

Government of India
Ministry of Communications
Department of Telecommunications
Wireless Planning and Coordination Wing
20, Ashoka Road, Sanchar Bhawan, New Delhi

No. P-11014/34/2009-PP

Dated: 11.12.2023

ORDER

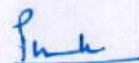
Subject: Spectrum Charges for Assignment of Frequencies to Captive Users (being charged on formula basis) for different types of Radiocommunication Services and applications.

In pursuance of the powers conferred under section 4 of the Indian Telegraph Act, 1885 (13 of 1885) and in supersession of this Ministry's Orders Nos. P-11014/34/2009-PP (I), (II), (III) & (IV) each dated 22.03.2012, the Central Government has decided that assignment of radio frequency spectrum to all users to whom radio frequency assignment is made through administrative process and spectrum charges are calculated based on a formulae, shall be made as per the methodology defined in this order.

2. Upon successful processing of application for assignment of radio frequency, a Letter of Intent (LoI) will be issued to the applicant which include, among others, information about the license fee and royalty charge (collectively called spectrum charges) required to be paid. Spectrum charges shall be informed for the full period of the assignment requested. If the request for assignment is for a period more than one year, the applicant can opt to pay the license fee and royalty annually, in advance for each year.

3. Immediately thereafter, but in any case not later than sixty (60) days from the date of issue of the LoI, the applicant shall pay the spectrum charges for issue of Decision Letter (DL), if otherwise permissible.

3.1 If the payment is not received within 60 days from the date of LoI, the application shall be treated as cancelled and the frequency shall be freed for assignment to other applicants. The applicant will have to submit a fresh application if they still want the frequency assignment.



4. A Construction Period of three months is permitted for the purpose of import of the equipment, site preparedness, deployment, etc. and spectrum charges be levied, after three months' period from the 1st day of the month of date of issue of LoI.

4.1 Three months' construction period shall not be applicable for temporary frequency assignment (assignment issued for the period less than one year). In such cases, spectrum charges shall be applicable from the 1st day of the month of date of issue of LoI.

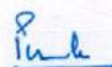
5. Initially, DL shall be issued with a validity of 15 months (one year plus three months of construction period) from the 1st day of the month of date of issue of LoI that can be further extended for a period of another one year subject to payment of annual spectrum charges, in advance. For example: If date of issue of initial LoI is 20th August 2023, the spectrum charges will be levied from 1st November 2023 and the initial DL will be valid upto 31st October 2024. Further extension of one year will be expired on 31st October 2025.

5.1 In no case DL be renewed further, however, extension of another one year may be considered for Government users under certain circumstances subject to payment of annual spectrum charges, in advance.

6. The spectrum charges, comprises of Royalty and License fee, shall be calculated for following radiocommunication services as per the enclosed schedules:

Schedule No.	Radiocommunication Services and applications	Page No.
I	Terrestrial Broadcasting service	6-7
II	Land Mobile Service (up to 375 kHz)	8-13
III	Maritime Mobile Service	14-16
IV	Aeronautical Service	17-18
V	Radar under Radionavigation Service and Radiolocation Service	19-20
VI	Fixed and Mobile Service (Multi-channels Multiplexed)	21-23
VII	Satellite Based Services (FSS, BSS, MSS, EESS)	24-26

6.1 All the above services have been defined in the National Frequency Allocation Plan of India (NFAP). The latest NFAP is available in DoT's website (www.dot.gov.in).



6.2 Spectrum charges, mentioned in all the schedules, are annual charges, unless otherwise specified.

6.3 Royalty charge has been made independent of numbers of equipment/set, unless otherwise specified. However, license fee will be applicable on them. Therefore, any increase/ decrease in the number of equipment (Fixed/ Mobile) in the existing frequency assignment shall require prior permission.

6.4 The spectrum charges due for different period shall be determined as follows:

License Period	License Fee Payable	Royalty payable after three months period from the 1 st day of the month of date of issue of LOI	Method of Payment
One calendar month or less	At specified rate given in various schedules	Annual Royalty divided by 12	Full License fee and Royalty to be paid in advance at the time of issue of DL/frequency assignment.
More than one calendar month but less than 12 months	At specified rate given in various schedules	On pro-rata basis. However, part of a month shall be taken as one month.	--do--
More than one year	At specified rate given in various schedules	On pro-rata basis. However, part of a month shall be taken as one month.	Pay the License Fee plus Royalty for the entire duration in advance at the time of issue of DL/frequency assignment or pay it in annual advance instalments.

7. Generally, there shall be no limit on number of frequency(ies) applied for any type of services. However, number of frequency(ies) shall be assigned subject to availability, technical justification, regulatory feasibility etc.

Push

8. Renewal of Frequency Assignment:

8.1 The assignee shall be responsible for keeping the frequency assignment current and up to date until its surrender/ cancellation. To this effect, the assignee shall, at least 30 days before the end date of the validity of the frequency assignment, pay through Saral Sanchar Portal, the spectrum charges for the renewal of his/her existing frequency assignment.

9. Frequency assignment/ authorization Modification Fee:

9.1. Applicable fees for modification in the frequency authorization/ frequency assignment shall be charged at the rate of Rs. 1000/- per modification.

10. Cancellation/ Surrender of Frequency Assignment:

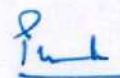
10.1 The assignee shall surrender the frequency assignment, if no longer required. To this effect the assignee shall apply for cancellation through Saral Sanchar Portal in accordance with OM No. L-14027/210/2020-WF dated 27.07.2023. Failure to surrender a frequency assignment within the stipulated time shall result in accrual of spectrum charges and late fee.

10.2 Non-purchase of equipment/ non-utilization of frequency assignment shall not be ground for exemption from payment of spectrum charges.

10.3 On surrender of frequency assignment, after adjustment of due spectrum charges, the balance amount will be either adjusted against other active frequency assignments or refunded to the applicant.

11. Late fee for delayed payment of Spectrum Charges:

11.1 Late fee shall be payable by the assignee on the frequency assignment for delay in payment of spectrum charges (Royalty and License fee) or any other dues payable against the frequency assignment. In this regard, any payment reflected in DoT's account after the midnight (2400 Hrs.) of the end date will be considered as a delay in payment irrespective of the date on which such transaction was initiated by the assignee of the frequency assignment.



11.2 The rate at which Late Fee is levied for a Financial Year shall be 2% added to one-year Marginal Cost of Lending Rate (MCLR) of State Bank of India, on the beginning of the Financial Year i.e. 1st April.

11.3 The Late Fee shall be compounded annually, subject to minimum annual Late Fee of Rs. 250/- per Frequency Assignment. A part of the month shall be considered as a full month for the purpose of calculation of Late Fee. A month shall be an English calendar month.

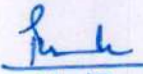
12. The applications for the frequency assignment shall continue to be processed through DoT's online portal (Saral Sanchar portal). Further, all renewals, cancellations, import permission, surrenders will also be issued through online portal (Saral Sanchar) as per prevailing instructions issued from time to time.

13. Any issue either arising due to interpretation of this Order or new uses/ applications not covered in the said Order shall be referred to the Standing Committee constituted vide WPC Wing OM of even No. dated 11.12.2023.

14. This Order issues with the approval of competent authority.

15. This Order shall come into force with effect from 01st April 2024. However, the revised spectrum charges on existing frequency assignments shall be applicable from the date of next renewal cycle.

Enclosure: As above.


11.12.2023

(P S M Tripathi)

Sr. Deputy Wireless Adviser to the Govt. of India

To,

1. All concerned.
2. Wireless Finance Division
3. Wireless Monitoring Organisation
4. IT cell, DoT - for publication on DoT Website
5. ITPC, BSNL, Pune to send text messages to all licensee informing them about the new orders on frequency assignment.

पी.एस.एम. त्रिपाठी / P.S.M. TRIPATHI
वरिष्ठ उप व्हायरल सलाहकार
Senior Deputy Wireless Adviser
दूरसंचार विभाग, भारत सरकार
Dept. of Telecom, Govt. of India
नई दिल्ली / New Delhi

Schedule-I: Terrestrial Broadcasting Services

General:

- (i) FM Broadcast (Analog) frequency plan is based on a 200 kHz channel Plan.
- (ii) The MF/ HF broadcast frequency plan is based on 20 and 10 kHz channel plan respectively.
- (iii) V/UHF Terrestrial-TV Broadcast frequency plan is based on 7/8 MHz Channel plan.
- (iv) The low power studio equipment shall not be used for outdoor events e.g. use in sports stadiums, outdoor social, cultural, religious events etc.
- (v) Hot Standby is permitted by default and no separate license fee or royalty for Hot standby equipment will be applicable.
- (vi) Permission for Community Radio Station standby station is included, and no separate permission will be required.

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Dr. M. S. Ramesh
Senior Deputy Wireless Assistant
Director, Ministry of Defence
Dept. of Telecom, Govt. of India
New Delhi

Part-I (Royalty Charges)

1. Annual Royalty Charges for Terrestrial Broadcasting Service:

Table-1

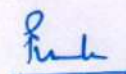
Type of Broadcasting	Power delivered to antenna	Royalty (in Rs) per radio station
Public Broadcasting (All India Radio and Doordarshan)	Sound:	
	Low Power FM (Up to 100 W)	30,000
	Medium Power FM (0.1 KW to 1KW)	60,000
	High Power FM (1KW-3KW)	1,25,000
	AM/MW Broadcasting	50,000
	Television:	
	Low Power TV (Up to 1KW)	VHF: 1,20,000 UHF: 3,60,000
	High Power TV (Above 1KW)	VHF: 1,20,000 UHF: 3,50,000
Private Commercial Broadcasting	FM stations	3,37,500
Community Radio Broadcasting (CRS)	Low power FM (Up to 50 W)	22,500

1.1 Royalty charges for Low Power indoor studio equipment will be Rs. 5000/- per set for lifetime use.

Part-II (License fee)

License Fee for stations under Broadcasting Service including standby sets:

S. No.	Type of Wireless station License	Annual License Fee (in Rs.)
i.	Broadcast transmitter station	500 per station
ii.	Low power studio equipment	250 per set (one time charge for lifetime)



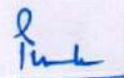
**Schedule-II: Land Mobile Services in LF/MF/HF/VHF/UHF bands
(Bandwidth up to 375 kHz)**

General:

- (i) Royalty Charges calculation for a frequency(s) will be based on the coverage area, the channel bandwidth of transmission, popularity of frequency band and the location-category; and will be independent of the number of stations using the same frequency(s) in a network.
- (ii) The Coverage category of Fixed-Site users is as per Table -2
- (iii) Highly Popular Bands, Medium popular Bands, Less Popular bands, and others are as per Table- 3
- (iv) The location category is as per Annex I.
- (v) "Fixed-site" covers small area applications such as industrial units, factories, municipalities, etc. and can comprise of one or more base stations, mobile stations, or any combinations thereof.
- (vi) Fixed-Site Charging methodology shall be applied where area of a district is small enough to be covered by four base/repeater stations.
- (vii) In case of a network spread across two location population categories (different class of cities) the charging of higher population category shall be applicable.
- (viii) Network having coverage beyond the Fixed-site category will be charged under District or State or Pan India category, as the case may be.
- (ix) Area users are those which operate over larger area of operations such as: Pan-India users like India Railways, Defense, Central Paramilitary forces (CPMFs), oil marketing companies, airports authority, etc; State-wide users such as: state police organizations, Disaster Management authorities, State Forest departments, electricity boards, water resources departments etc; district-wide users such as: public transport, district

authorities; and generally consist of several base stations, mobile stations, and combinations thereof.

- (x) It may be noted that area of operation of assigned frequency(ies) i.r.o. area users shall be restricted to their respective jurisdiction like Railways' operation will be limited along the railway track only, whereas security agencies will have their operational area over the entire area for which spectrum is assigned.
- (xi) Under Area-based State-wide category charging, States has been categorized into two categories (Category-A and Category-B) based on the GDP of the States. Accordingly, separate rates is applicable for the same frequency band.
- (xii) Royalty charges for frequency assignments that are in the sea (offshore), sub-surface use such as tunnel-radio will be charged at the minimum charging rate in the respective band/population category.
- (xiii) If the antenna is used indoors or underground or is a down-fire, leaky feeder or radiating cable type, it will fall within category 1 of the respective band/population area.
- (xiv) In order to promote efficient use of radio frequencies, number of Frequencies to be assigned to each user at a specific location in HF/VHF /UHF Land Mobile Service shall be as per the following criteria:
 - a. For Fixed-site operations, a maximum 10 simplex frequencies or 02 duplex frequencies will be assigned initially. Additional assignments will be based on justification.
 - b. The Royalty charges as in Table 1 will be applicable for the first 10 simplex channels or 2 duplex channels. Beyond these number of channels, an incremental additional charge of 30% higher for next 05 simplex channels or 02 duplex channels, and 50% higher charges on number of frequencies exceeding beyond 15 simplex or 04 duplex channels will be applicable.



- (xv) Royalty for VHF bands and above (more than 30 MHz), will be levied for the channel bandwidth and not for the occupied bandwidth. Minimum unit of charging is 12.5 kHz.
- (xvi) The Royalty charges for the systems using a 6.25 kHz channel size in VHF band and above (more than 30 MHz) will be half of that applicable for the basic 12.5 kHz channel size.
- (xvii) Royalty for LF/MF/HF bands (less than 30 MHz) will be levied for the channel width and not for the occupied bandwidth. Minimum unit of charging is 3 kHz.

Full

Part-I (Royalty Charges)

1. Annual Royalty for Fixed-Site networks:

Table 1: Annual Royalty (in Rs.) for Fixed-Site networks in VHF/ UHF band for 12.5 kHz bandwidth

Band category ¹	Highly Popular Bands (HPB)			Medium Popular Bands (MPB)			Less Popular Bands (LPB)
Coverage Category ²	1	2	3	1	2	3	1,2 or 3
Population category A ⁺	15,000	45,000	75,000	12,000	36,000	45,000	3,000
Population category A	10,000	25,000	40,000	8,000	24,000	36,000	
Population category B	7,500	15,000	25,000	5,000	12,000	20,000	
Population category C	5,000	10,000	15,000	3,750	7,000	15,000	
All others	3,000	5,000	8,000	2,000	4,000	5,000	

¹Refer to Table-3

²Refer to Table-2

* Half of the charges will be applicable for 6.25 kHz channel bandwidth

Table 2: The Coverage Category

Coverage categories	Combinations of Effective Radiated Power (ERP) in Watts (P), and Antenna height above ground level (Ah) in meters – for base station(s)	Possible operational area - Radius (R) in km
Category 1	$P \leq 5W$ and $Ah \leq 10m$	$0 < R \leq 3$
Category 2	$P \leq 5W$ and $10m < Ah \leq 30m$	$3 < R \leq 15$
	$P > 5W$ and $Ah \leq 10m$	
Category 3	$P > 5W$ and $Ah > 10m$	$15 < R \leq 30$
	$P \leq 5W$ and $Ah > 30m$	

Table 3: High/ Medium/Popular bands

Band categories	Bands	Frequency range (MHz)
Highly Popular bands (HPB)	VHF	137 – 174
	UHF-I	410 – 430
	UHF-II	430 – 470
Medium Popular bands (MPB)	UHF-III	380 – 400 800 MHz for CMRTS (except for IMT band)
Less Popular bands (LPB)	Any other band other than above	

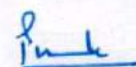
2. Annual Royalty for Area-based Operation in VHF/UHF band for Land Mobile stations:

Table-4: Annual Royalty (in Rs.)

Area	Royalty for Highly Popular bands	Royalty for Medium Popular bands	Royalty for Less Popular bands
All India	50,00,000	37,50,000	25,00,000
State-wide Category-A ¹	5,00,000	3,75,000	2,50,000
State-wide Category- B ²	3,00,000	2,25,000	1,50,000
District-wide	5 x Fixed site Coverage Cat-3	5 x Fixed site Coverage Cat-3	5 x Fixed site Coverage Cat-3

¹State-wide Category-A: Delhi, Maharashtra, West Bengal, Gujarat, Karnataka, Tamil Nadu, Uttar Pradesh, Andhra Pradesh, Telangana, Haryana, Kerala, Madhya Pradesh, Punjab, Rajasthan, Assam, Bihar, Chhattisgarh, Jharkhand, Himachal Pradesh, and Orrisa.

²State-wide Category-B: Uttarakhand, Sikkim, Goa, Meghalaya, Tripura, Nagaland, Arunachal Pradesh, Manipur, Mizoram and Union Territories.



3. Royalty Charges for UHF Short Range Radio (USR)

- (i) USR will continue to be permitted in the 350-351 MHz frequency band. However, the frequency assignments for USR will be made on non-exclusive basis, where the user will be free to select the operating frequency from a pool of earmarked frequencies mentioned at Annexure-2 of NFAP 2022.
- (ii) The USR system can be used anywhere in the country except restricted areas as notified by the Government. In restricted areas possession as well as operation of USR equipment are prohibited.
- (iii) The royalty charges will be at the minimum rates under the Fixed site category and license will be granted for not less than 5 years (non-refundable, renewable after five years for 5-year terms).

4. Royalty Charges for Land Mobile Service in LF/MF/HF band:

Table-5: Annual Royalty Charges

Frequency bands	Royalty Charges per annum per spot (irrespective of the number of sets) (in Rs.)
HF (3-30 MHz)	1,00,000
MF (300 kHz – 3 MHz)	50,000
LF (9 kHz to 300 kHz)	50,000

Part-II (License fee)

License Fee for wireless stations operating under Land Mobile service including Standby sets will be as under:

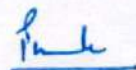
S.No.	Type of Wireless station License	Annual License Fee (in Rs.)
i.	Base/ Fixed Station	500 per station
ii	Vehicle / Handheld Mobile station	250 per station

Push

Schedule-III: Maritime Mobile Service in LF/MF/HF/VHF/UHF bands

General:

- (i) Maritime Mobile Services includes port operation service, ship movement service, which are also defined in NFAP.
- (ii) Frequency assignments to general public will be made on a non-exclusive basis.
- (iii) Ports and Search & Rescue (SAR) authorities shall be assigned the number of frequencies on an exclusive basis if requested by them.
- (iv) Royalty for VHF/UHF bands and above (more than 30 MHz), will be levied for the channel bandwidth and not for the occupied bandwidth. Minimum unit of charging is 12.5 kHz.
- (v) The Royalty charges for the systems using a 6.25 kHz channel size in VHF/UHF band and above (more than 30 MHz) will be half of that applicable for the basic 12.5 kHz channel size.
- (vi) Royalty for LF/MF/HF bands (less than 30 MHz), will be levied for the channel bandwidth and not for the occupied bandwidth. The minimum unit of charging is 3 kHz.
- (vii) No charges will be levied for the safety and calling frequencies mentioned at Para 2 of Part-I (Royalty Charges).
- (viii) The transmitting frequencies in the VHF maritime mobile band will be in accordance with APPENDIX 18 of Radio Regulation of ITU-R.



Part-I (Royalty Charges)

1. Annual Royalty for radio stations in Maritime Mobile Service:

Table-1: Annual Royalty Charges

Frequency Band	Royalty Charges per annum (in Rs.) (irrespective of the number of sets)
VHF (Except AIS ¹)	20,000
VHF (AIS/ ATON ²) (For two frequencies)	20,000
HF (3-30 MHz)	1, 00,000
MF (300 kHz – 3 MHz)	50,000
LF (9 kHz to 300 kHz)	50,000

¹AIS: Automatic Identification System

²ATON: AIS to Aid to Navigation (Physical/Virtual/Synthetic)

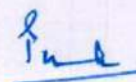
2. Frequency exempted from payment of spectrum charges Safety and calling frequencies:

Table -2: List of exempted frequency

Freq.	Mode	In VHF band (MHz)	In 2 MHz band (kHz)	In 4 MHz band (kHz)	In 6 MHz band (kHz)	In 8 MHz band (kHz)	In 12 MHz band (kHz)	In 16 MHz band (kHz)
Distress Alert Freq.	DSC	156.525 (Channel 70)	2187.5	4207.5	6312.0	8414.5	12577.0	16804.5
Distress traffic freq.	RTF	156.8 (Channel 16)	2182	4125	6215.0	8291.0	12290.0	16420.0
	*NBDP		2174.5	4177.5	6268.0	8376.5	12520.0	16695.0

* The latest ITU-R Recommendations will be followed.

2.1 Channel 06 (156.300 MHz: Safety and Inter-ship Communications), and Channel 13 (156.650 MHz: Inter-ship Navigation Safety), are also exempted from payment of spectrum charges.



Part-II (License fee)

License Fee for wireless stations operating under Maritime Mobile service including Standby sets:

S. No.	Type of Wireless station License	Annual License Fee (in Rs.)
1	Coast Station	500 per station
2	Vehicle /Handheld station	250 per station
3	Fishing trawlers	500 per trawler
4	Ship stations	5000 per ship

Free

Schedule - IV: Aeronautical Service in LF/MF/HF/VHF/UHF bands

General:

- (i) Aeronautical Service includes aeronautical mobile (R) service and aeronautical mobile (OR) service, aeronautical radio navigation service, which are also defined in NFAP.
- (ii) Frequency assignments for this service will be made on an exclusive basis.
- (iii) Royalty for VHF bands and above (more than 30 MHz), will be levied for the channel bandwidth and not for the occupied bandwidth. The minimum unit of charging is 12.5 kHz.
- (iv) The Royalty charges for the systems using a 6.25 kHz channel size in VHF/UHF band and above (more than 30 MHz) will be half of that applicable for the basic 12.5 kHz channel size.
- (v) Royalty for LF/MF/HF bands (less than 30 MHz) will be levied for the channel bandwidth and not for the occupied bandwidth. Minimum unit of charging is 3 kHz.

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Part-I (Royalty Charges)

1. Annual Royalty Charges for Aeronautical Mobile Service:

Table-1: Royalty Charges

Frequency Band	Royalty Charges (in Rs.) per annum per location (irrespective of the number of sets)
VHF/ UHF (ARNS/ AMS)	2,00,000 (For Tower and Approach) 75,000 (For Ground)
HF (3-30 MHz)	1,00,000
MF (300 kHz – 3 MHz)	50,000
LF (9 kHz to 300 kHz) (Radio Beacons, etc.)	50,000

ARNS: Aeronautical Radionavigation services: VOR (CVOR or DVOR), DME, NDB, TACAN, MARKER, GP, GS (ICAO definition may be referred).

AMS: Aeronautical Mobile Service (Route/off-Route)

Part-II (License fee)

License Fee for wireless stations operating under Aeronautical Mobile service including Standby sets:

Table-2: License Fee

S. No.	Type of Wireless station License	Annual License Fee (in Rs.)
1	Fixed Station	500 per station
2	Vehicle /Handheld Mobile station	250 per station
3	Aircraft stations	5000 per aircraft

12/11/16

Schedule-V: Radars under Radionavigation Service/ Radiolocation Services

General:

- (i) Radar is classified into low-power (less than 10-watt *EIRP*) and high-power radar systems (10-watt *EIRP* or higher).
- (ii) The royalty charges will be calculated based on the Necessary bandwidth (20 dB bandwidth) as per the Annexure-II and will be independent of the coverage distance.
- (iii) Royalty charges for low-power radars (payable at the beginning) shall be charged at 10% of one-year royalty charge of high-power radar of similar frequency ranges for use of the total life of the equipment or 10 years, whichever is earlier. It can be renewed for further periods in the multiple of 10 years under the extant rules.
- (iv) The royalty charges for Wind profiler radars will be calculated using a social factor of $\frac{1}{3}$ to the royalty charges of the high-power radar.

[Signature]

Part-I (Royalty Charges)

Annual Royalty Charges for high power radar station in Radio determination service /Radio Location Service:

Frequency Band	Rate (in Rs.) per 100 kHz
960- 2690 MHz	12,000
2690- 5000 MHz	12,000
5000-8500 MHz	3,000
8500- 14500 MHz	1,200
More than 14500 MHz	1,200

Part-II (License fee)

License Fee for wireless stations operating under Radio determination service / Radio Location including Standby sets:

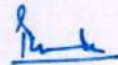
S. No.	Type of Wireless station License	Annual License Fee (in Rs.)
1	Radar Station	1000 per station

2
12

Schedule-VI: Fixed and Mobile Services having Multiplexed Multi-channels

General:

- (i) Charging methodology is based on $M \times C \times W$ formula (M = Basic Royalty, C =No. Freq. Carriers, W =Bandwidth Factor). It will be used for calculation of royalty charges for the Fixed services and Mobile services having multiplexed multi-channels.
- (ii) The rate of M -Factor will be calculated based on the maximum Coverage distance as per Table-1
- (iii) The bandwidth factor will be calculated as per Table-2. Any fraction would be rounded up to the next integer.



Part-I (Royalty Charges)

1. Annual royalty Charges for radio stations in Fixed Services and Mobile services having multiplexed multi-channels for Captive use will be multiplication of the M-factor (Basic Royalty), C-factor (No. of frequency carriers) and W-factor (Bandwidth).

$$\text{Royalty (R)} = \text{M} \times \text{C} \times \text{W}$$

Table-1: Rate of M-Factor

Distance Category	Maximum Distance (Km)	Value of M Factor
I	≤ 2	750
II	$> 2 \leq 5$	1500
III	$> 5 \leq 25$	3000
IV	$> 25 \leq 60$	6000
V	$> 60 \leq 120$	11000
VI	$> 120 \leq 500$	18750
VII	> 500	25000

Table-2: Rate of bandwidth factor

Slabs of Adjacent Channel Separation (BW), in MHz	Value of W factor
More than 375 kHz and including 2 MHz	30
More than 2 but ≤ 3.5	40
More than 3.5 but ≤ 7	60
More than 7 but ≤ 14	90
More than 14 but ≤ 28	120
More than 28 but ≤ 56	150
More than 56 but ≤ 112	180
More than 112 but ≤ 256	210
More than 256 but ≤ 512	240
> 512	$240 + 30 \times (\text{Excess bandwidth} / 256) *$

*That is, in steps of 256 MHz or part thereof

Part-II (License fee)

License Fee for wireless stations operating under Fixed and Mobile Services including Standby sets:

S. No.	Type of Wireless station License	Annual License Fee (in Rs.)
i.	Fixed station	1000 per station
ii.	Vehicle Mobile/ Handheld Mobile station	250 per station

Inc

Schedule-VII: Satellite based Services.

General:

- (i) Satellite based Service includes Fixed Satellite Services (FSS), Broadcasting Satellite Services (BSS), Mobile satellite Services (MSS) and Earth Exploration Satellite Services (EESS)
- (ii) The standard annual royalty factor shall be Rs. 35,000/- per frequency. The same rates will be applied for all applications under FSS, BSS, MSS and EESS together with the relevant Bandwidth Factor (Bs) given in Table-1 below to arrive at the amount of Annual Royalty (R) per frequency payable for an Uplink or Downlink.
- (iii) Royalty charges shall not be applicable on remote terminals of Data collection platforms. Only the license fee will be paid.
- (iv) Bandwidth factor for the bandwidth will be calculated in the multiple of 500 kHz and the remainder will be calculated using increments of 100 kHz.
- (v) The royalty will be charged on the total bandwidth assigned i.e., including any guard bands etc.
- (vi) The royalty charges for Earth-Exploration Satellite Services / Meteorological Satellite Service, will be calculated only once for every frequency carrier used by the remote users under these services.
- (vii) For Space Operation Services (TTC operation), the fixed royalty charges of Rs 1,50,000/- per Earth Station per annum will be levied.
- (viii) Royalty charges will be levied in respect of frequencies transmitted from or into Indian territory.



- (ix) For DSNG/SNG, the royalty charges will be levied for the frequencies used on both uplinks and downlinks. In case the same frequency carrier is used by the user from different OB vans belonging to licensee, additional royalty @ 25% of the basis royalty will be charged. However, if the additional OB vans are deployed within the same venue, e.g. a stadium, additional royalty @ 25% of the basis royalty will not be charged.
- (x) For temporary Up linking, a minimum royalty equivalent to that for one month will be charged.

h

Part-I (Royalty Charges)

1. Annual Royalty Charges for Satellite Based Services:

$$\text{Annual Royalty (R)} = \text{Rs. } 35000 \times B_s$$

Table-1: Calculation of Bandwidth Factor (Bs)

S. No.	Total Assigned Bandwidth		Bandwidth Factor (Bs)			
			For uplink		For downlink	
			Broadcast*	Others	Broadcast	Others
(i)	Up to and including 500 kHz, B _s is either of these three	Up to and including 100 kHz [i.e., BW ≤ 100 kHz]	0.25	0.20	Nil	0.20
(ii)		More than 100 kHz to up to and including 250 kHz [i.e., 100 kHz < BW ≤ 250 kHz]	0.60	0.50	Nil	0.50
(iii)		More than 250 kHz to up to and including 500 kHz [i.e., 250 kHz < BW ≤ 500 kHz]	1.25	1.00	Nil	1.00
(iv)	More than 500 kHz [i.e., BW > 500 kHz]		Total B _s			

*Broadcast in this case means those uses that are related to transmission of television content through satellite, and include, teleports, DSNG vans, DTH, HTS etc.

Total B_s = [Appropriate B_s from row (iii) above × bandwidth in number of multiple of 500 kHz] + [Appropriate B_s from row (i) above × number of multiple of 100kHz or part thereof in balance bandwidth]

where,

Balance bandwidth = remainder of [bandwidth/ 500 kHz]

Part-II (License fee)

License Fee for wireless stations operating under Satellite Services (FSS, BSS, MSS) including Standby sets

S. No.	Type of Wireless station License	Annual License Fee (in Rs.)
1	Fixed Earth station DTH/ Teleport/ DSNG/NLD/ILD/DCP/IP-II	1000 per station
2	Captive VSAT/Inmarsat Earth Station	500 per station
3	Vehicle Mobile/ Handheld Mobile station	250/- per station

Push

Annexure-I**Category-wise List of Cities**

Name of the City	State	Category
Chennai	Tamil Nadu	A+
Delhi	Delhi	A+
Kolkata	West Bengal	A+
Mumbai	Maharashtra	A+
Ahmedabad	Gujarat	A
Bangalore	Karnataka	A
Hyderabad	Andhra Pradesh	A
Jaipur	Rajasthan	A
Kanpur	Uttar Pradesh	A
Lucknow	Uttar Pradesh	A
Nagpur	Maharashtra	A
Pune	Maharashtra	A
Surat	Gujarat	A
Amritsar	Punjab	B
Agra	Uttar Pradesh	B
Allahabad	Uttar Pradesh	B
Asansol	West Bengal	B
Bhopal	Madhya Pradesh	B
Cochin	Kerala	B
Coimbatore	Tamil Nadu	B
Dhanbad	Jharkhand	B

Indore	Madhya Pradesh	B
Jabalpur	Madhya Pradesh	B
Jamshedpur	Jharkhand	B
Ludhiana	Punjab	B
Madurai	Tamil Nadu	B
Moradabad	Uttar Pradesh	B
Patna	Bihar	B
Rajkot	Gujarat	B
Vadodara	Gujarat	B
Varanasi	Uttar Pradesh	B
Vijayawada	Andhra Pradesh	B
Visakhapatnam	Andhra Pradesh	B
Ahmednagar	Maharashtra	C
Ajmer	Rajasthan	C
Akola	Maharashtra	C
Alappuzha (Alleppey)	Kerala	C
Aligarh	Uttar Pradesh	C
Amravati	Maharashtra	C
Aurangabad	Maharashtra	C
Bareilly	Uttar Pradesh	C
Belgaum	Karnataka	C
Bellary	Karnataka	C
Bhagalpur	Bihar	C
Bhavnagar	Gujarat	C
Bhubaneswar	Orissa	C

Bikaner	Rajasthan	C
Bilaspur	Chhattisgarh	C
Chandigarh	Chandigarh/UT	C
Dehradun	Uttarakhand	C
Devengeri	Karnataka	C
Dhule	Maharashtra	C
Erode	Tamil Nadu	C
Gaya	Bihar	C
Gorakhpur	Uttar Pradesh	C
Gulbarga	Karnataka	C
Guwahati	Assam	C
Gwalior	Madhya Pradesh	C
Hubli-Dharwad	Karnataka	C
Jalandhar	Punjab	C
Jalgaon	Maharashtra	C
Jammu	J&K	C
Jamnagar	Gujarat	C
Jhansi	Uttar Pradesh	C
Jodhpur	Rajasthan	C
Kakinada	Andhra Pradesh	C
Kannur	Kerala	C
Kolhapur	Maharashtra	C
Kota	Rajasthan	C
Kozhikode	Kerala	C
Kurnool	Andhra Pradesh	C

Malegaon	Maharashtra	C
Mangalore	Karnataka	C
Muzaffarnagar	Uttar Pradesh	C
Muzaffarpur	Bihar	C
Mysore	Karnataka	C
Nanded	Maharashtra	C
Nasik	Maharashtra	C
Nellore	Andhra Pradesh	C
Patiala	Punjab	C
Pondicherry	Pondicherry	C
Raipur	Chhattisgarh	C
Rajahmundry	Andhra Pradesh	C
Ranchi	Jharkhand	C
Rourkela	Orissa	C
Sagar	Madhya Pradesh	C
Saharanpur	Uttar Pradesh	C
Salem	Tamil Nadu	C
Sangli	Maharashtra	C
Shahjahanpur	Uttar Pradesh	C
Sholapur	Maharashtra	C
Siliguri	West Bengal	C
Srinagar	J&K	C
Tiruchy	Tamil Nadu	C
Tirunelveli	Tamil Nadu	C
Tirupati	Andhra Pradesh	C

Thiruvananthapuram	Kerala	C
Trissur	Kerala	C
Tuticorin	Tamil Nadu	C
Udaipur	Rajasthan	C
Ujjain	Madhya Pradesh	C
Vellore	Tamil Nadu	C
Warangal	Andhra Pradesh	C

** The above categorization of cities is based on the population as per MIB order dated 25th July 2011 [File No. 104/2/2008-FM(Vol-III)]*

Necessary bandwidth Calculation Method for Radar Applications for calculation of Royalty charges:

The necessary bandwidth (20 dB Bandwidth) of the transmitted signal, as mentioned in the manufacturer's data sheet will be used to calculate spectrum charges. If the manufacturer's data sheet does not contain information on the bandwidth (20dB bandwidth), the following formulate will be used:

For a non-FM modulated radar:

$$B_N = 1.79/\sqrt{t * tr} \text{ or } \frac{6.36}{t}; \text{ whichever is less}$$

For FM pulse radar:

$$B_N = 1.79/\sqrt{t * tr} + 2B_c$$

For FM pulse radar (with frequency hopping):

$$B_N = 1.79/\sqrt{t * tr} + 2B_c;$$

For frequency hopping radars using non-FM pulses (including spread spectrum or coded pulses:

$$B_N = 1.79/\sqrt{t * tr} + B_s;$$

for FM/CW radars $B(\text{necessary}) = 2B_d$

$$B_N = 2B_d;$$

Where:

B_N = necessary bandwidth in MHz

B_c = bandwidth of the frequency deviation (the total frequency shift during the pulse duration) in MHz.

B_d = bandwidth of the frequency deviation (peak difference between instantaneous frequency of the modulated wave and the carrier frequency for FM/CW radar systems) in MHz.

B_s = maximum range in MHz over which the carrier frequency will be shifted for a frequency hopping radar.

t = emitted pulse duration in μ sec at 50% amplitude (voltage) points. For coded pulses, the pulse duration is the interval between 50% amplitude points of one chip (sub-pulse). The 100% amplitude is the nominal flat top level of the pulse.

t_r = emitted pulse rise time in μ sec from the 10% to the 90% amplitude points on the leading edge. For coded pulse, it is the rise time of a sub-pulse; if the sub-pulse rise time is not discernible, assume it is 40% of the time to switch from one phase or sub-pulse to the next.

Radars will deploy best practices to reduce Unwanted Emissions (Out of band and spurious emissions)
