling of unreality.

It is not always realized that vision mixing is an essential part of production technique and the method, timing and rate of cutting play a very significant role. This has been discussed on the section on production techniques. As has been seen change in picture content as-well-as method of camera selection can be used to influence viewer reaction. Lighting control in studio needs a mixture of artistic appreciation as-well-as technical understanding because lighting effects must be visually interesting as-well-as technically acceptable. Light properties and limitations imposed by the television camera should be duely understood and considered.

The lighting supervisor shares responsibility with the vision mixer for tonal quality of produced picture.

Types of Light:

For our purposes light can be classified into two types:- (i) Hard light and (ii) Soft light.

Hard light produces sharp shadows, due to high frequency composition. It is used to bring out details of textures, spots, etc.

Soft light has the tendency to soften and bring out objects in a more pleasurable, but in a less detailed manner. It is used for this and of of course in the desire to maintain a base light level.

The base light is the minimum workable level of light needed for basic transmission requirements in the studio. As already pointed out this depends on the type of camera in use.

Other groups and terms used for studio lighting include diffused lighting and directional lighting. The name is an indication of their directivity and area required for illumination.

Some of them can be hand-held lamps. They are generally used to enhance lighting amount and quality within a studio when base light level changes within a program or some particular type of illumination is desired.

In terms of positioning, method of mounting and frequency of usage, some basic categories of lighting fittings are used. These are key light, back light and fill light. These are always desired for most types of programmes and cameras.

Key light: Is the principal source of base light. It is placed from above, at least 45^{0} from horizontal and also 45^{0} left or right of camera. It is generally a hard light with high illuminative capacity and intensity.

Back light: Is an antithesis of the key light and as the name indicates it is mounted from the back of subject. The angle should be as low as possible, but care should be taken so as not to cause flare in the camera from the front. It is a soft light and is often left out in some programs, where back-set illumination and separation is not an issue. In amount of intensity is should approximately match the strength of key light.

Fill light: Can be mounted from sides alongside key light or less often back light. It can be from hand-held lamps and is a soft light. As the name indicates it performs a filling role either for base and amount or some characteristic requirement. It is approximately half the strength of key light.

Other forms of supplementary lighting types in special purposes and requirements are:-

i. Kicker light: Spot light placed at back or side usually at low angle; and performs functions of a fill light;

ii. Eye-catch: Small spots mounted on cameras; to to reflect from performers eye, giving it a pleasurable sparkle from the viewer's stand point;

iii. Side light: It is placed opposite key light; and its purpose is simply an addition in amount of illumination.

It is possible to conclude even from the above that lighting requirement for studios is enormous and delicate. Sometimes it can reach the level of 50 kw per square foot of studio floor area. This is further complicated by the relatively high base level requirements of; by now predominant, colour

cameras. For an 8000 sq. ft. studio lighting level might be in excess of 200 kw.

Some base light levels for normal operations of camera have been given below:-

	Camera type	Amount (in foot candles)
i.	Plumbicon monochrome camera	80 - 100
ii.	Image-Orthicon	80 - 100
iii.	Vidicon	200 - 250
iv.	Colour	250 - 500

Camera Operation and Lighting Level:

It has already been pointed out lighting technique is governed by both camera-tube type and production requirements. The two characteristics of the camera tube that have the greatest influence are sensitivity and acceptable contrast ratio. The sensitivity or response to light intensity determines the average incident lighting level required. Each camera has its own requirement. The acceptable contrast ratio (ACR) is the ratio between the lowest and the highest level of illumination that the camera tube will accept and reproduce satisfactorily. The range of contrast in a scene will depend on the colour

and texture of the materials included in it as well as on the lighting. A scene depicting a figure in a light-coloured dress against a dark background presents a high contrast ratio, but a scene providing contrast to the eye by virtue of differing colours may have little contrast in monochrome television. Thus a light-yellow and a light-blue area will tend to produce a similar tone of say light-grey if they have the same effective brightness. Two such areas can be produced monochrome contrast by lighting each to a different level of intensity.

Another factor contributing directly to contrast ratio is set design and decor within the studio. The set designer has to co-operate with the lighting supervisor to ensure that the range of tones in the subject is within the acceptable contrast ratio. Where indoor production is to be made, these are under complete control, but this is not so for outside recordings in blitzing sunlight, where an extremely high contrast ratio should be expected.

The shape and area of the studio setting and the due movement of people, objects, cameras and microphone booms and the restrictions prescribed by

them must be taken into account by the lighting supervisor. The major part of the lighting must be rigged in position before camera rehearsal begins, and further experimentation might not come-by. The lighting supervisor has at his disposal three main variables; the direction of lamps; the quality of light (whether soft or hard) and the balancing of the light intensity. These he controls through and by means of alteration of the categories mentioned above.

In practice each lamp may be doing two or more jobs at the same time, as those acting as key lights for some action area might be acting as back-light for some action in the other direction.

A lighting console installed in the vision control room allows the lighting supervisor to achieve quick changes of direction and intensity with one or more lamps through remote control of dimming and switching.

An additional facility enables a switching combination to be memorized and pre-set lighting combinations to be brought into operation at appropriate points in the programme.

Fig. 4.13 shows one kind of console in common use.

Lamps are suspended on ceiling barrels (with about 2 - 3 length of scaffolding) each of which can be lifted by its motorized hoist to the required height. The barrels are distributed over the whole of the studio area, in some form of grid, to ensure maximum flexibility of the lighting with the minimum of rigging. Operation of the pan, tilt, spot and flood controls on the lamps by a pole from the studio floor achieves a further saving in rigging time. Intensity controls can then be made as already described by the lighting supervisor.

There is usually a mini-control room for sole-purpose of studio lighting. Each lamp is connected to this through a lighting socket from the studio. The total number of available outlets calls for a merger along the line for 'dimmer' channels controls.

One aspect to be borne in mind in studio lighting is the presence of shadows of people, objects, etc. Some shadows are tolerable, while others are not and should be out of certain program. A common issue of concern in this regard is microphone boom shadow, tolerable in news not in dramas.

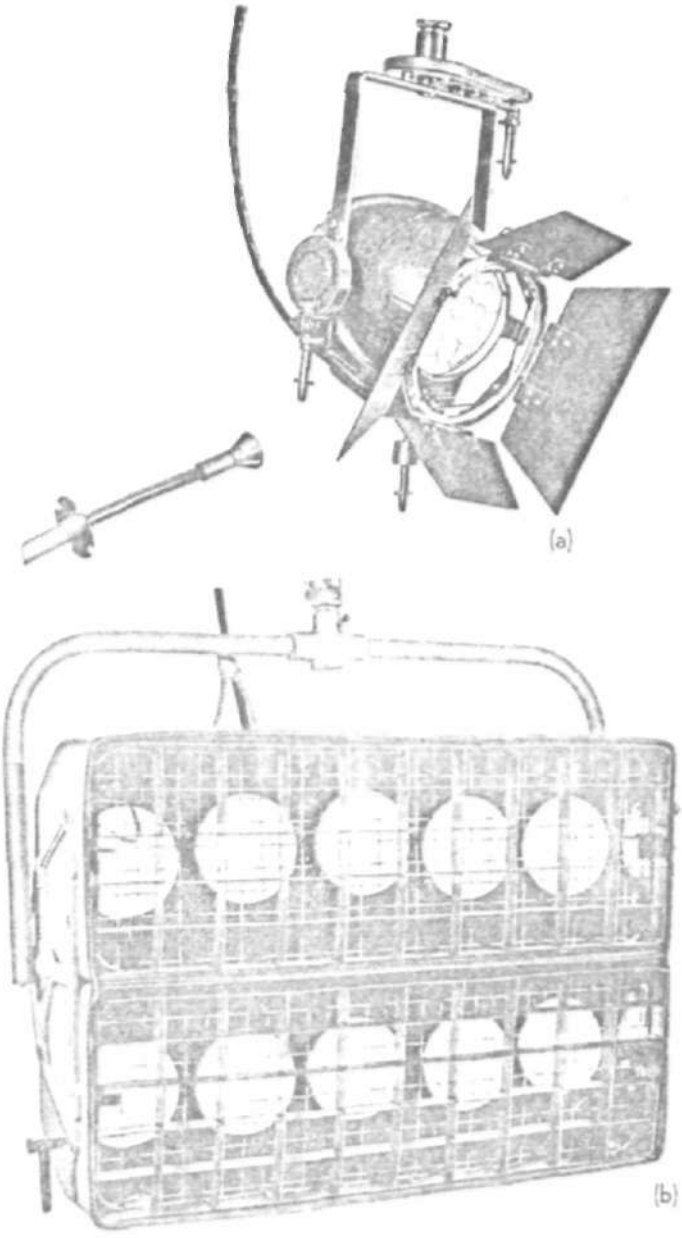


Fig. 3.12. Examples of light sources: (a) 500W PUP (b) 2kW 10 light



Fig. 3.6. The pedestal dolly

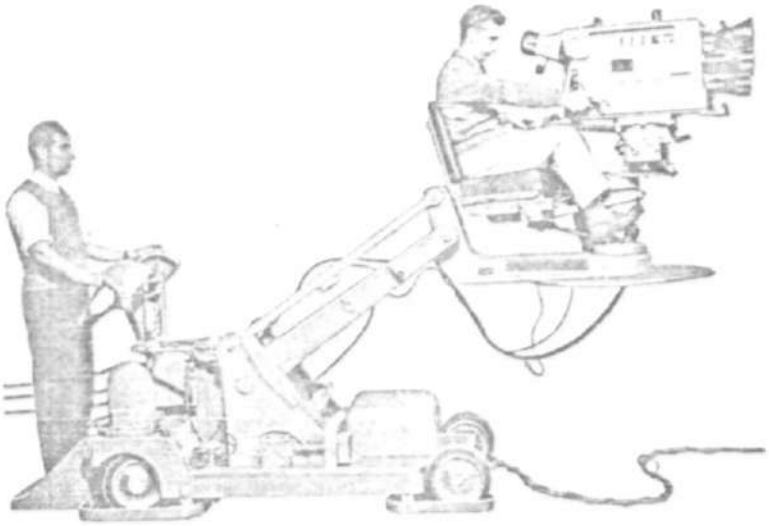
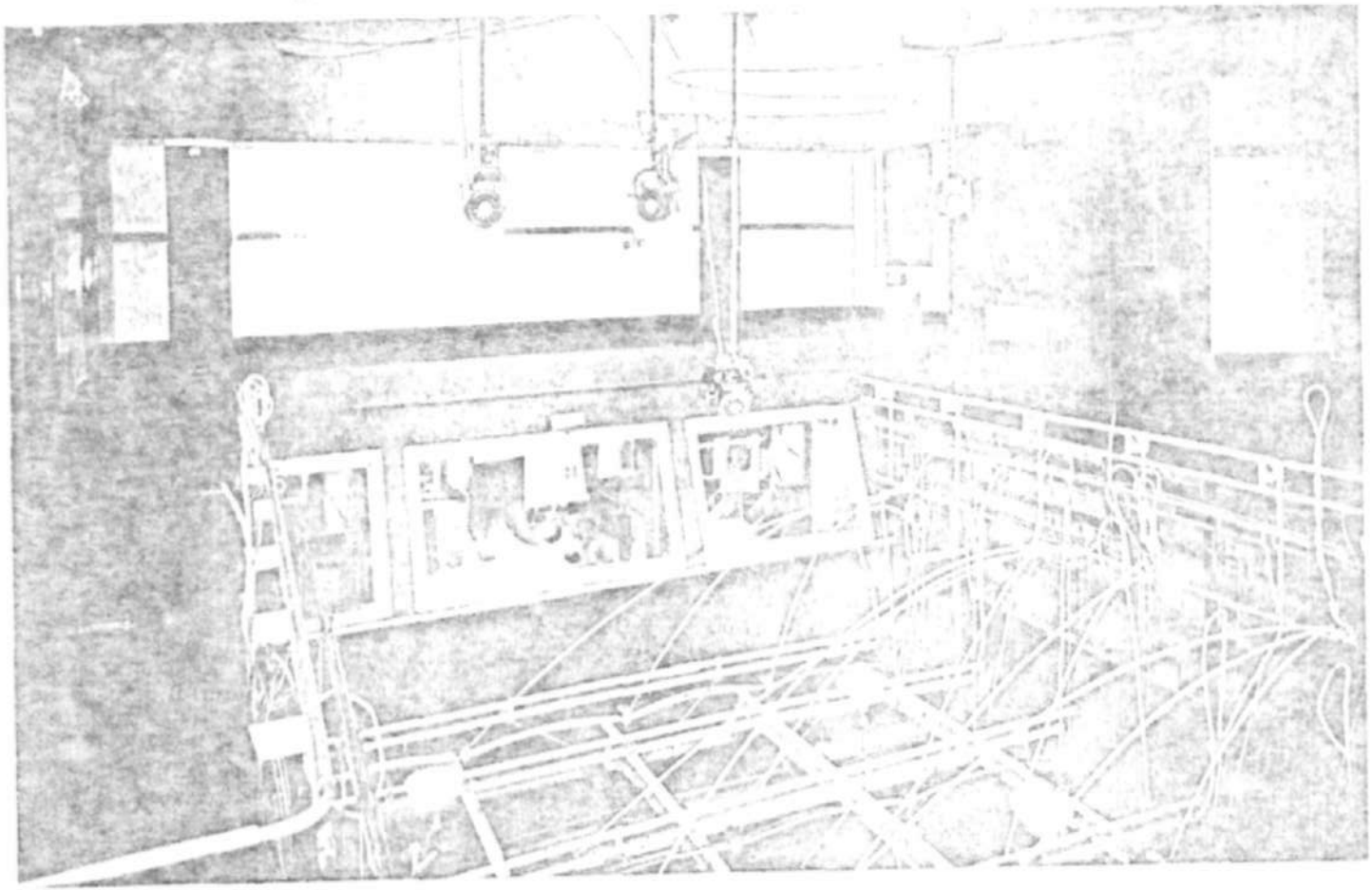


Fig. 3.7. The motorised dolly



Television Announcers' Studio



It is therefore necessary to provide the form of the only ventilation possible airconditioning, since certain studio requirements decree that the studio is not to be exposeed to outside natural ventilation and lighting.

In most television stations a central air-conditioning system is used, to make not only the studios habitable but also adjoining apparatus and control rooms shut from outside ventilation. Apart from excessive care needed to cater for the noise problem (see section on acoustics) most other instaallment requirements that apply are the normal ones for any central air conditioning plant:

i. For water-condenser types, it can be placed inside building in a central position with respect to area of coverage. For air condenser it is placed outside the main building. Depending on the availability of land and cost factor, a completely separate building might be ere erected. An alternative to outside placement is to place the condenser and evaporator on top of the building while the compressor can be at a baxement (Note negative vibrational effects likely).

ii. Where Duct system is used for distribution it should provide an attenvation at least 50 db between different rooms, and frequencies never in excess of 15 khz.

Advantages:

— Full control of comfort in air conditioning space;

— Relatively noiseless installation.

— Easy Maintenance.

— Quick attainment of comfort after on-switching.

— Capacity can be adjusted according to prevailing external conditions.

Disadvantages:

— Large space consumption of duct system.

— Hight costs.

— High quality duct required, of specialist made.

— Where ducts are lined with acoustic absorbers, removal might prove difficult.

iii. Use of cooling supply medium (water) with fan-coil-filter units in each air conditionning space.

Advantages:

— Less cost of installation than that of cooling air system.

— Erection and fitting of cooling water supply system is easy and economical.

— Easy operational control.

Disadvantages:

— Maintenance might prove troublesome (leakage of pipes, spoiling of fans, etc).

— No control of humidity.

— Required lowering of temperature is not achieved with sufficient immediacy after on-switching.

Ducts:

As we have said the right choise of duct can affect not only the efficiency of the cooling system but also the control of noise level which is a principal area of concern. The ducts system in current use are of two types:-

i. The conventional low velocity system (LVS);

ii. The High velocity system (HVS).

Generally the LVS is for small and medium of air-conditionning system (up to 500m^3/min of air supply or up to 200 tons cooling system). Used mostly in theatres, cinemas, banks, musuems, etc, where silence is crucial.

HVS is applied mostly to industrial buildings, for very large systems, where distribution is centralized:-

— Space is saved due to the usage of smaller ducts.

— More flexibility in application and hence design.

— Good individual room control.

Note that the advantage of saving space is partly off-set by a higher system operating cost and also additional first costs due to necessity in sound attenvation requirements, special control devices and a more careful fabrication and installation of duct work.

Ducts can be constructed either using galvanized steel sheets or "Builders' work".

Certain general principles should be followed:-

i. Avoidance of sudden restrictions or enlargements or any arrangement that will cause an abrupt change in velocity along the line;

ii. Benchs must be kept to minimum. Where necessary they should have a centre line radius not less than 1 ½ times diameter of the bend.

iii. Where branches occur they should be taken at a gradual angle before turning.

iv. Sharp edges should be avoided as these would be the cause of noise which may travel considerably through the duct system.

Builders' Work Ducts:

It is often possible to construct ducts out of fabric.

This is known as builders' work. Where it can be done it has the following advantages:-

i. Rigidity and hence reduction of noise;

ii. Permanence;

iii. Cheapness in that space very often exist, in any case and the only requirement is to make it smooth and air-light;

iv. Reduction of heat gain and losses along the duct lines;

v. Accessibility for cleaning;

CHAPTER - 5

DRAMA STAGE FOR TV: In Search of Solution

The essence of television to the home and society is that of fullfilling the vital function of informing, educating and entertainment. Entertainment is a phenomenon, long associated with humanity and inseparable from it. In other words there is nothing mere about entertainment as it shows mankind enjoying his humanity. Unfortunately, most planners fail to take cognisance of this and entertainment and recreation are among aspects most relegated to the background. This story is not different for the case of television which is our own concern here. The essence of drama to the civility of mankind has for long been recognized by especially poets and philosophers. It is a vital form of clear and critical representation of man by man. Of course our job here is not to study the sociology of drama. Rather as the topic suggests we shall explore ways of making drama for the purpose of televiewing both feasible and interesting.

One might as well start by asking what is wrong with the present set-ups and productions of

drama for televisions that the architect can think of rectifying. Surely one might argue that the success or failure of any drama rests mostly, if not solely, on the talents, i.e the performers rather than on the architecture of the production stage. This statement though not lacking in some trace of truth does not take into account a fundamental aspect of human perception with regards to sense of place and position. To put is mildly one cannot expect the success of a play on the life of nomadic Fulanis that is shot on the box of a place that's the studio with purely mordern and deviant form of finishing and texture. To be able to appreciate the enormousity of the task of anyone thinking of the provision of some kind of ideal provision of a staging place for drama for the purpose of tele-broadcasting and viewing, one has to consider this carefully alongside the technical requirements associated with any television production, drama or otherwise.

First and foremost we need to appreciate the variance of drama. Thus the question might as well be asked: what sort of drama are we to make provision for? For instance, if it is the NTA Kaduna we are designing for, are we to make provision for the

purely House cultural program of 'Tambari', or is it the Fulani program of Jauro, or for the hetro-cultural production evident in 'Samanja', or still the purely mordern setting requirements of the law drama'case-file'? In any case we cannot provide a separate stage for all of these functions, even if not for the economy then for the non-static nature of the drama production, most of which become obsolete after some relatively protracted period. What is more the filming techniques, materials and apparatus calls for some amount of stability in terms of both form and place.

To further understand our mission it is necessary for us to have a full understanding of drama and stage or theatre requirements. We shall peep of only briefly into this aspects in their physical and abstract terms. Someone has described the theatre as "the place where a nation thinks in public in front of itself".

Its quite evident that there's a symbolic relationship betwwen the performing arts and the society. Jibola Dedenoola writing in the September, 1983 issue of the Television Journal says: "The expectations and responses of an audience to a

performance of one of this so-called performing arts do not exist in a vacuum social volumes play a significant role in our experience of a performance. Indeed, because the performing arts are public arts, they are inextricably linked to the world in which they exist. They mirror and reflect the society. They mirror not only one individual natures, but also the nature of our world ".....". The aim of the brief inlook into the philosophy of the theatre is to enable us have a free hand to initiate it only from some definite background; not just with some few precedences and dogmas in mind. Now the question of what is a theatre may be asked? The English dictionary simply defined it as building or arena (open air theatre) for the performance of plays, for dramatic spectacles, etc. Still another definition may be a hall or room with seats in rows one behind another for lecturers, demonstrations, etc. Yet another one of interest to us is given as dramatic literature of art; the writing and acting of plays, especially when connected with one author, country period, etc

Certainly it's quite evident that there's little that has not been attended to in any issue

that has to do with the theatre. Also remarkable variety exist world-wide about different kinds of theatres. It's also not disputable that the particular type of stage to be choosen depends very much on the kind of plays expected to be handled by the stage. Yet it should be appreciated that the challenge posed to traditional theatre is enormous. First the extent to which to purposeful nature of theatrical art be carried. That is how far can and should the theatre go in the direction of having an immediate effect on human behaviour? The second is how best the first can be accomplished? Wherever this question is considered, it's quickly concluded that the proscenium theatre aesthetics is far too wild an artistic fool to get, the desirable result. Sean Kenny writing in his book 'Actor and Architect' says "We haven't designed a place where theatre can begin from a white canvas, from a negative expression..... It must begin from a nothing beginning". Talking about theatre he continues "It doesn't begin with the architect. It doesn't begin with the frame. It begins as a space, - *free space; nothing* ..... It begins from the inside and groves in an organic way like a tree;

like anything exciting, ... by that design is the whole design controlled, from the inside.

The preceeding paragraphs do seek to expose us adequately for an understanding of the task associated with the provision of any stage or theatre. Our topic here - drama stage for television - suggests that we try to come up with a stage or a theatre set-up in a manner that best suits television filming requirements. We have looked at the sociological and even philosophical portions of the theatre. This is necessarily so because the latter is inseparable from drama which is our own area of concern here. However, it's worth mentioning that drama alone is known to have some limitations if it alone is considered rather than all theatrical performances: music, dance, poetry, art, etc. In spite of the known limitations, drama will appear to offer the greatest possibilities of all performing arts, for achieving interaction within society and the arts. Whether society is directly affected by drama to initiate a process of change or not, drama or the theatre generally encourages changes by enabling us to perceive, appreciate and accept the changes taking place within society or at least the need for certain changes.

Either through satire, lampoons, or providing the vices, follies, ills, abuses or malaise of society are held up to scorn, derision or ridicule, thus providing some form of guidance to the society path's greatness and accomplishment. Drama or theatre can therefore be a potent force not only in changing society but in fact in building a nation. This is seen in the case example of the Jews usage of their National theatre to weld the disperate nationalies who converged in Israel together to form their own state. In realization of this importance of the performing arts, travelling theatres are now very much of a commonplace in the country, such as the Baba Magbe-Sule and Jaguar, etc. This development has provided for Nigerians, an initiating ground for the seeds of an entertainment industry to sprout and germinate.

Let us now turn our attention to the provision of a drama stage for the purpose of television. The needs and significance of which have already been exhaustively discussed.

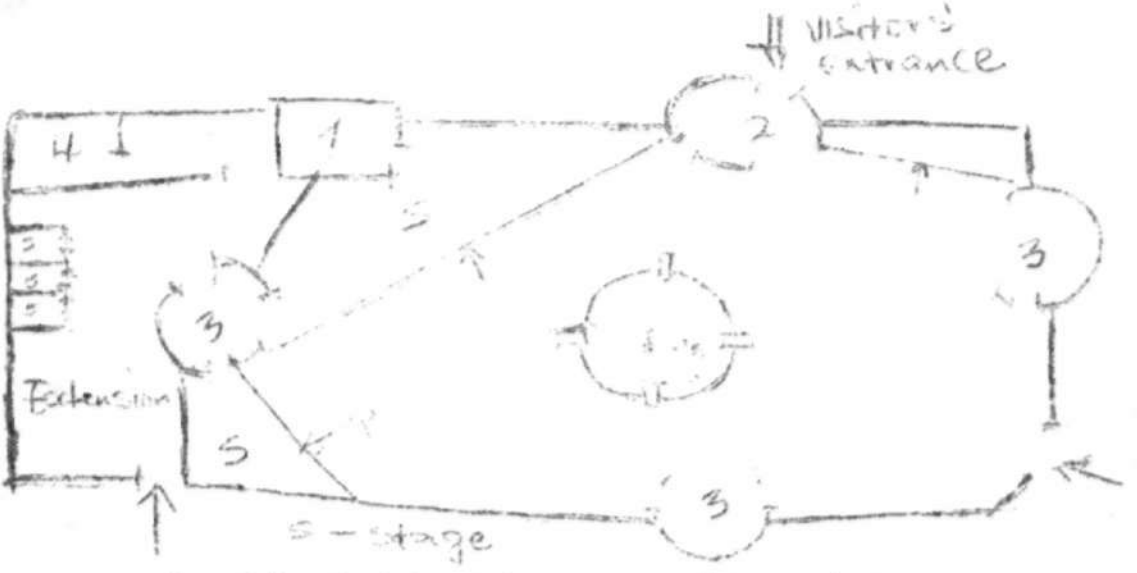


Fig. 5.2: Sketch of the Drama Village at A.B.U.

1 — costumes + rehearsal

2 — scenery + backset stage

3 — costumes + furniture; performances

4 — cleaner's room

5 — toilet facilities.

Fig. 5.2 shows the existing drama village at A.B.U. It represents a living example of a theatrical stage built and blended alongside the predominant culture's traditional form. Building materials is typically Hausa: mud, grass and thatch roofs supported by guinea corn stalks. Both Hausa and Fulani cottage set-ups have been sufficiently represented and the building will be mistaken (?) For one of such from its exterior. No mordernity has been introduced in the finishing of interior walls. The paintings and the etchings represent the said culture adequately.

In the design of our drama stage we shall also seek to represent the cultures of the Hausa, Fulani, and the mordern trends as well as a possible congolomeration of two or more of the above. One important aspect in the considerations for space requirements is the provision of shooting space requirements. Consideration is given to camera space for movement, dollying, as well as certain minimum distance requirement for zooming, focusing, etc. Also it's the intentio to make the drama profit-oriented. Therefore consideration is given to the presence of audience and their requirement. This is expected to be a source of revenue to the station. Other considerations as stage lighting and acoustics do apply as much here as for other theatres, if not more due to the shooting and recording requirements. Apart from revenue generation, the presence of a live audience is expected to add natural livelihood to the drama production. Also it's an important opportunity for the members of the public to interact and dialogue with their artists that feature on their screens at home. This will open an avenue for constructive criticism and hence a quality appraisal of the drama production.

Given all these one might question the essence of having an additional studio for drama. This is because not all drama types are expected to be handled by the drama village. Certain dramatic types can be conveniently handled by the studio provision and the extra burden of the transfer of cameras, dollies, microphones, etc to the drama village will prove unnecessary. Where provision for the drama, is only a couple of office spaces, requiring no alien architecture, finishings, etc to the studio, for example, this is done in the studio with sufficient credibility. Also certain dance dramas require not more than one or two types of back-settings and this is possible in the studio.

On account of the commonness and importance of dramatic shows on peasantry farming, provision is also made for such space around the drama village. The common crop types of this area are represented in the spaces. This is also in line with the campaign for a return to the farm. Although any shooting in this area is expected to be performed by hand-held portable video-tape cameras, provision has been made for camera-dollying tracks, should quality or other requirements demand the full usage of large tv cameras and dollies.

CHAPTER - 6

The chapter on the design will accomodate the following:-

i. Siting;

ii. Design Criteria;

iii. The Climate;

iv. The brief, and

v. Design report.

Siting:

Siting criteria for any television station will include the following:-

i. Line-of-Sight Distances: As earlier explained television transmission requirements (see chapter 2) stipulate the absence of any physical obstacles at or adjoining the site, that falls within the probable line of passage of the television signals. Where the transmitter facilities are located on the site, necessary extra cost of antenna heights is reduced by ensuring a site of a plain area if not on a hilly one. The latter case though enhancing capability might likely pose logistic problems of installation, maintenance and co-ordination.

With this in mind the site choosen is a gently sloping plain, practically flat and is not surrounded by any hilly area or any other tall natural or artificial structure.

ii. Environmental Factors: Environmental factors, particularly noise pollutions should well be avoided. Site should for no reason be along intensive noise subjectible areas, like airports, airpaths or some other high noise producing industries, to avoid necessary costs of sound attenvation provision at studio walls, or subject whole building to gradual sturctural failure and consequent disintegration.

Site choosen should also have abundance of natural lighting, which is generally not a problem in this region.

iii. Acessibility to public: Consideration for this would depend on the particular type of the station. For an averagely audience-involving station like ours consideration need be given not only to staff access, who at times have to work late at night, but also to members of the general public, who will

include certain talents and performers. This is moreso due to the provision of a drama village which is expected to enjoy patronage of members of the public, periodically.

iv. Land Cost And Zoning Character: The choosen site at a low density area at the outskirts of the city, amidsts peasant farm settlements is expected to be relatively cheap. Ample provision for possible future expansion also exist.

Another issue considered during siting is the presence of adjoining river back and a forest belt. This would be exploited to add life to the whole station and make provision for some kind of outdoor shooting of both stills and motion picture in a suggestively cool natural envirnment. Also considered favourable is the acceptable distance to public facilities, telephone, electricity and water supply.

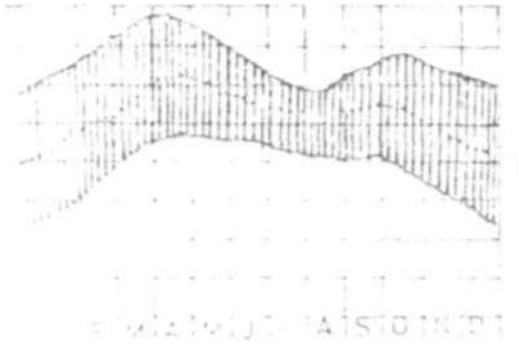
The Climate:

The climatic condition is an impending necessary consideration as it would determine among other things, type of building materials to be used, nature of substructure, etc.

CLIMATIC VARIABLES

..... monthly mean
mean daily
min - max

MEAN WIND DIRECTION



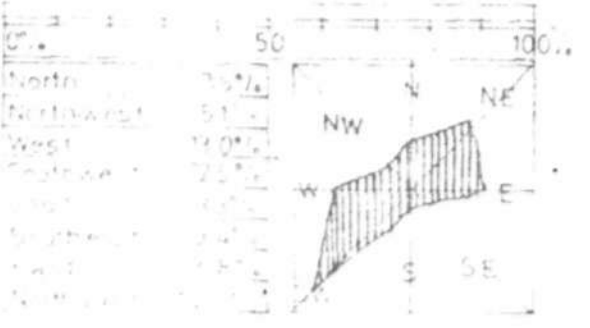






TABLE 6.7

The climate of Kano conforms to that of the sahel Savanna of the region, with very remarkable variance in all aspects of rainfall, wind direction, temperature and relative humidity, both within and between successive seasonal periods. Table 6.7 shows us the respective nature and magnitude of the four climatic variables. Rainfall is given side-by-side with evaporation and the dryness of the region can be appreciated when it is considered that the amount of evaporation for all, but the month of August exceeds that of rainfall. This leads to a natural vegetation cover of deciduous and often thorny trees, that can tolerate the low moisture level of the soil.

Temperature variations within the same day can reach the level of 15^{oc}, with more variation evidenced around the dry months of January to April. Generally artificial colling might be necessary in confined spaces for most parts of the year. Otherwise provision of adequate shading for windows is necessary, this done in such a manner as does not conflict with the requirements for air movement which is supreme.

Perhaphs the most striking wind is the harmattan, a north-easterly experienced from the months of November and December to February or March. It brings with it the most unwelcomed situation of a combination of dust and dryness, causing from slight irritations to serious

discomfort. During the rainy season, however, the south-westerlies predominate and the temperature condition is remarkably varied.

Generally, the climatic condition represents a case of both moderation and adversity, this being with any of all its aspects of rainfall, temperature, humidity and wind direction.

Design Criteria:

Our design criteria is of utmost importance to us, and arriving at it represents no easy task and process. Generally, to arrive at our criteria the following factors were taken into account:-

i. The needs and wants of the CTV as from first hand in formation got from them;

ii. The technical requirements and needs of any television station especially one of our make and type;

iii. Pools of mistakes, experiences and short comings as realized basically from case studies of existing television stations;

iv. The organizational, structural and administrative set-up of the CTV;

v. Other requirements peculiar to the CTV, environmental factors as-well-as the social and cultural backaround of the people;

vi. Structural requirements and considerations;

vii. äesthetic'' and architectural value.

Although it is true that most parts of this piece of work is in one way or the other dealing with criteria for design, certain specific items might still be sited here:-

(a) Inadequate studio sizes and number;

(b) Lack of studio vaviance: Variance here refers to the allocation and design of specific studio for same specific function. Studios are often not designed with some specific function in mind. This makes accounts of any micro-issues such as determinations of ideal reverberation times and considerations for some useless, as different functions have different such requirements;

(c) Provision for expansion of the studio and office space, as-well-as the CTA;

(d) Lighting: Proper lighting is indispensable for any television station both for purooses of function and fashion. Natural light should as much as possible be made use of.

Where it is not used due considerations must be given to the negative bye-effects of excessive heating - how to eliminate or subsidize;

(d) Other design conditions and criteria not peculiar to television stations also exist:- climatic considerations, cost, sound functional relationship and zoning requirements both structural and administrative.

The Brief:

From all the forementioned criteria the following area requirements and allocations were concluded:-

(a) Ground Floor

i. Studios:

Studio A	- Drama studio	600 m^2
Studio B	- Audience/variety	280 m^2
Studio C	- Music/Amination	180 m^2
Studio D	- Talks	120 m^2
Studio E	- News	100 m^2

ii. Central Technical Area (CTA):

Master control room	66 m^2
Telecine room	90 m^2
Advanced Maintenance room	15 m^2
Technical Quality check	15 m^2
Central apparatus room	30 m^2

Vide

Video tape recording (VTR)	24 m^2
Transmitter facilities	90 m^2
Outdoor area for supprt facilites, generator fuel clamp	120 m^2
Crew lounge	20 m^2
2 No studio control rooms	20 m^2
2 No sound control rooms	8 m^2
2 No camera switch rooms	6 m^2

iii. Support Facilities:

Artists' lounge	54 m^2
Kiosk	18 m^2
Wos	72 m^2
Audience waiting room	54 m^2
Vip waiting lounge	24 m^2
Office space	40 m^2
Hair dressers' room	28 m^2
Communal dressing room	18 m^2
2 No dressing rooms	24 m^2
Costumes room	42 m^2
Rehearsal Hall	160 m^2

iv. General Stores:

Central props storage	200 m^2
Props reception	90 m^2
Furniture and back-set storage	100 m^2
Processing courtyard	180 m^2
Painting room	80 m^2
'Near' props storage	18 m^2
Electrical and electronic stores	110 m^2
Mechanical storages	110 m^2
Furniture storage	60 m^2
Cleaners' storage room	56 m^2

v. Workships:

Electrical	60 m^2
Mechanical/vehicle	110 m^2
Building Maintenance	56 m^2

vi. Film Department:

Film storage/library	50 m^2
Film processing	10 m^2
Librarian's room	10 m^2
Editing and Review	50 m^2

vii. Staff Offices:

(a) Engineering Division:

Principal Techical Officer (links)	28 m^2
Principal Technical Officer (transmitter)	28 m^2
Principal Engineer (transmitter/ links)	28 m^2
Senior Engineer (transmitter/ links)	28 m^2
Assistant Chief Technical Officer (CAA)	28 m^2
Principal Engineer (CAA)	28 m^2
Principal Technical Officer (Engineering Operations)	28 m^2
Engineers	28 m^2
Higher Technical Officers	42 m^2
Senior Engineer	42 m^2
Director of OE	42 m^2
Wcs	

1st Floor Engineering (continued)

Secretary to Chief Engineer	28 m^2
Chief Engineer	56 m^2
3 No Studio Control Room	30 m^2
3 No sound controls	12 m^2
2 No Camera switches	6 m^2

1st Floor Engineering (continued)

Music originating room	60 m^2
Crew lounge	36 m^2
Central air-conditioning room	180 m^2
Echo chamber	60 m^2

News and current Affairs Division

Manager: News and current Affairs Division	56 m^2
Controller of News	28 m^2
Principal News editor	28 m^2
Senior News Editor	28 m^2
Editors (News)	28 m^2
Editors current Affairs	28 m^2
Senior Editor Current Affairs	28 m^2
Principal Editor Current Affairs	28 m^2
Principal translator	28 m^2
Translators	28 m^2
Sports Editor	42 m^2
Typists' Room	42 m^2
Wcs	42 m^2
Reporters room	77 m^2

Programs Division:

Manager: Programs Division	42 m^2
Controller of production services	28 m^2
Principal production officer	28 m^2
Senior Director	28 m^2
Directors	28 m^2
Production Assistants	42 m^2
Director of Research (Research & Documentation)	28 m^2
Researchers " "	28 m^2
Research Assistants	28 m^2
Vacant	28 m^2

Third Floor (Programs continued)

Principal producer (light Entertainment & Drama)	28 m^2
Senior Producer " "	28 m^2
Producers " "	28 m^2

Film Production Unit:

Film production officer (Film making)	28 m^2
Film production officer (processing)	28 m^2
Film production officer (Editing)	28 m^2

Film production Unit (continued)

Principal producer	28 m^2
Film viewing room	42 m^2
Photographers' room	56 m^2
Presenters' room	42 m^2
Clerical Assistants	28 m^2

Commercial Division

Controller of Commercial Division	28 m^2
Senior Commercial officers	28 m^2
Commercial Assistants	28 m^2

Administrative and Finance Division:

Manager: Finance and Administrative Division	42 m^2
Controller of Administration	28 m^2
Principal Administrative Officer	42 m^2
Administrative Assistants	42 m^2
Clerical Assistants	42 m^2
Typing Room	28 m^2
Secretary to General Manager	28 m^2
General Manager	28 m^2
1 conference room	77 m^2
Controller of finance	28 m^2
Chief Accountant	28 m^2

Administrative and Finance Division (con'd)

Accounts clerks	56 m^2
Auditors	28 m^2

Others

Workers facilities:

First aid room	28 m^2
Cafeteria	66 m^2
Kitchen & scullery	18 m^2
Sculery	10 m^2
Storage	6 m^2
Workers' rest	6 m^2
Labourers'/Gardeners changing room	42 m^2
Entrance lobby	50 m^2
Waiting lounge	16 m^2
Reception	10 m^2
Radio room	42 m^2
Telephone room	42 m^2
Props officer	28 m^2
Transport officer/Drivers	28 m^2
Librarian	28 m^2
Central stores officer	28 m^2
Senior graphic artists	28 m^2
Graphic artists	28 m^2

TOTAL APPROXIMATE STAFF STRENGTH: 220

Car parking space provision (staff)	60
Cycles' park	20
Visitors' park	30
Obvans' park	4
Parking Drama Village	10

Design Report:

A talk on the design report is necessarily brief because all the preceeding is virtually a report on the consequent design, in one form or the other. Here we should highlight some of the issues and factors not mentioned before under their respective chapters.

As earlier pointed out the issue of special requirements is of special sensitivity and importance for efficient radio broadcasts. A fairly extensive talk has been given for this purpose. Bits of more specific issues are talked about here. To achieve the duely short-reverberation time it is necessary to use a wide range of extremely efficient absorbers at virtually all surfaces; floors, ceilings and walls. The use of suspended ceiling of acoustic value increase efficiency and greatly reduce the length of the reverberation time.

However, in drama or musical studios requirement might stipulate even an increase in the natural reverberation time. In this case reverberation plates in forms of thin, hard panels capable of vibration can be employed. The echo chamber is employed to be used in circumstances of need of long reberberation periods. This is true for music studios, where richness and fullness is enhanced with a higher amount of reberberation.

Apart from its functional value certain factors need to be born in mind in the choice of any acoustical treatment or finishing. This include:-

i. Mechanical strength - should withstand reasonable amount of pressure, casual or accidental;

ii. Fire resistance - should not encourage the spread of fire, and should be resistant to it;

iii. should be readily cleaned of dirt; easily repainted or otherwise refreshed from time to time;

iv. Material should not conflict with lighting provision and complicates camera operation, for instance due to reflection.

One important aspect about acoustical control within a studio is that the presence of items in the studio has effect on the acoustic atmosphere. The nature of the television station leads to occasional cramming of the studio with scenery designs, back sets, props, furniture, monitors, etc. Each of such items can either add or subtract to the length of reverberation time, depending on whether absorption or reflection predominates, with that material. Therefore where a definite setting and acoustical atmosphere is required, the minimum number of

items should be left in the studio. Partly for this reason, an attempt has been made in the design to provide storage spaces for such items as near the studios as possible, so that they can easily be shifted outwards and inwards. For smaller studios, talks and announcer's, this is much less of an issue due to the relatively less amount of items found in these studios. To minimize their natural reverberation periods, they have had their heights relatively low, since requirements for services' space are less stingent.

For the purposes of air-conditioning, the position of the central air-conditioning room is such that none or little number of corners exist along the duct lines which is a major source of noise. Another issue is the absence of louvers at the duct outlets within the studio. The positioning and isolation of the central air-conditioning room takes into account the high amount of noise output and considerable vibrational effects likely to emanate from this area. For this reason it does not share a common wall, with any other function. Sound structure in flooring is necessary to ensure enough attenuation with the underneath floor and areas.

Most other services and support facilities for the studio are located with proximity to the areas they

serve as the main issue. Another, however, for purposes of scenery and stage construction workshops is the need to hide this region of activity as away as possible from the sight of others. For purposes of location of staff offices a major issue is proper co-ordination and supervision of staff. Another is proximity to the studios and the CTA. For the latter reason offices spaces for supervisory staff have been provided adjoining the CTA, rather that at the main offices block. Yet another reason for concern is the accessibility of the staff to outside members of the general public who need not be entertined in the CTA region, and are best served by the opportunity of a quick enough access to their areas of concern.

The design of the drama village posed a special challenge, primarily because of the shooting needs it has to serve. There's also the chance of it proving as monotonous as the tv studio. However, what was achieved is a necessary compromise, giving the limitations of what can be set-up for this purpose. Its importance lies in its significance as its mere presence makes the issue of any drama production a serious and lively affair. It is also to serve as the open air studio and certain cultural dances, musicals might be convincingly shot here rather than the studio.

A general character of the design is provision for very generous circulation spaces, both within and outside the buildings. The presence of up to 3 m of corridors in the studio environment made to facilitate smooth transfer of heavy equipments; camera dollies, backsets and scenery stages, etc.

The provision of courtyards is a form of integration of the natural site features with the building. It is also supposed that certain film shooting can take place within these courtyards. They also serve as a rest place for the workers of especially within the studio, who would find it a most welcomed contrast.