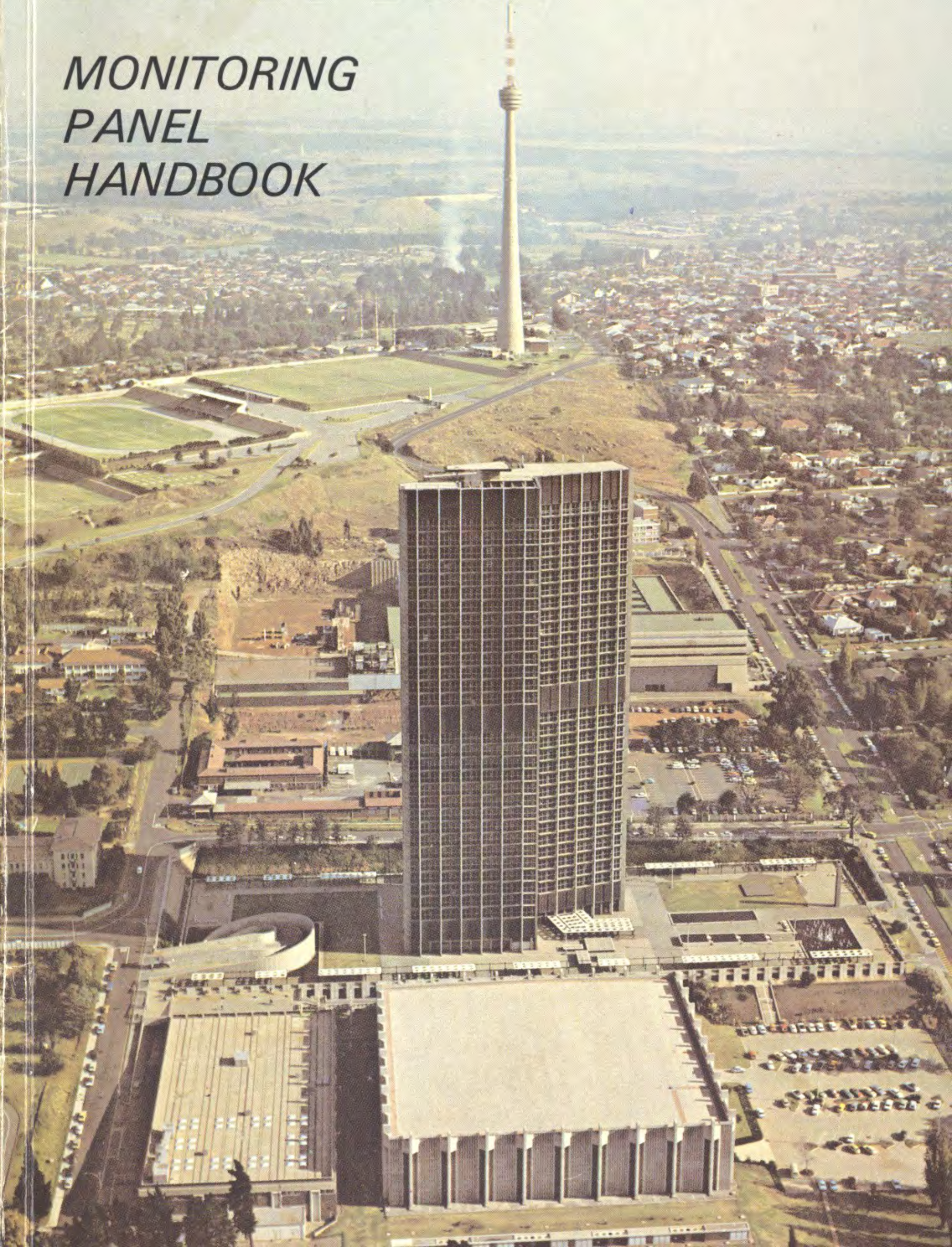
radio rsa

MONITORING PANEL HANDBOOK



RADIO RSA

MONITORING PANEL

HANDBOOK

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P.v.d.M. MARTINS

February 1980

Cover Broadcasting Centre Johannesburg.

MESSAGE FROM : THE HEAD EXTERNAL SERVICES

It is neither exaggeration nor flattery to say that members of our Monitoring Panel are indeed our most important listeners. All our efforts in Johannesburg and from our powerful shortwave transmitting station would be futile without your reception reports, comments and suggestions. Without your reception reports, we would not be sure that what we were broadcasting from South Africa, could actually be heard in the countries from where you send your reports.

The valuable information contained in your reports is analysed, processed and graphed by our frequency planning department, thus enabling our engineers to improve reception quality to our various listening areas.

All of us here at Radio RSA, are profundly grateful for the efforts of our friends in so many distant parts of the world. It is indeed a privilege for me to be able to say this heartfelt "Thank You!"

February 1980

J.T. GREYLING
Head External Services

CHAPTER 1

Introduction to Radio RSA's Monitoring Panel

Many variables are involved in international broadcasting, but probably the most harassing is that the broadcaster does not always know how well the broadcasts are received in the intended listening areas. Unlike VHF, FM and Television broadcasts, long distance shortwave broadcasting is solely dependent on the refracting ability of the upper atmosphere termed the "ionosphere" which is a belt of atmospheric gasses surrounding our planet in layers stretching from approximately 60 to 420 km above the earth's surface. The propagating ability of the ionosphere again is dependent on energy radiated from the sun and hence it follows that the time of day, the four seasons of the year and the so called 11 year sunspot cycle, all have a direct bearing on the signal strength of a long distance broadcast as received in the intended listening area.

Another annoying occurence, fortunately not too frequent, is sudden ionospheric disturbances or magnetic storms which are caused by excessive outbursts of energy from the sun. These disturbances can blot reception out completely, but no doubt the most annoying of all is interference caused by a station using the same or almost the same frequency as that of the broadcaster. Interference can either cause a whistle, hum or hiss which makes listening unpleasant and more often than not, impairs reception to the extent that the programme can no longer be intelligibly followed by the listener. If an international broadcaster was to continue broadcasting under such conditions, or if an incorrect frequency which will not give the desired signal strength is used, listeners will lose interest, no matter how much the programme material is favoured. It is thus obvious that all broadcasting stations must have a system of knowing how well their broadcasts are being received.

If there is no feedback in the form of reception reports in one of the many SINPO reporting codes, or descriptive letters giving reception details, the station will not know if its programmes are being received favourably. Naturally, there are a number of ways in which such information may be obtained.

Firstly, the broadcasting station could rely solely on reception reports received from international monitoring stations such as the BBC's Caversham Park. There are some broadcasting stations who maintain monitoring stations for this purpose. Reception information in the SINPO code and information concerning channel availability is exchanged between such stations. These stations however, use sophisticated receiving equipment and chances are that these stations may experience better reception than the average listener. Moreover, the number of monitoring stations is limited. It should thus be obvious that it would not be wise for broadcasting stations to rely entirely on reception reports received from international monitoring stations.

Secondly, the broadcasting station may have receivers installed in all of its country's embassies in foreign countries. Reception reports obtained in this manner, however, could be costly and the reports will be limited to the city or cities in which the country has embassies.

Thirdly, the broadcasting station could employ a monitor in each of its listening areas who is in one way or another, reimbursed for his monitoring efforts. This may seem a very good and economical way of obtaining reception reports, but here too, the reception reports are limited to the location of the employed monitors. This does not provide the station with an overall picture of reception conditions in the station's target area. Furthermore, it is not always good policy to rely on one or two paid monitors in a particular target area. If false readings were obtained due to human error, or malfunction of receiving equipment, the broadcasting station would have no means of cross checking and it may be necessary to send a representative to the particular target area, to verify reception conditions, which could be costly.

Finally, the station could, as we do here at Radio RSA, rely on its listeners to report on reception conditions. Let's be honest, who better is there than the station's own listeners and Dxer friends to report on reception. After all, the programmes are designed and intended for you, the listener and Dxer, so it is only natural that your reports should be the most valuable.

Realising that the best source of information would be that from our own listeners, it was decided shortly after the inception of Radio RSA, to send invitations to listening enthusiasts throughout the world. The response was so overwhelming that soon a panel of monitors was formed and this is how the monitoring panel came into being.

Radio RSA's monitoring panel operates on an entirely voluntary basis. The only condition of membership is that each monitor must submit at least one reception report per month on transmissions beamed to his or her particular residential area: The monitoring panel consists of about 500 select monitors scattered in all of Radio RSA's target areas. All monitors have a thorough knowledge of the SIFO code which stems from the more complex internationally recognised SINPFEMO code which is used for compiling and submitting reception reports to broadcast stations.

Panel members submit their reception reports to Radio RSA's frequency planning department, usually referred to as Monitoring Panel Headquarters – MPHQ.

Being a club, members naturally would like to know more about the activities of other members and hence a newsletter is issued approximately every two months. The newsletter usually includes information of interest to the more enthusiastic shortwave listener as well as news of developments on the engineering side of the South African Broadcasting Corporation – not only the external service, but also of the various domestic services. Moreover, the monitoring panel, from time to time, issues technical brochures to all its members, free of charge. A report of reception conditions as compiled from reception reports submitted by various monitors in the respective listening areas, is issued with each newsletter. Special report forms which are used by monitors for compiling these reception reports are also issued with each newsletter. Twice yearly, monitors receive international reply coupons in settlement of postal expenditure paid on their part. After six months of regular monitoring, a diploma is issued and for every successive year of regular monitoring a monitoring stamp is issued to the respective monitoring panel members. Unfortunately, membership has to be limited for obvious reasons, and subsequently there is a large waiting list of listeners wanting to join.

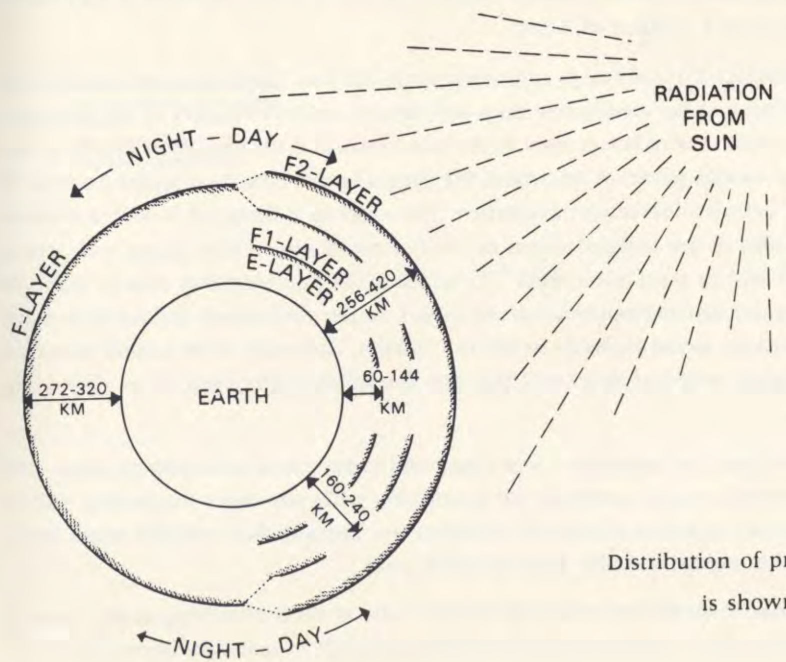
The monitoring panel fulfils the very important task of informing Radio RSA's engineers of reception conditions; recommendations for clear frequency channels are also received regularly. All reception reports are statistically analysed by the frequency planning department at MPHQ and any subsequent amendment or amenaments deemed necessary to our Radio RSA frequency schedule are effected in an endeavour to provide optimum reception quality throughout the transmission schedule. Not only have we formed a panel of reception reporters, but we have established a circle of friends in all parts of the world and from all walks of life. People of varied interests, but with one common aim – that of keeping Radio RSA's broadcasts loud and clear.

CHAPTER 2

The Mechanics of Shortwave Radio

To fully understand the mechanics of shortwave broadcasting, one should have some concept of the propagation medium through which the radio signals from our transmitters have to traverse before reaching your receiver.

Long distance broadcasting on shortwave is made possible purely by virtue of the refracting ability of the ionosphere. Under favourable conditions, a radio transmission reaching the ionosphere will be bent earthward and will return to earth at a great distance from the transmitting station. The ionosphere consists of a region in the upper atmosphere where free electrons are produced by the ionizing effect of ultraviolet light and x-rays from the sun. The ionized region commences at approximately 60 km above the surface of the earth and extends to approximately 420 km. Due to radiation from the sun, primarily ultraviolet radiation, the height and density of the ionosphere does not remain constant, but varies significantly with the time of day, season of the year and the approximate eleven year cycle of sunspot activity. The ionization density of the ionosphere tends to peak at various heights above the earth due to differences in the physical properties of the atmosphere at different heights. The levels at which the electron density reach a maximum are termed layers and these are identified as D,E F1 and F2 layers in order of increasing height and ionization density. The number of layers, their heights and their ionization or electron density vary both geographically and with time.



Distribution of propagating layers is shown in FIGURE 2:1

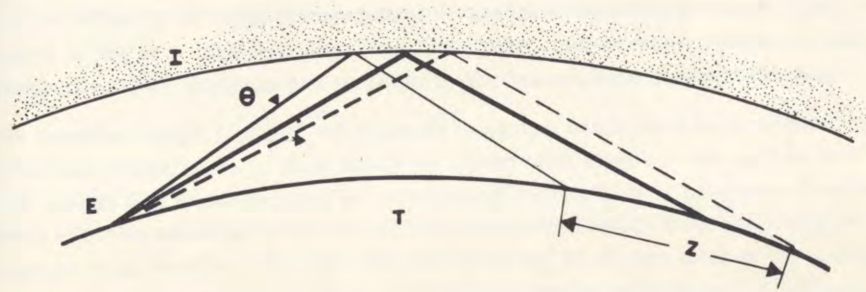
The most significant for long distance broadcasting is the F1 and F2 layers which, at night, combine to form one layer. A radiowave emanating from our Meyerton transmitting station will first enter an area of comparatively low density and eventually enter an area of greater electron density where it will meet an adverse force presenting some opposition to its travel. In this manner the wave will be turned away from its original path and providing the density of the medium and the frequency are suitable, a point will be reached where the wave will be turned from its original route and eventually will be completely turned and leave the ionosphere at an angle similar to that of entry. Due to the bending of radiowaves in the ionosphere, the phenomenon is termed refraction rather than reflection as commonly referred to.

The descending wave will reach the earth's surface at some distance from the transmitting station leaving a skip distance between the transmitting station and point of reception – Ref. Fig. 2.2. Within this distance the only signals that can be received are those due to the direct wave travelling along the earth's surface. There will thus be an area of no reception – usually referred to as the silent zone, as the groundwave from the transmitting station is restricted to relatively short distances as compared to the skywave. When the descending wave strikes the surface of the earth it is reflected with an angle of reflection equal to the angle of incidence, the reflective ability depending upon the texture of the particular area of the earth's surface. Seawater for instance, is a good reflector, followed by pastoral land, while desert areas may be regarded as poor, the reflecting ability being determined by different conductivity values. The wave will thus travel up again to the ionosphere, be refracted again and return to earth still further away, giving rise to another zone of silence. In this manner, radiowaves may travel over large distances in a number of hops.

The maximum distance for one hop is approximately 4 000 km. The distance of the first hop from the transmitter and the consecutive hops will depend on the frequency of the transmission, the angle at which the radiowave enters the ionosphere and the ionization density of the ionosphere at the various points of refraction. For long distance broadcasting the antenna is designed so as to permit a low angle of radiation. The antenna is designed in such a manner that the beam width of the radiated waves in the horizontal and vertical plane will permit reception over an area or areas as required. The width of the first reception zone or depth of the reception area will be determined by all the factors thusfar mentioned, and for an average long distance broadcast would probably be 800 to 1 500 km. The width of the second reception zone and consecutive reception zones will increase, the width of the silent zones decreasing correspondingly.

It should be noted that the ionosphere sets upper and lower limits of frequency usage. The higher frequencies will tend to penetrate the ionosphere while the lower frequencies will be absorbed. The frequency selection must be between these limits so that desirable signal levels are obtained in the respective Radio RSA listening areas.

From the preceding, it should be evident that frequencies at our transmitting station have to be changed to either reach listeners in a new listening area, or to maintain favourable reception in one or more listening areas, these frequency changes being primarily dependent on the time of day and four seasons of the year.



Refraction from ionosphere
E=Broadcasting transmitter
T=Earth
Z=Reception zone
θ=Zenithal beamwidth

FIG. 2:2 Refraction from the Ionosphere.

CHAPTER 3

Shortwave Frequency Planning

Planning of shortwave frequency schedules would have been an easy matter if propagation theory and ionospheric conditions were the only problems to contend with. But unfortunately, the shortwave frequency spectrum is limited to a number of frequencies. The problem is further complicated due to the fact that there is a multitude of domestic and international services broadcasting on the shortwaves. The bands at times are so crowded that clear frequency channels are not available.

A department of the International Telecommunications Union – ITU – the International Frequency Registration Board – IFRB – with headquarters in Geneva, has the monumental task of co-ordinating the usage of frequencies over the entire frequency spectrum. That is, from longwave to the very high and ultra high frequencies, but the main problem is with the shortwave frequency spectrum and particularly, the international shortwave bands.

In the frequency range 2 to 5,95 MHz certain frequency bands have been allocated to the broadcasting service. Some of these bands are shared with other services such as fixed and mobile services. The bands allocated for broadcasting above 5,95 MHz have been allocated exclusively to the broadcasting service. The former are termed Tropical Zone bands and are used in countries lying between latitudes 30 degrees north and 35 degrees south of the equator for domestic service broadcasting. The frequency bands for broadcasting above 5,95 MHz are used internationally, as provided for under article 10 of the radio regulations and operate on a seasonal broadcasting system. The seasons commence on the first Sunday of the months March, May, September and November. On these dates, international broadcasting stations put into operation new frequency schedules to counter propagational conditions which may cause reception to deteriorate, if transmissions were maintained on the previous seasons frequency schedule.

According to the ITU procedure for submission of seasonal high frequency broadcasting schedules, the projected frequency schedules of all participating shortwave broadcasting stations around the world are to be submitted to the IFRB some five months in advance of their implementation. REFER FIGURE 3:1.

The IFRB carries out a technical examination of these frequency schedules with the aid of a computer and publishes the data in the form of a book termed The Tentative High Frequency Schedule. – REFER FIGURE 3:2

Copies of this book are then distributed to all participating shortwave broadcasting stations. Should there be any frequency clashed between stations such as two stations intending to use the same frequency to the same listening area, the computer will recommend alternative frequencies. In instances where alternative frequencies are not available, it is left to the broadcasting stations concerned to resolve the problem.

In theory the procedure should work well and in fact has gone a long way to ease the chaotic conditions existing in the chronically over-crowded shortwave broadcasting bands, but regrettably there are a few problems. Some stations do not forward their intended frequency schedules to the IFRB, others notify the IFRB only of certain frequencies, in addition, some stations do not always maintain their assigned frequencies or alter the times of operation. The ITU and IFRB fully recognises the sovereign right of each country to regulate its transmissions as it sees fit. Neither the ITU nor the IFRB have the power to order a government or transmitting station to stop its transmissions or to change its frequencies even when a station is causing severe interference. They can only suggest and recommend a course of action and hope that the country concerned will co-operate.

When planning a shortwave frequency schedule, it is necessary to first consider the ionosphere, for if the frequency selected for a particular zone is too high, the transmission will merely skip over the intended listening area and if too low, the transmission will be absorbed in the ionosphere before reaching the intended listening area. Secondly, the specific frequency selected should be such as not to clash with anticipated frequencies of other broadcasting stations.

To ascertain the correct frequency bands which will propagate favourably over the various circuits from our Meyerton transmitting station to your location, we use computer predictions obtained from the National Institute for Telecommunications Research, a department of the Council for Scientific and Industrial Research, here in Johannesburg. – REFER FIGURE 3:3. The predictions are termed "long term predictions" in which the nature of the ionosphere is predicted six months in advance, thus enabling us to compile projected frequency schedules and to submit these to the IFRB five months in advance of implementation, in accordance with article 10 of the Radio Regulations.

As soon as the IFRB Tentative High Frequency Schedule book is received at MPHQ, it is checked to see who is sharing Radio RSA's frequencies and who is adjacent to our frequencies. If there are frequency clashes we will look at the IFRB's alternative frequency recommendations, make some last minute frequency changes and notify the IFRB via the Postmaster General's office, which is the administrating body controlling frequency allocations in South Africa. On the other hand, the IFRB may have been unable to recommend an alternative frequency or frequencies, then we will seek a solution by negotiating directly with the station or stations concerned, or we might decide to try the schedule and see how we get along for the first couple of weeks of the seasonal period and then make some changes if necessary.

Once the frequency schedule comes into operation, reception reports are the only means by which success of the schedule in question can be assessed. At MPHQ, all reception reports received from our monitors are analysed by means of a system of grouping and averaging of SIFO readings received from individual reception zones. From this information percentage success graphs are plotted for each reception zone. Should these reports indicate that reception on all frequencies intended for a particular area are unsatisfactory, then all the factors involved in transmitting a signal to the particular listening area have to be evaluated and a solution

sought. Needless to say, that this is not always as easy as it may seem due to the limited number of frequencies available.

In some instances, this is further aggravated by a weak ionosphere not capable of refracting frequencies effectively. If reception reports indicate that low signal level is experienced, then a higher or lower frequency may have to be used, or alternatively, reception may be marred by interference and it may be necessary to search for a clear frequency channel. To obtain a clear frequency channel we may telex or cable an international broadcasting organisation who has a monitoring facility in the listening area, where we have a problem, requesting that they should advise us of a clear or more viable frequency which, naturally, must be within a metre-band allocated to broadcasting which will propagate favourably from Meyerton to the particular listening zone. Alternatively, we may send a pre-paid cable to one of our monitors requesting information about the availability of clear frequency channels.

There are two further provisions of the international frequency management plan. The first is that broadcasting stations must notify the IFRB of any new frequency assignment or amendments. Notification of these changes are published in a weekly circular which is mailed to all participating broadcasting stations. In our own interest and in the interest of the international frequency management plan these have to be taken into consideration before changing to a frequency recommended by Panel Members. Once a change has been effected we once more notify the IFRB via the Postmaster General's office.

The second provision is that at the end of each seasonal period, broadcasting stations must inform the IFRB of those transmissions that in practise were found to be unsatisfactory. The IFRB then publishes a final schedule for the particular season termed High Frequency Broadcasting Schedule reflecting all the frequency changes and unsatisfactory transmissions notified to the IFRB since publication of the tentative schedule.

From this chapter it is evident that the frequency planning of an international shortwave broadcasting station is a very sophisticated procedure calling for the prediction of frequencies many months in advance of their use. After implementation the success of reception depends largely on goodwill and mutual co-operation between broadcasting stations, its listeners and monitors.

REPUBLIC OF SOUTH AFRICA

(a) Notifying administration

Form of Notice

For Use when Submitting to the International Frequency Registration Board a Seasonal High Frequency Broadcasting Schedule or a Change thereto

(See Article 10)

6 Class of station: **BC**

(b) Assignment for the particular season: X

(c) Change of characteristics of an assignment for the season:

(d) Deletion of an assignment for the season:

(e) Notice No. 5/SA/9/79
Date: 18/9/79

1a Assigned frequency: 17780 kc/s

1b Alternative frequency: kc/s

1c Frequency band: Mc/s

2c Date of putting into use in the particular season:
Season: MARCH / MAY / SEPT / NOV
Year: 80
Other date:

4a Name of transmitting station: MEYERTON

4b Country: AFS

4c Longitude and latitude of the transmitter site: 28 E 08 26 S 35

3 Call sign (identification): RADIO SOUTH AFRICA

Zone (s) or area (s) of Reception	Class of emission and necessary bandwidth	Power (in kW)	Transmitting antenna characteristics: Azimuth of max. radiation	Angular width of radiation main lobe	Antenna gain in db	Angle of elevation	Type of antenna	Hours of operation (G M T)	Other frequencies simultaneously utilized for same programme to the same area (s)	Supplementary information
5a	7	8	9a	9b	9c	9d	9e	10	11	
1–4,6–8	10A3	250	305	30	20	12	HRS/4/5/0,5	01h56–02h50		
37,38,46–48 52,53,57	"	"	340	"	"	"	HRS/4/3/0,5	04h56–07h50		
27,28,37,38, 46–48,52,53, 57	"	"	"	"	"	"	"	17h56–21h50		

12b ———— Name and postal address of administration (Article 15)

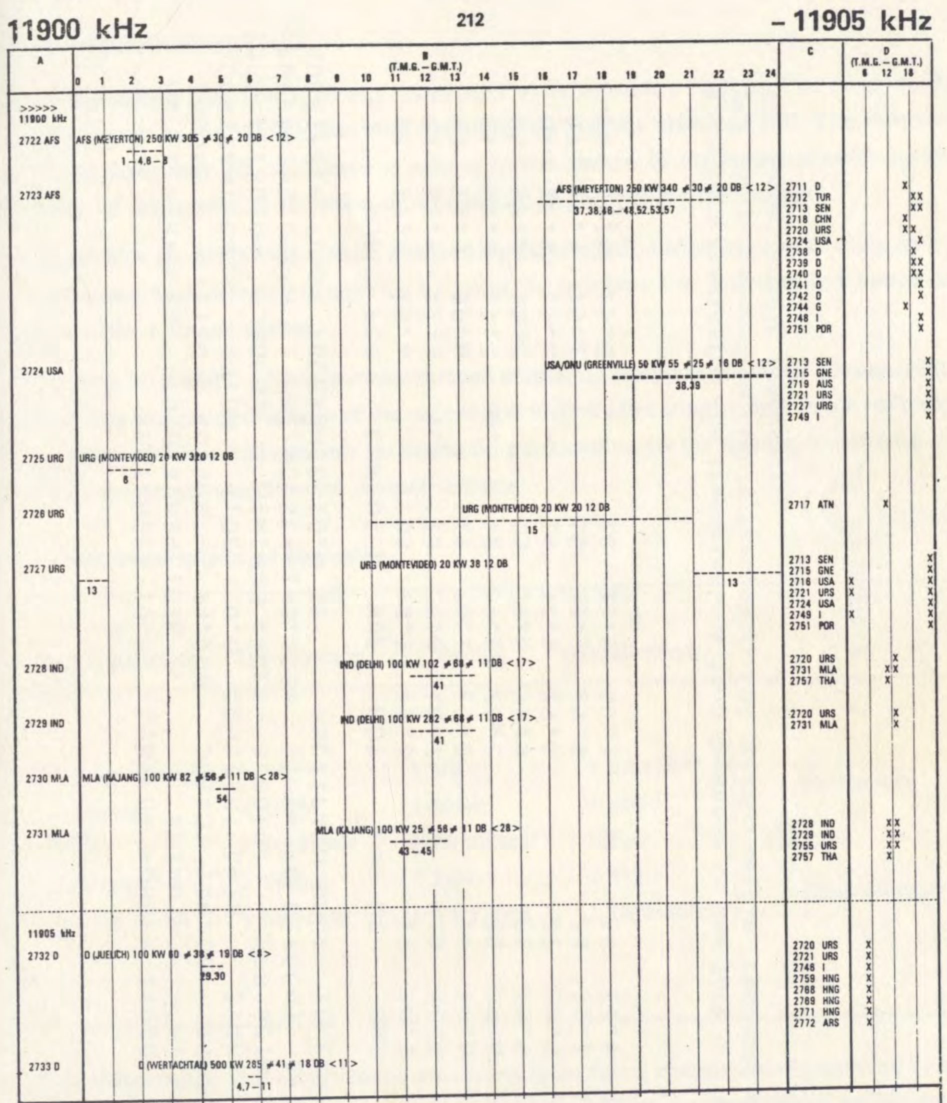
———— Telegraphic address

COORD/ ————

Other information

FIGURE 3 : 1

SABC NO 89



A section of a page from the IFRB "HF Tentative Schedule" is shown above. The station, its radiated power, angle of radiation and antenna gain are shown above the line. The target areas according to IFRB zoning is shown below the line. The Radio RSA frequency indicated is 11900 kHz. Stations which may cause mutual interference are shown in Column C together with their serial numbers. Column D indicates periods during which incompatibility has been determined by the IFRB.

FIGURE 3 : 2

11/58

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                 SEPTEMBER 1980    SUNSPOT NUMBER 140.0
H. F. VERWOERD    TO USA NEW YORK           AZIMUTHS      MILES      KM.
 26.58S -   28.13E    40.40N -   74.00W   304.31 104.06    7992.3  12861.8
CONSTANT GAIN    20.0H    0.0L    0.0  CONSTANT GAIN     2.0H    0.0L     0.0
OFF AZIMUTH=  0.0DEG.     MINIMUM ANGLE= 3.0DEG.     OFF AZIMUTH=  0.0DEG.
POWER=250.000KW  3 MHZ NOISE=-148.6DBW  TIME= 90 PERCENT  REQ.S/N=70.008
MULTIPATH POWER TOLERANCE=10.0 DB      MULTIPATH DELAY TOLERANCE= .85 MS.
```

UT	MUF	FOT	LUF	UT	MUF	FOT	LUF	UT	MUF	FOT	LUF
01	17.0	13.6		09	18.3	15.8		17	30.9	27.8	
02	15.4	12.3	4.6	10	21.8	18.7	-	18	31.1	27.9	-
03	13.3	10.6		11	26.2	23.0		19	30.6	26.3	
04	13.9	11.0	6.5	12	29.1	26.2	-	20	29.4	24.1	-
05	19.2	15.2		13	30.0	27.0		21	28.5	23.4	
06	19.8	15.6	-	14	32.9	29.6	-	22	25.9	21.3	8.9
07	18.4	15.2		15	33.2	29.8		23	21.7	17.6	
08	17.4	15.0	-	16	33.5	30.1	-	24	18.5	14.8	2.7

Long term prediction for transmissions from Meyerton to New York U S A.
MUF indicates maximum usable frequency, FOT optimum usable frequency and
LUT lowest usable frequency.

FIGURE 3 : 3

Chapter 4

RECEPTION REPORTING

There are several reception reporting codes used by broadcasting stations. The most widely used is known as the SINPO code with variations such as the SIFO and SIO. The reception reporting code may be considered a semi-technical means of informing a radio station engineer of the quality of reception of a broadcast as received by the listener.

At Radio RSA the SIFO code is used. S depicts signal strength, I ingerference, F fading and O overall merit. Each category is reported by using the numbers 1 to 5. Generally 5 means excellent while 1 means useless.

The code is brief and is a fairly accurate method of relating reception quality to a broadcasting station. The principle advantage of the code is that it eliminates lengthy descriptions of reception quality which would not only be far too time consuming for the listener, but also for the station's personnel who have to evaluate reports.

Detailed Description of the code.

S Signal Strength	I Interference	F Fading	O Overall Merit	
5 Very strong	5 Nil	5 Nil	5 Excellent	Satisfactory "S"
4 Strong	4 Slight	4 Slow	4 Good	
3 Fair	3 Moderate	3 Moderate	3 Fair	
2 Weak	2 Severe	2 Fast	2 Poor	Unsatisfactory "U"
1 Very Weak	1 Extreme	1 Very Fast	1 Unusable	

S Signal strength: This relates to the amount of radio signal energy actually captured by the receiver. The term is self-explanatory and the 1 to 5 scale offers the possibility of stating signal strength ranging from almost nil to something approaching that of a local high powered station with several inbetween ratings.

The signal strength values will vary between receivers of different manufacture and will also depend on the type of antenna used. To be considered complete a good reception report should therefore always include information concerning the make and model of receiver as well as the type of antenna used. By combining this data with the SIFO "S" rating, there is little difficulty in determining how well the signal is being received by most of the listeners in your area. A signal strength rating of "4" from someone with a quite modest receiver would tend to indicate that the broadcast was readily available to most listeners, while a poor signal strength rating of "2" from a Dxer with highly sophisticated equipment would mean that much of the potential audience was probably lost.

A signal strength meter is of assistance when assessing the value of a station's signal level, but signal strength meters are not always calibrated in accordance with the SIFO signal strength rating, and hence the following may serve as an approximate guide:–

Signal strength	Meter calibrated in dB	Meter calibrated in S units
5 Very strong	More than 60 dB	More than S9 + 40
4 Strong	45 to 60 dB	S9 + 20 to S9 + 40
3 Fair	30 to 45 dB	S9 to S9 + 20
2 Weak	15 to 30 dB	S7 to S9
1 Very weak	less than 15 dB	less than S7

I Interference: In the reporting code this relates to "man made" interference from other radio transmissions and it should not be confused with atmospheric noise which is always present on shortwave. In the event of interference the "I" rating obtained will be dependent on the selectivity and bandpass width of the receiver. If the station you are monitoring suffers interference from an adjacent station and your receiver's bandpass width is say 3 kHz then your interference observation will tend to indicate less interference than a listener using a receiver with a bandpass width of 6 kHz. As under "S" to be of value the reception report should therefore include information concerning the make and model of receiver. If the receiver has a switchable bandwidth then the kHz setting used during the monitoring observations should be entered next to the make and type of receiver. The increasing problem of more and more stations operating within the allocated frequency limits makes this observation very important. As under signal strength the code provides sufficient description of the degrading effects. It is however, of prime importance to include all possible information such as the name and frequency of the interfering station. If the interference is severe and if reflected in the majority of reports received from a particular reception zone, we may consider

contacting the interfering station or decide to use an alternative frequency. If the interfering station cannot be identified then the language used by the station could be useful and should be included.

There are various types of interference and they are denoted as follows:–

1. Heterodyne – denoted by H: In the overcrowded shortwave bands this may be recognised as a familiar whistle which is caused by a station operating adjacent to the station monitored.
2. Zero Beat – denoted by ZB: When two stations are operating on or very near the same frequency, a low frequency audio beat develops and in some instances the transmission monitored may sound distorted or both transmissions are heard simultaneously with no distortion.
3. Modulation Spread – denoted as Q: Modulation spread is caused by the programmes of an adjacent station splashing over the monitored transmission.
4. Jamming – denoted by J: Jamming is caused by deliberate interference from a station with the intention of spoiling and blocking a broadcast from another station. There are several types of jamming, but the most common is usually recognisable as a low frequency buzz similar to the sound of a low flying multipropeller driven aircraft.
5. Teleprinter – denoted by T: Radio teletype RTTY communications circuits are generally restricted to frequencies not within the bands allocated to the broadcasting service with the exception however, of the 120, 90, 75 and 60 metrebands which are shared with communications organisations. RTTY interference is usually recognisable as an audio tone alternating in pitch.
6. Morse Code – denoted by M: As under RTTY above, morse code operations are restricted to frequencies not within the bands allocated to the broadcasting service.
7. Summary of requirements when reporting interference. In order to provide useful information of interference, you should please endeavour:–
   - 7.1. To identify the source of interference, i.e. the name of the station. If the station cannot be identified then if possible indicate the language used by the station.
   - 7.2. To identify the type of interference, i.e. H, ZB, Q, J, T, M.
   - 7.3. To indicate the operating frequency of the interfering station, or if your receiver's dial calibration is not accurate to estimate the frequency of the interfering station, or to indicate whether it is above or below our transmission frequency.
   - 7.4. The information related to interference is placed in the remarks column – refer example of a reception report on page 23.

F Fading: Fading is always present on shortwave broadcasts and is recognisable as a variation in signal strength. It is caused mainly by inconsistencies and turbulence within the ionosphere. Due to the instability within the ionosphere the wave front when reaching the receiving antenna is composed of in phase and out of phase components, the out of phase components giving rise to a weakening signal with the in phase components giving rise to a strengthening signal.

Fading can be a major factor affecting reception quality especially on the trans equatorial path. In some instances, it may be the depth of fading and in others, the frequency of fading, i.e. "flutter fading" which may mar a good signal.

O Overall Merit: As the name implies, this is a summation of the general "readability" of the transmission. The first three parts of "SIFO" are used to describe certain specific observations, and "O" is the combined net result. This is the rating where the monitor can give his opinion of quality of the broadcast monitored at a particular time. The monitor's opinion is placed in one of two nutshells:

"Satisfactory" or "Unsatisfactory"

Satisfactory – denoted by "S": If the transmission's overall quality is fair to excellent, i.e. rating "3 to 5" and, although interference and/or fading may be present, it is pleasant to listen to and you can listen to it without undue difficulty, then the signal is considered satisfactory.

Unsatisfactory – denoted by "U": If the transmission's overall quality is poor to unusable "2 to 1" and you cannot listen to it without undue difficulty, or owing to low signal level and/or fading and/or interference, it is not pleasant to listen to, then the signal is considered unsatisfactory.

Reception Report Remarks Column

Any remarks pertaining to the "SIFO" report made at the time are placed in this column. The information should relate to reception details only, i.e. interference, type of interference, frequency of interfering station and name of interfering station. Should you observe any transmitter fault then this should also be noted in the remarks column. **No programme details** should appear in this column. If you have any comments to make or criticism of any particular programme, then please place this in the "Comments and General Observations" column.

It is perhaps necessary at this stage to mention that a report crammed with irrelevant details is of little value compared to a report containing the bare essentials; and if the over-detailed report is written in an undecipherable scrawl, it becomes valueless. Here is an example of an almost perfect report.

RADIO RSA

THE VOICE OF SOUTH AFRICA

MONITORING PANEL

NAME S. SIMONE

MEMBERSHIP NO. 53/Z/21

RECEIVER BARLOW WADLEY ANTENNA INVERTED L

REPORT NO. 6

DATE OF DESPATCH 8/3/80

FREQUENCY (kHz) 15250							FREQUENCY (kHz) 15155						
Date	Time G.M.T.	S	I	F	O	Remarks on Reception	Date	Time G.M.T.	S	I	F	O	Remarks on Reception
3/3	1800	4	4	4	S								
4	1800 1845	4 2	4 4	4 4	S S	SIGNAL LEVEL LOW TOWARDS END OF PROG. THIS EVENING							
5	1820	4	4	4	S	SEVERAL BREAKS AT 18.30 - 18.35							
6	1800	5	4	4	S	POWERFUL SIGNAL!							
7	1800 1845	4 2	4 4	4 2	S U	ALMOST FLUTTER FADING							
						21480 kHz							
3/3	1800	3	3	4	U	H EX VOA ON 21485							
4	1800	3	2	3	U	SEVERE S EX VOA AND J							
5	1800 1830	3 2	3 3	4 4	S U	H EX VOA							
6	1800 1845	3 2	4 3	4 3	S U	SIGNAL DEFINITELY IMPROVING H EX VOA							

Day after last report (or sooner)

Indicate in same bracket if there is any variation, e.g. drop in "S"

Columns may be sub-divided if you wish to report on more than 2 frequencies

Identify station causing interference and frequency

Frequency Recommendations

In the event of unsatisfactory reception being experienced, due to harmful interference from another station or stations on the same or almost the same frequency, Panel Members with accurately calibrated digital frequency readout receivers are welcome to recommend an alternative clear frequency channel. The recommended frequency channel due to propagational conditions will have to be within one of the metrebands used by Radio RSA to your particular listening area. Moreover, the frequency must be within the bands allocated to the broadcasting service. The bands allocated to the broadcasting service are as outlined in Chapter 7 under miscellaneous information.

Despatching of Reception Report

All reports received are statistically analysed by Radio RSA's frequency planning division. From this analysis, graphs are compiled which give an up to date picture of reception conditions in the intended target areas. This information is used to take whatever action deemed necessary to improve reception if the statistics shows that Radio RSA is received poorly. It follows that out of date reports are of little or no value and therefore Panel Members are requested to work according to the following "rule of thumb".

The date of the first report on your report sheet should not be older than 14 days when arriving at the MP Headquarters. The post to Johannesburg normally takes about 6 days from North America and 4 days from Europe and other areas, thus Members in North America should send their reports not later than 8 days after the date of the first report. Members in Europe and other areas should send their reports not later than 10 days after the date of the first report.

The problem will arise where a Member in Europe, for example, has made a report on say, 1st November, but does not have the time to make any further reports within the next 10 days. Should he send this report containing one reading only? Here one must use discretion. If a reading reflects a definite change in reception, it would be of value; if on the other hand it is very much the same as previous reports, it would be better to delay the form until such time when more readings could be included – in other words, the first reading (1 November) may be valueless, but consecutive readings taken on say, 15, 16, 17, 18 and 19th November, may be of value provided the report is despatched on or before the 22nd.

We realise that Members' time is restricted, but it would be very much appreciated if your report form could contain reports reflecting reception over at least 4 or 5 days.

The most valuable reception reports are undoubtedly those received as soon as possible after commencement of a new broadcasting season. The broadcast seasons, as mentioned in Chapter 3, commence on the first Sunday of the months March, May, September and November. Where at all possible, we would therefore appreciate members furnishing reports

during the first week of a new broadcasting season. Should there be any radical change in characteristics of one of our transmissions, such as increased interference, a special report would be very useful.

MAILING OF RECEPTION REPORTS:

Unnecessary delays are caused by sending reports to Radio RSA's normal addres. Please send all reports and letters pertaining to the Panel to:–

The Principal Engineer
P.O. Box 6
Honeydew 2040
Tvl. Republic of South Africa

Chapter 5

RADIO RSA's TRANSMITTING STATION

Radio RSA's huge transmitting station is located in a hilly region near Meyerton, south of Johannesburg. From here, Radio RSA – The Voice of South Africa – directs programmes in English, French, Portuguese, Dutch, German, Spanish, Lozi and other African languages to Africa, Europe, the Middle East, Canada, North and South America. The programmes originate from the studios of Radio RSA which are located in Auckland Park, Johannesburg, one of the world's largest broadcasting centres in the world, on one site.

A multitude of high steel masts towering into blue skies, with rows of antennas are the first signs of the shortwave station when approached from the small village of Meyerton. The main transmitter building, with antenna side-switching house, is equipped with powerful 500 kW and 250 kW transmitters. The transmitter tuning,antenna selection and slewing are controlled from two consoles in the large transmitting hall. From here, the powerful transmitters may be coupled to any of the station's 34 respective high gain antenna arrays to cover any of Radio RSA's target areas by pressing a single switch on one of the control consoles. The consoles also have pre-selection facilities so that a new frequency and antenna with appropriate orientation may be selected within seconds.

The cooling of the transmitters is by the vapodyne system which utilises the latent heat of steam in order to obtain more efficient cooling. The vapodyne system uses a small amount of distilled water and eliminates the use of old fashioned water pumps. The steam is condensed on the mezzanine level of the building by heat exchangers and returns to the transmitter valve anodes as water, from where it is once more circulated in the closed cooling system. This system of cooling has led to shortwave radio being referred to as "steam radio".

From the top of the large transmitter cabinets, the radio feeders go by way of crossbar switches in ducts down to vertical shafts which connect up with two tunnels of 2,4 metres square section and then to the round antenna feeder side-switching house. This unique system of an underground route for ducted feeders had to be used due to the large surface area which would have presented a hazard in strong gusts of wind in the case of overhead ducted feeders. The radio feeders enter the feeder switch-house along 5 horizontal rows of switches. These feeders are switched vertically and leave from the top of the building to the appropriate overhead feeder and accompanying antenna.

The directional antenna arrays on the 500 Ha site each consist of 2 curtains spaced a quarter of a wavelength apart. Each curtain is made up of 3 or 5 stacks of 4 halfwave dipole elements in a chain. When power from the transmitter is fed into the front curtain, the radiations from the individual dipoles are additive in the direction of the main listening zone, the total power gain achieved in some instances being as much as 20 dB which is equivalent to a magnification factor of 100. The antenna arrays have 10 general directions. By phasing, it is possible to swing the beam electronically 15 or 30 degrees away from its centre position to direct a transmission to a different target area. The general directions are 335 and 340 degrees for West Africa and Europe, 76, 20 and 7 degrees for East Africa and the Middle East, 305 degrees for North America 240, 260 and 270 degrees for South America and 350 degrees for Central Africa.

The general antenna directions are as indicated on the great circle map with Radio RSA's Meyerton transmitting station at its centre as indicated in Figure 5:1.

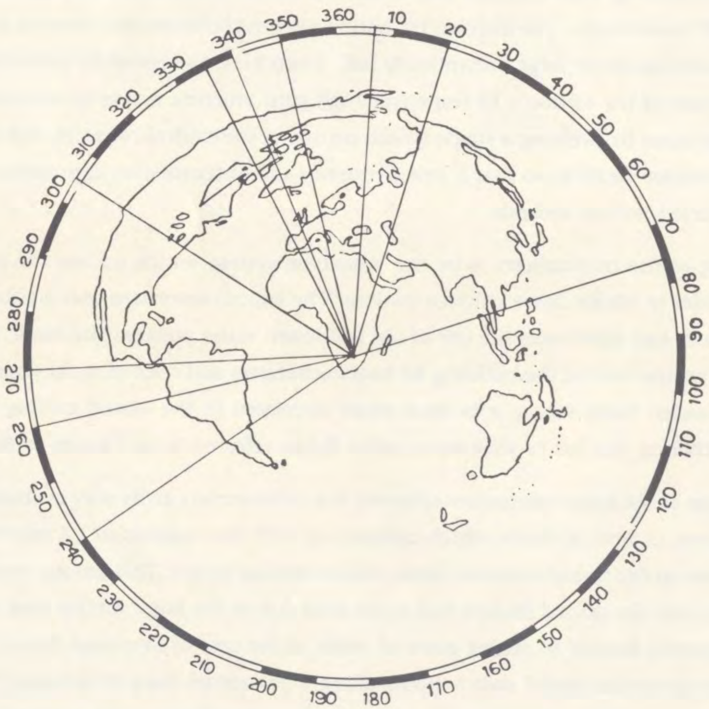
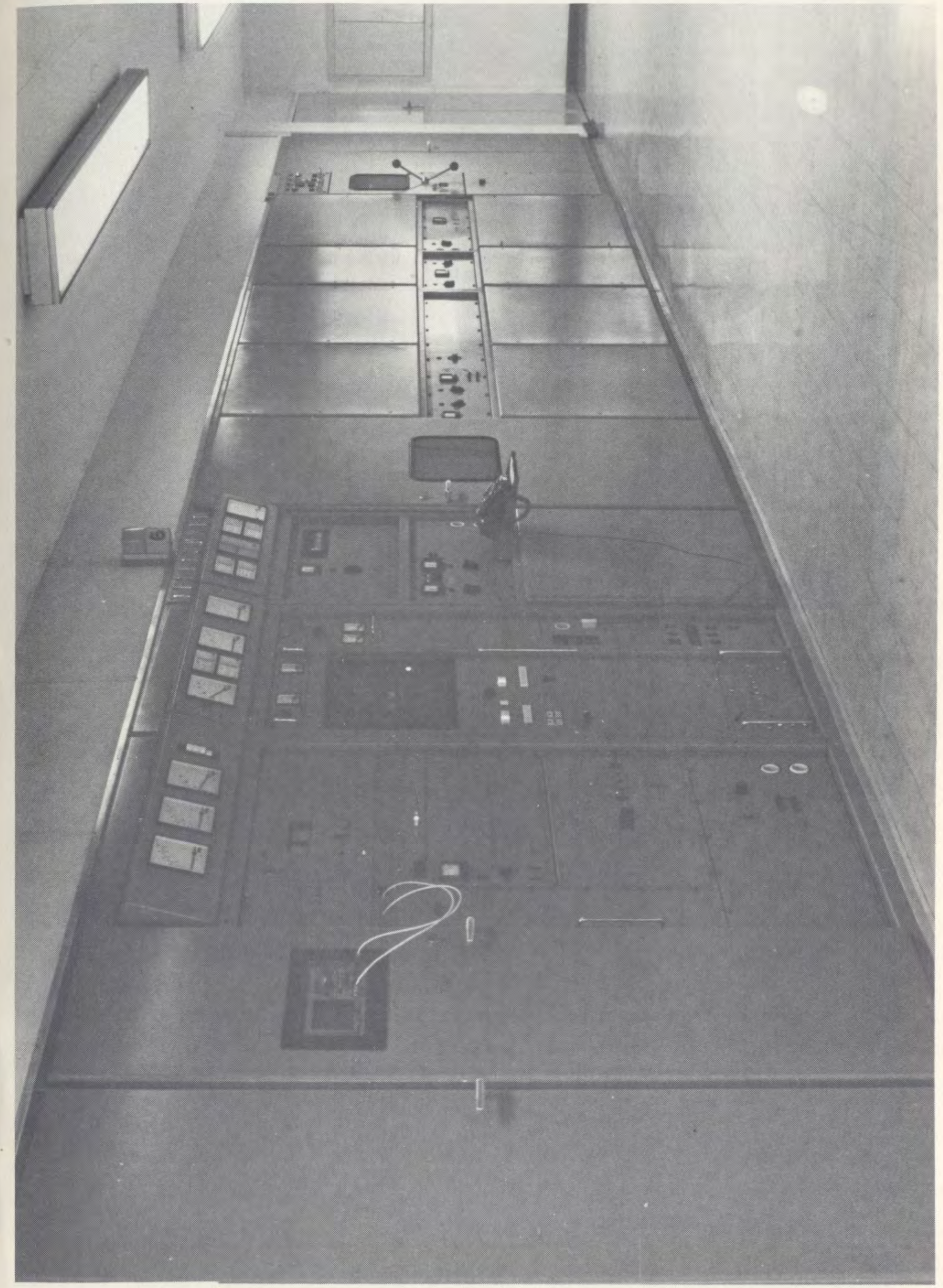
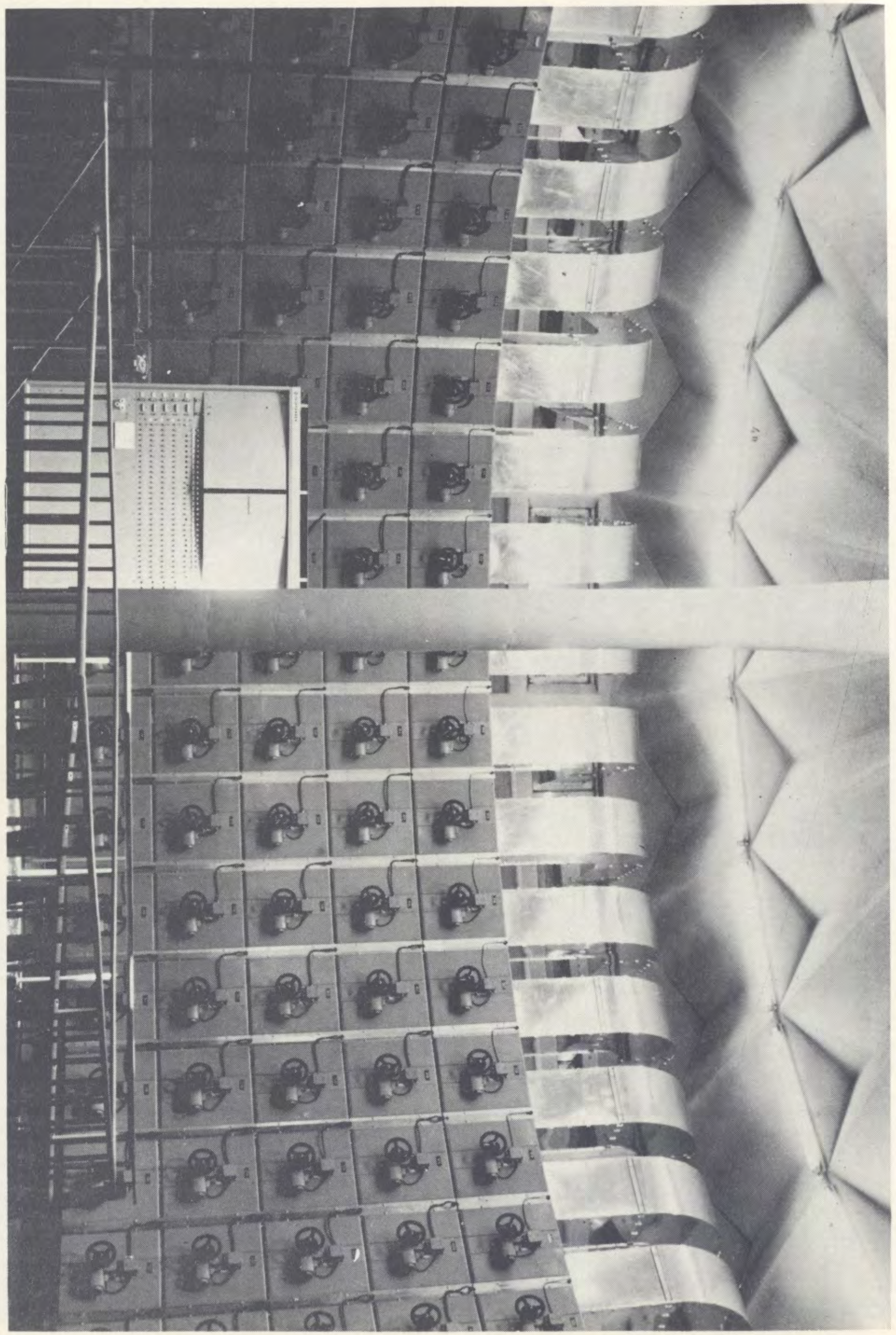


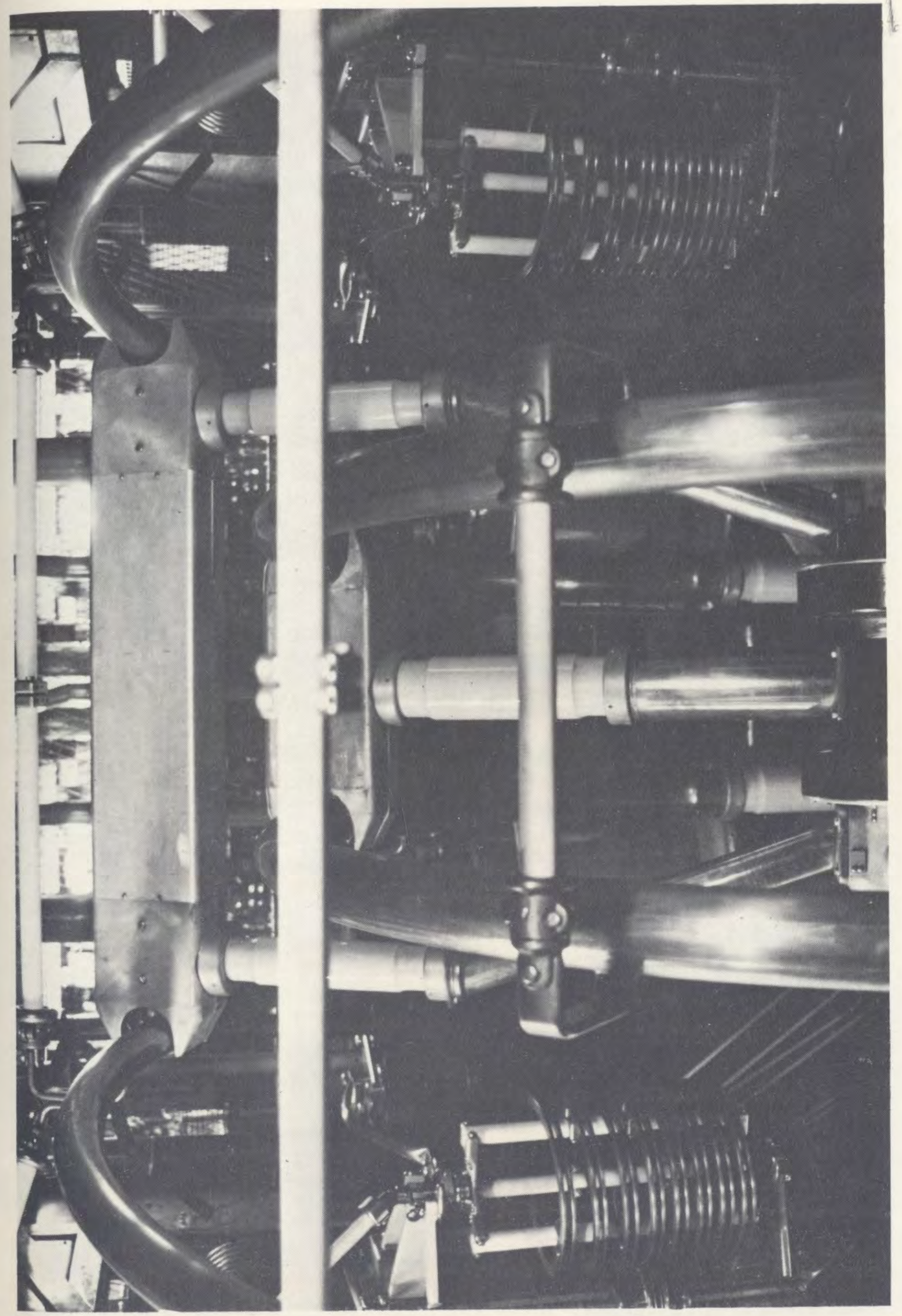
FIGURE 5:1 General Antenna Directions.



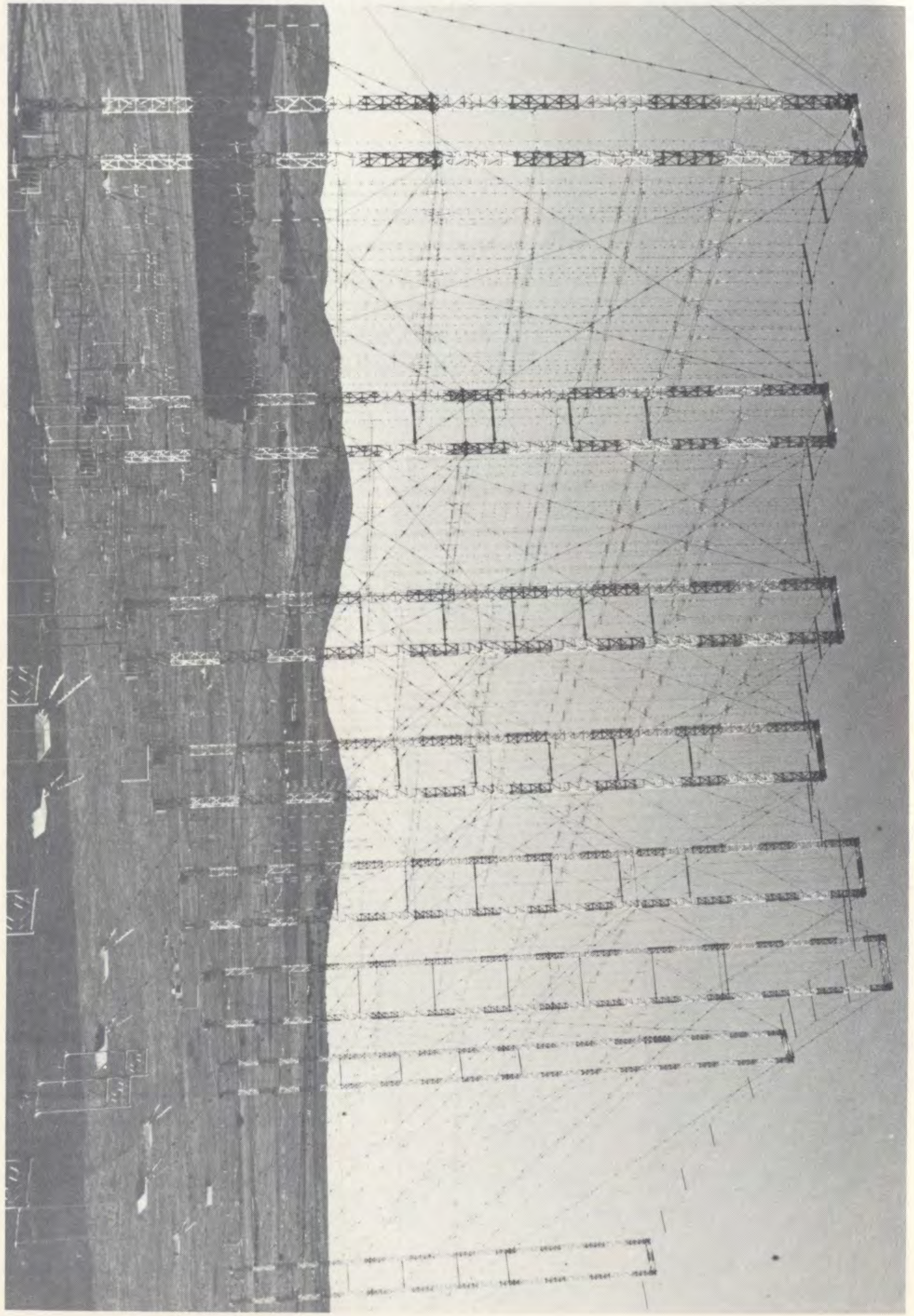
One of Radio RSA's 500 kW Transmitters



Antenna Side Switching Hut



Tuning Section of a 250 kW Transmitter



North American Antenna Arrays

CHAPTER 6

Receiving Antennas

Radiowaves are intercepted by the receiver's antenna and it follows that although there are many portable receivers capable of operating with only a telescopic antenna, a good outdoor antenna well away from obstructions will give much better results.

There are a number of antennas to choose from, the more sophisticated types being expensive and requiring a great deal of ground space. We will therefore confine ourselves only to the most popular type for home construction where space is usually limited.

Inverted-L

Probably the most widely used antenna of all types available is the Inverted-L. It consists essentially of a horizontal length of wire insulated at both ends and is continued downwards at the end nearest to the receiver from where it is taken as near vertically as possible to the antenna socket of the receiver. The antenna should be erected as high as possible and may be anything from 10 to 45 metres in length.

The Inverted-L will provide satisfactory performance on short wavebands, but with some reduced performance in certain directions, particularly from stations lying in the directions off the ends of the horizontal section.

On medium and long waves the antenna is non directional with respect to the downlead, and it is quite immaterial which way the top section is run in relation to the direction of the transmitting station.

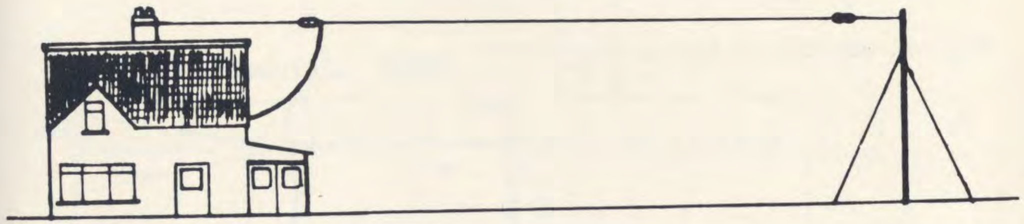


FIG. 6:1 – INVERTED-L ANTENNA

The Dipole

The dipole is a resonant antenna with a clear preference for signals arriving broadside to it. It consists of two colinear conductors of which the centre is connected to the receiver by means of an appropriate feeder arrangement. The length of the antenna must be comparable to the wavelength of the frequency to be received. In practise this is slightly shorter than half the wavelength of the radiowave. For optimum reception a different length antenna is therefore required for each of the wavebands used for broadcasting. To construct dipoles for all these wavebands is considered far too elaborate for the average listener, but there is a way around this and that is to construct a multiband dipole designed to receive up to three wavebands. The antenna connection to the receiver is by means of a 75 to 70 ohm co-axial feeder or alternatively, plastic insulated lamp cord may be used.

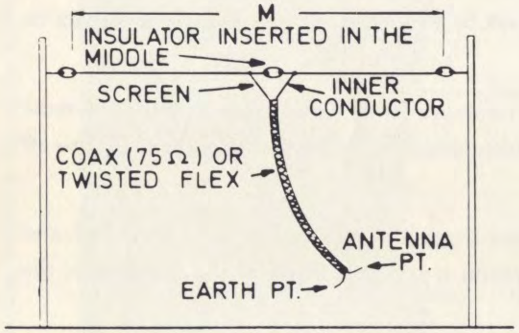
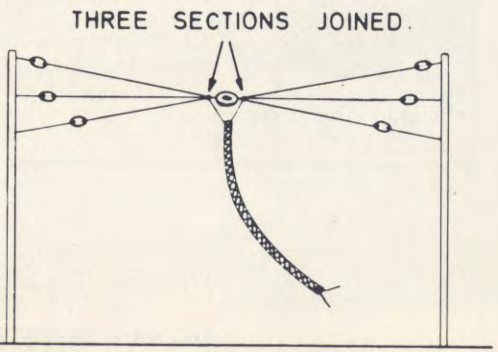


FIG. 6:2 – DIPOLE ANTENNA

FIG. 6:3 – MULTIBAND DIPOLE



The length of dipole may be calculated from the following formula:

Length in metres M = 143 ÷ frequency in MHz

Example: A dipole is required for the 19 metre broadcast band.
As the centre frequency of this band is approximately 15,2 MHz the length of the dipole is 143 ÷ 15,2 = 9,4 metres

The same formula is used to calculate individual lengths of the multiband dipole.

Ground-plane

A very effective antenna for general shortwave coverage is the vertical ground-plane. This consists of a vertical rod, insulated at its base and cut to be a quarter-wave long at whatever is to be the preferred centre frequency. Radiating from its base at equal angles, and as nearly horizontal as possible, are four connected wires, each a quarter-wave in length and insulated from the vertical element. The vertical element and the four "ground-plane" radials are taken to the inner conductor and screening, respectively, of a 50-70 ohm co-axial downlead, which may be of any length. The base of the antenna should be as high as possible, and the construction lends itself well to chimney mounting. In this case the radial wires may be taken downwards at an angle of about 45°, if necessary, and may serve as guy wires by including low-capacitance insulators at the quarter-wave points.

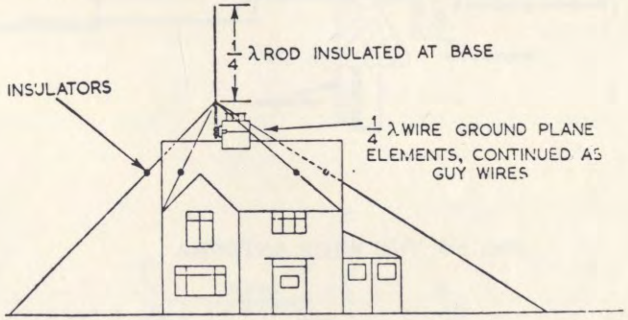


FIG. 6:4 – VERTICAL GROUND-PLANE ANTENNA

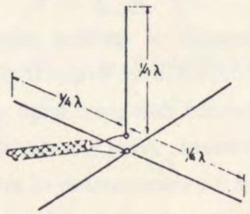


FIG. 6:5 – FEEDER CONNECTION OF GROUND-PLANE ANTENNA

The length of the quarter-wave sections may be calculated from the following formula:

Length in metres = 72 ÷ frequency in MHz.

The Whip Antenna

The whip antenna can be concealed to some extent and is recommended in instances where flat owners do not permit the erection of antennas. It will not be as good as some of the other antennas described in this chapter, but should prove satisfactory if mounted outside a window or balcony as shown in figure 6:6

The whip should be as long as possible, but wind can cause problems if it is too long. The whip antenna should preferably not be close to the wall of the building. A solution is to erect it so that it forms an angle of about 45° with the wall.

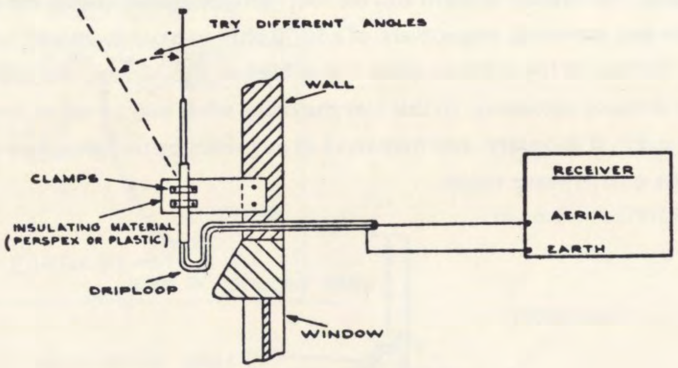


FIG. 6:6 THE WHIP ANTENNA

Anti-Interference Antenna System

A major source of interference capable of spoiling reception in heavily built up areas, praticularly in flats, is from domestic appliances. Under these conditions the effects can be very largely reduced by using a twin screened downlead from an antenna which is mounted sufficiently high to be above the more intense fields found inside the building. The screen of the downlead is then earthed to prevent the transmission of interference to the inner conductors, thus allowing the antenna signal to pass unaffected by interference to the receiver.

A further reduction of interference may be obtained by using two matching transformers, one either end of the screened cable. The transformer arrangement is such that it transforms the high impedance of the antenna to the low impedance of the cable, while the transformer at the receiver end of the cable transforms the low impedance of the cable to the high impedance of the antenna input circuit of the receiver.

A typical installation is illustrated in Fig. 6:7 with the corresponding circuit arrangement shown in Fig. 6:8.

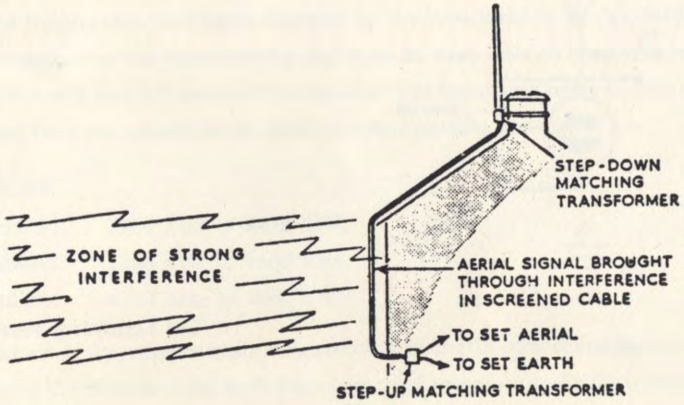


FIG. 6:7

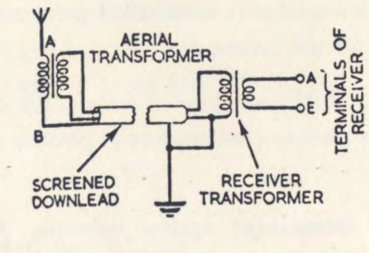


FIG. 6:8

Lightning Protection

Removing the antenna-plug from the receiver is the best lightning protection. Automatic gas lightning protectors as shown in Figure 6:9 may be used, but they are not always safe because the unit will become conductive only if the voltage-surge on the antenna exceeds a predetermined value which could be as high as 70 volts. A good ground is essential if the arrestor is applied.

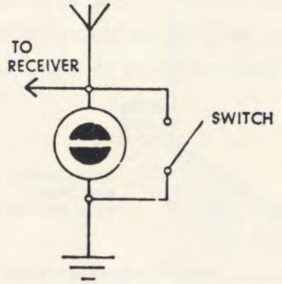


FIG. 6:9 Gas Lightning Protector

Antenna Do's and Don'ts

1. The antenna should be well clear of obstructions such as galvanised iron roofs, overhead power lines, wire fences, trees and telephone lines.
2. The lead-in should be as short as possible and must be soldered to the antenna.
3. Use single or stranded bare copper wire for antenna construction. Use insulated wire, co-axial cable, or lamp cord for the lead-in.
4. A good earth is essential. A cold water pipe or a metal rod driven into the ground will work well. It should be as close to your receiver as possible and use heavy copper wire from ground to receiver.
5. The receiver should be safeguarded against lightning, therefore a good "antenna/earth" switch should be installed.
6. In houses with thatched roofs, particular care should be taken to ensure that neither the antenna nor the lead-in to the receiver is anywhere near the thatch.

CHAPTER 7

Miscellaneous Information

1. **Shortwave Broadcasting Seasons**

   The shortwave broadcasting seasons commence on the first Sunday in March, May, September and November.

2. **Frequencies Allocated to the Broadcasting Service**

   Two sets of frequencies have been allocated to the broadcasting service. One is primarily used for domestic service broadcasting and may be used only in countries lying between latitudes 30° north and 35° south of the equator. The bands are referred to as the "Tropical Bands" and they are shared with other communication services.

   The bands are:

120 metreband	2300 kHz to 2498 kHz.
90 metreband	3200 kHz to 3400 kHz
60 metreband	4750 kHz to 5060 kHz

   The second set of frequencies with the exception of the 75 metreband have been allocated exclusively to the broadcasting service and are used internationally for Internal and External Service broadcasts.

   They are:

75 metreband	3950 kHz to 4000 kHz
49 metreband	5950 kHz to 6200 kHz
41 metreband	7150 kHz to 7300 kHz
25 metreband	11700 kHz to 11975 kHz
19 metreband	15100 kHz to 15450 kHz
16 metreband	17700 kHz to 17900 kHz
13 metreband	21450 kHz to 21750 kHz
11 metreband	25600 kHz to 26100 kHz

3. **Time Conversion Chart**

The time conversion chart has reference only to Radio RSA's target areas. Variations from standard time during part of the year in some countries are decided annually and hence actual time may vary by about one hour.

Country	Deviation from GMT	Country	Deviation from GMT
ANGOLA	+1	KENYA	+3
ARGENTINA	-3	MALAWI	+2
AUSTRIA	+1	MALI	GMT
BELGIUM	+1	MAURITANIA	GMT
BOLIVIA	-4	MIDDLE EAST	+2
BRAZIL		MOZAMBIQUE	+2
1) Eastern & Coastal	-3	NETHERLANDS	+1
2) Manaos	-4	NIGER	+1
3) Acre	-5	NIGERIA	+1
BURUNDI	+2	PARAGUAY	-4
CAMEROON	+1	PERU	-5
CANADA		PORTUGAL	GMT
1) Newfoundland	-3½	RWANDA	+2
2) Atlantic	-4	SENEGAL	GMT
3) Eastern	-5	SIERRE LEONE	GMT
4) Central	-6	SOMALIA	+3
5) Mountain	-7	SOUTH AFRICA	+2
6) Pacific	-8	SWITZERLAND	+1
7) Yukon	-9	TANZANIA	+3
CAPRIVI	+2	TOGO	GMT
CEN. AFR. REP.	+1	UGANDA	+3
CHAD	+1	URUGUAY	-3
CHILI	-4	UK	GMT
COLOMBIA	-5	UPPER VOLTA	GMT
CONGO	+1	USA	
DAHOMEY	+1	1) Eastern Zone	-5
ECUADOR	-5	2) Central Zone	-6
ETHIOPIA	+3	3) Mountain Zone	-7
FRANCE	+1	4) Pacific Zone	-8
GABON	+1	VENEZUELA	-4
GAMBIA	GMT	ZAIRE	
GERMANY	+1	1) Kinshasa	+1
GHANA	GMT	2) Lubumbashi	+2
GUINEA	GMT	ZAMBIA	+2
GUYANA	-3	ZIMBABWE	+2
IRELAND	GMT		
IVORY COAST	GMT		

4. Country Symbols

The following is a list of international country symbols which may be used for identification purposes of interfering stations in reception reports:–

COUNTRY SYMBOLS

AFG	Afghanistan	CBG	Khmer Rep	GHA	Ghana
AFS	South Africa	CHI	Taiwan	GIB	Gibraltar
AGL	Angola	CHL	Chile	GIL	Gilbert Is
ALB	Albania	CHN	China People's Rep	GMB	Gambia
ALG	Algeria	CKH	Cook Is	GNE	Equatorial Guinea
ALS	Alaska	CLM	Colombia	GNP	Guinea – Bissau
AND	Andorra	CLN	Sri Lanka	GRC	Greece
AOE	Spanish Sahara	CME	Cameroon	GRL	Greenland
ARG	Argentina	CNR	Canary Is	GTM	Guatemala
ARS	Saudi Arabia	COG	Congo	GUB	Guyana
ASC	Ascension Is	COM	Comoro Is	GUF	Guyana Fr
ATN	Netherlands Antilles	CPV	Cape Verde Is	GUI	Guinea
ATR	Antarctica	CTI	Ivory Coast	GUM	Guam
AUS	Australia	CTR	Costa Rica	HKG	Hong Kong
AUT	Austria	CUB	Cuba	HNB	Belize
AZR	Azores	CVA	Vatican City State	HND	Honduras Rep
B	Brazil	CYP	Cyprus	HNG	Hungary
BAH	Bahamas	D	Germany Federal Rep	HOL	Netherlands
BDI	Burundi	DDR	Germany Dem Rep	HTI	Haiti
BEL	Belgium	DJI	Djibouti	HVO	Upper Volta
BEN	Benin	DNK	Denmark	HWA	Hawaii
BER	Bermuda	DOM	Dominican Rep	I	Italy
BGD	Bangladesh	E	Spain	IND	India
BHR	Bahrain	EGY	Egypt	INS	Indonesia
BLR	Byelorussia	EQA	Ecuador	IOB	British West Indies
BOL	Bolivia	ETH	Ethiopia	IRL	Ireland
BOT	Botswana	F	France	IRN	Iran
BRB	Barbados	FJI	Fiji Is	IRQ	Iraq
BRM	Burma	FLK	Falkland Is	ISL	Iceland
BRU	Brunei	FNL	Finland	ISR	Israel
BUL	Bulgaria	G	Great Britain	J	Japan
CAF	Central African Rep.	GAB	Gabon	JMC	Jamaica
CAN	Canada	GDL	Guadeloupe	JOR	Jordan

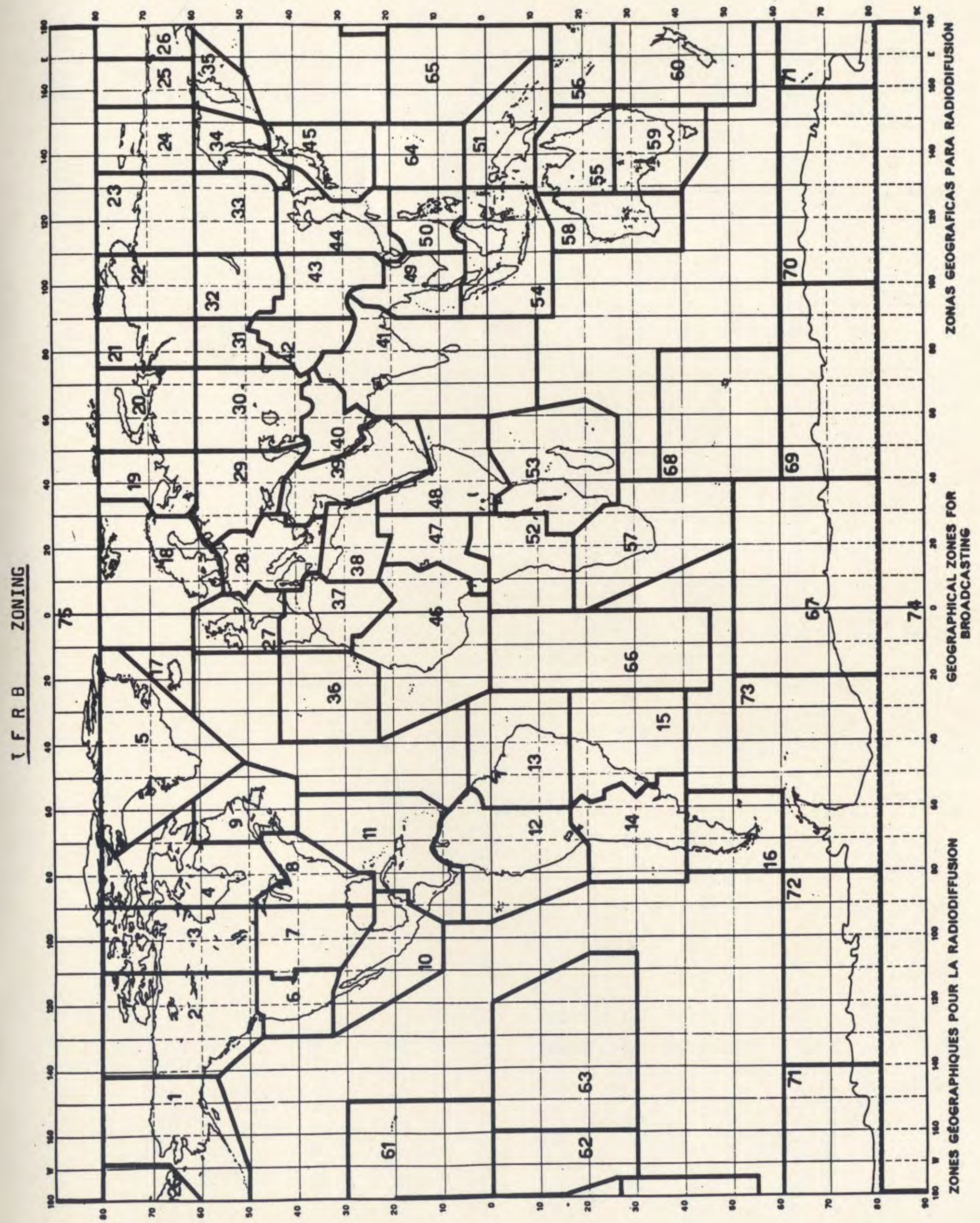
KEN Kenya
KOR Korea Rep
KRE Korea Dem People's Rep
KWT Kuwait
LAO Laos
LBN Lebanon
LBR Liberia
LBY Libya
LIE Liechtenstein
LSO Lesotho
LUX Luxembourg
MAC Macao
MAU Mauritius
MCO Monaco
MDG Malagasy
MDR Madeira
MEX Mexico
MLA Malaysia
MLD Maldives
MLI Mali
MLT Malta
MNG Mongolia
MOZ Mozambique
MRC Morocco
MRT Martinique
MTN Mauritania
MWI Malawi
NCG Nicaragua
NCL New Caledonia
NGR Niger
NHB New Hebrides
NIG Nigeria
NMB Namibia
NOR Norway
NPL Nepal
NRU Nauru Is
NZL New Zealand
OCE Polynesia Fr

OMA Oman
PAK Pakistan
PHL Philippines
PNG Papua New Guinea
PNR Panama
POL Poland
POR Portugal
PRG Paraguay
PRU Peru
QAT Qatar
REU Reunion
RHS Zimbabwe
ROU Romania
RRW Rwanda
RYU Ryukyu Is
S Sweden
SDN Sudan
SEN Senegal
SEY Seychelles
SHN St Helena
SLM Solomon Is
SLV El Salvador
SNG Singapore
SOM Somalia
SPM St Pierre & Miquelon
SRL Sierra Leone
STP St Thome & Principe
SUI Switzerland
SUR Surinam
SWZ Swaziland
SYR Syria
TCD Chad
TCH Czechoslovakia
TGK Tanzania
TGO Togo
THA Thailand
TMP Timor Por
TON Tonga

TUN Tunisia
TUR Turkey
UAE United Arab Emirates
UGA Uganda
UKR Ukraine
URG Uruguay
URS U.S.S.R.
USA U.S.A.
VEN Venezuela
VIR Virgin Is
VTN Viet-Nam People's Rep
YEM Yemen Arab Rep
YMS Yemen People's Dem Rep
YUG Yugoslavia
ZAI Zaire
ZAN Zanzibar
ZMB Zambia

Afghanistan	AFG	Chad	TCD	Guam	GUM
Alaska	ALS	Chile	CHL	Guatemala	GTM
Albania	ALB	China People's Rep	CHN	Guinea	GUI
Akgerua	AKG	Colombia	CLM	Guinea – Bissau	GNP
Andorra	AND	Comoro Is	COM	Guyana	GUB
Angola	AGL	Congo	COG	Guyana Fr	GUF
Antarctica	ATR	Cook Is	CKH	Haiti	HTI
Argentina	ARG	Costa Rica	CTR	Hawaii	HWA
Ascension Is	ASC	Cuba	CUB	Honduras Rep	HND
Australia	AUS	Cyprus	CYP	Hong Kong	HKG
Austria	AUT	Czechoslovakia	TCH	Hungary	HNG
Azores	AZR	Denmark	DNK	Iceland	ISL
Bahamas	BAH	Djibouti	DJI	India	IND
Bahrain	BHR	Dominican Rep	DOM	Indonesia	INS
Bangladesh	BGD	Ecuador	EQA	Iran	IRN
Barbados	BRB	Egypt	EGY	Iraq	IRQ
Belgium	BEL	El Salvador	SLV	Ireland	IRL
Belize	HNB	Equatorial Guinea	GNE	Israel	ISR
Benin	BEN	Ethiopia	ETH	Italy	I
Bermuda	BER	Falkland Is	FLK	Ivory Coast	CTI
Byelorussia	BLR	Fiji Is	FJI	Jamaica	JMC
Bolivia	BOL	Finland	FNL	Japan	J
Botswana	BOT	France	F	Jordan	JOR
Brazil	B	Gabon	GAB	Kenya	KEN
British West Indies	IOB	Gambia	GMB	Khmer Rep	CBG
Brunei	BRU	Germany Dem Rep	DDR	Korea Dem People's Rep	KRE
Bulgaria	BUL	Germany Federal Rep	D	Korea Rep	KOR
Burma	BRM	Ghana	GHA	Kuwait	KWT
Burundi	BDI	Gibraltar	GIB	Laos	LAO
Cameroon	CME	Gilbert Is	GIL	Lebanon	LBN
Canada	CAN	Great Britain	G	Lesotho	LSO
Canary Is	CNR	Greece	GRC	Liberia	LBR
Cape Verde Is	CPV	Greenland	GRL	Libya	LBY
Central African Rep	CAF	Guadeloupe	GDL	Liechtenstein	LIE

Luxembourg	LUX	Portugal	POR	Upper Volta	HVO
Macao	MAC	Qatar	QAT	Uruguay	URG
Madeira	MDR	Reunion	REU	U.S.A.	USA
Malagasy	MDG	Zimbabwe	RHS	U.S.S.R.	URS
Malawi	MWI	Romania	ROU	Vatican City State	CVA
Malaysia	MLA	Rwanda	RRW	Venezuela	VEN
Maldives	MLD	Ryukyu Is	RYU	Viet-Nam People's Rep	VTN
Mali	MLI	St Helena	SHN	Virgin Is	VIR
Malta	MLT	St Pierre & Miquelon	SPM	Yemen Arab Rep	YEM
Martinique	MRT	St Thome & Principe	STP	Yemen People's Dem Rep.	YMS
Mauritania	MTN	Saudi Arabia	ARS	Yugoslavia	YUG
Mauritius	MAU	Senegal	SEN	Zaire	ZAI
Mexico	MEX	Seychelles	SEY	Zambia	ZMB
Monaco	MCO	Sierra Leone	SRL	Zanzibar	ZAN
Mongolia	MNG	Singapore	SNG		
Morocco	MRC	Solomon Is	SLM		
Mozambique	MOZ	Somalia	SOM		
Namibia	NMB	South Africa	AFS		
Nauru Is	NRU	Spain	E		
Nepal	NPL	Spanish Sahara	AOE		
Netherlands	HOL	Sri Lanka	CLN		
Netherlands Antilles	ATN	Sudan	SDN		
New Caledonia	NCL	Surinam	SUR		
New Hebrides	NHB	Swaziland	SWZ		
New Zealand	NZL	Sweden	S		
Nicaragua	NCG	Switzerland	SUI		
Niger	NGR	Syria	SYR		
Nigeria	NIG	Taiwan	CHI		
Norway	NOR	Tanzania	TGK		
Oman	OMA	Thailand	THA		
Pakistan	PAK	Timor Por	TMP		
Panama	PNR	Togo	TGO		
Papua New Guinea	PNG	Tonga	TON		
Paraguay	PRG	Tunisia	TUN		
Peru	PRU	Turkey	TUR		
Philippines	PHL	Uganda	UGA		
Poland	POL	Ukraine	UKR		
Polynesia Fr	OCE	United Arab Emirates	UAE		



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RADIO
RSA
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RADIO R.S.A
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RADIO RSA

THE VOICE OF SOUTH AFRICA

P. O. BOX 6, HONEYDEW 2040, TRANSVAAL, SOUTH AFRICA

MONITORING PANEL

MV/mv APRIL, 1987

NEWSLETTER NO. 138

Dear friends

As I write this, the Autumn temperature is making itself felt, which means that we are steadily approaching winter, time for woollies to be taken out. Our summer has been marked with an above average rainfall, a number of sweltering hot days, but otherwise a summer enjoyed by all, excellent for the sun lover.

On February 6, the staff at Panorama went on a tour of the H F Verwoerd Transmitting Station . We left Panorama at 07h00 UTC arriving at Meyerton 09h00 UTC. After a tour of the station, which I found very interesting, we were entertained to a braai at their private club house - some of us even tried a hand at darts! It was a most enjoyable and interesting day, arriving back at Panorama exhausted but in good spirit.

At the present time we are still short staffed, but hopefully we will have someone with us shortly. In the meantime we will endeavour to keep our monitors informed of happenings here at Panorama.

Reception has been satisfactory, especially transmissions to the United States and Latin America, we have also had some good reports from the United Kingdom and Europe. Unfortunately it was necessary for us to make frequency changes, which might have caused some inconvenience to our monitors, we apologise if this was the case. Our monitors must also be thanked for their reports, comments and bandscans, this has enabled us to select frequencies best suitable.

We wish to appeal to our monitors not to send in reports with only one or two entries, we would much rather you send in a report once a month with 10 or more entries, such a report will be of great value to us, whereas the other is of little value to us.

One other issue is that one or two of our members keep completed reception reports pending for upto 6 months before sending them on to us, unfortunately these reports are of no value to us, please ensure that reports are forwarded on a regular basis.

Munro is at present updating "The Antenna" booklet, it is now nearing completion, once it has been retyped and printed, it will be made available to interested monitors. This booklet will be beneficial to serious shortwave listeners, and can be obtained from this office. We will inform you as soon as it is ready.

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Well that is all from me for now. Munro joins me in sending you his very best wishes.

Minnie Visser

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OBITUARY:

Debbie Gordon, staff member at the Monitoring Panel Headquarters passed away on 7th February after a short illness. Mr Carels (Snr) father of Piet Carels of The Netherlands passed away suddenly on 31 January. We wish to extend our sincere condolences to the families of Debbie and Mr Carels.

MAILBAG:

Heartiest congratulation to our new mummy and daddy, Steve Forest and his charming wife became the proud parents of a beautiful baby girl, Amanda Caryn on February 12 at 14h27 UTC.

Everet Macloed is celebrating his 20 anniversary as monitor for Radio RSA, congratulations Everet, a great achievement - how about another 20 years!

One of our monitors wants to know whether it is necessary to enter programme details on the official Monitoring Panel reception form. No, this is definitely not required from our monitors, all we need is comments on our reception.

QUIZ 34:

The winners of Quiz 34 will be announced in our next Newsletter, so if there are still members who wish to send in entries, please do so, there is still plenty of time.

The question to Quiz 35 is: In how many languages does Radio RSA broadcast, and in which year did it start its broadcasts? That really should be easy.

BIRTHDAYS:

The following members will be celebrating a birthday, we wish to take this opportunity in wishing them a very happy birthday, enjoy the day and God bless.

MAY:

Arend Bretveld, Neth. Chris Hawk, USA. Graham Powell, UK. Bill Giesbrecht, Canada. Sylvère Roosen, Belgium. Nicolas Eramo, Arg. Ivan Huapaya, Peru. Bernard Hübner, Neth. Jurgen Kohler, W. Ger. Douglas Doull, New Zealand. John Mpundo, Zambia. Albert Wijshake, Neth. Enio Hernandez, Guatemala. Henk van der Laan, Neth. Ralf Munster, USA. Giovanni Lorenzi : Italy.

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Birthdays continued:

Charles Willet, USA. James Kanjoka, Malawi. Jeff Elson, USA. Useni Chapayama, Malawi. Christopher Williams, UK. Norman Barsby, UK. Gerard Casey, France. Ronald Cross, UK. Alan Libert, Canada. Sergio Hache, Arg. Erich Schulman, USA. Philip Wright, Canada. Franciscus Baelemans, Neth.

JUNE:

Antonio Gonzales, Arg. Carlos Gravena, Brasil. Robin Gray, UK. Hardy Micheel, W. Ger. Sara Lizama, Chile. Joe Morris, UK. Allen Dahringer, USA. Vagn Holberg, Denmark. Jerry Lenamon, USA. Harold Booth, British West Indies. Jorge Anllo, Arg. Earl Greaver, USA. Wayne de Jong, Canada. Paul Trioreau, France. Joao Aguiar, Brasil. Francisco Ramirez, Colombia. Daniel Gloor, Swit. Kaunda Mponda, Zambia. George Jackson, USA. Heinz Lüers, W. Ger. Dustin Brann, USA. Peter Hell, W. Ger. Joseph Klein, Neth. Ernst Loch, Swit. Louis de Bergalis, USA. Andre Perret, Canada. Ernst Brown, UK. Frederick Hoertel, USA. Jean-Pierre Kratz, France. Eduardo Recinos, El Salvador. Tabare Lomia, Uruguay. Fawcett Dixon, UK. Arnold Petric, Austria. Steve Forest, USA. Urbain Verhaeghe, Belgium.

JULY:

Siegfried Höfig, W. Ger. Robert Zilmer, USA. Sheryl Paszkiewicz, USA. Francisca da Silva, Brasil. Karl Gress, W. Ger. Wolfgang Berndt, W. Ger. Richard Haenle, W. Ger. Eugenio Menton, Paraguay. Giorgio Romanin, Italy. Marcus Do Carmo, Brasil. Klaus Kohler, GDR. William Bergadano, USA. George Wilson, UK. Franz Schwartz, USA. Thomas Lindner, W. Ger. Wim van Loon Saveur, Neth. Dannis Parker, UK. José de Barros Dias, Portugal. William Steele, Canada. Jon Sousa, Brasil. Bukasa Binene, Zaire. Rudolf Goswin, W. Ger. Alfredo Locatelli, Uruguay. Joseph Fijol, USA. Jean Rodier, France. Zdenek Elias, Czech. Woodrow Seymour, USA. Stan Porter, Malawi. Silvia Schumacher , Brasil. Lori Klosowski, USA. James Thornton, USA. Santiago Bautista, Peru. Karen Casterline, USA. Alan Pearson, N. Ireland. Helmut Hasslinger, Austria.

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LIST OF AVAILABLE QSL CARDS.

CARD NO.		DESCRIPTION	
6.	....	KAFFIRBOOM OR CORAL TREE	(LIMITED)
k.	....	CROWNED CRANE	(LIMITED)
M.	....	KAFFIRBOOM (ERYTHRINA CAFFRA)	(LIMITED)
P.	....	PROTEA CYNAROIDES	
Q.	....	JOHANNESBURG - LIGHTS OF RISSIK STREET	
S.	....	STATUESQUE STRIPES (ZEBRA)	
U.	....	MALACHITE KINGFISHER	(LIMITED)
V.	....	THE DRAKENSBERG (BASOTO HUNTERS)	
X.	....	JOHANNESBURG - AERIAL VIEW	
Y.	....	TABLE MOUNTAIN	
Z.	....	DURBAN - HOLIDAY CITY	
80/1	....	THE WARY AND THE WEARY (KING OF THE BEASTS)	(LIMITED)
80/2	....	MAGOEBASKLOOF	(LIMITED
80/4	....	SUNSET AND SILHOUETTE	
81/1	....	AFRICAN ELEPHANT	(LIMITED)
81/2	....	JOHANNESBURG - RISSIK STREET	(LIMITED)
81/3	....	AFRICAN ELEPHANT AT A WATER HOLE	(LIMITED)
82/1	....	PROTEA AND LEUCOSPERUM	(LIMITED)
82/2	....	BROWN HOODED KINGFISHER	
82/3	....	CAPE PENINSULA	
83/1	....	JOHANNESBURG LANDMARKS	(LIMITED)
84/1	....	PILGRIMS REST	(LIMITED)
84/2	....	BLOUBERGSTRAND	
85/1	....	DRAKENSBERG - HELICHRYSUM	(LIMITED)
85/2	....	FRANSCHHOEK - HUGENOT MUSEUM	
85/3	....	GARDEN SNAILS (HELIX ASPERSA)	(LIMITED)
86/1	....	ELANDSBERG	(LIMITED)
86/2	....	RICKSHA PULLERS	
VS	....	VOICE OF SOUTH AFRICA	
CS	....	COMPOSITE SCENE	
D6	....	DOMESTIC SCENES	