

COUNTRY REPORT



RADAR NETWORK OF BANGLADESH METEOROLOGICAL DEPARTMENT

Md.Aftab Uddin
Meteorologist
MMO Potenga,Chattogram
Bangladesh Meteorological
Department(BMD)
Email:aftab_bmd@yahoo.co
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Md. Omar Faruk
Assistant Communication
Engineer
NMCC, BMD
Email:omarfaruk_1864@yahoo.com

Outline

- About BMD
- □ Overview of the current radar system
- □ Specification of radar systems
- □ Maintenance of equipment
- Data processing
- □ Radar products
- □ Current technical problems
- Weather radar data QC
- □ Radar application
- □ Radar data publication and/ or exchange, and data format
- Challenges
- Future Plan



About BMD

The meteorological activities started in this country in 1877 through the establishment of one observatory in Satkhira during the British rule. In 1947, the service was renamed as Pakistan Meteorological Services. After the independence in 1971, it became Bangladesh Meteorological Department (BMD).

Bangladesh Meteorological Department is a government organization under the administrative control of the Ministry of Defence. BMD is mainly responsible for recording the meteorological observations and providing forecast and warnings for disaster management and all social economic activities.



BANGLADESH METEOROLOGICAL DEPARTMENT COMPLEX



BMD'S OBSERVATION SYSTEM



- Synoptic observatories : 35
 - ✓ MMO
 - ✓ DMO
 - ✓ Class 1 Obsevatories
 - ✓ Agrometeorological obs.
- Riverport Observatories: 14
- ✓ Pilot Observatories : 10
- ✓ Rawinsonde Observatories : 03
- Agrometeorological observatories : 12
- RADAR Stations: 05
 - ✓ Doppler 03
 - ✓ Conventional 02
- ✓ AWS: 60

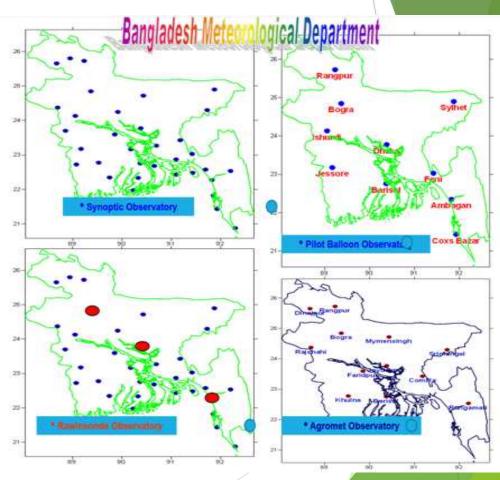




BMD'S OBSERVATION SYSTEM



- ✓ Carbon Emission Real Time Monitoring Stations: 10
- ✓ Seismic Observatory and Research Center: 01
- ✓ Broadband Seismometer: 10
- ✓ Wind Measuring System: 06
 - ✓ Analog: All airport 06
- ✓ Satellite Receiving Stations: 02
 - ✓ Himawari
 - ✓ GEO Kompsat-02
- **√** GTS: 10



Overview of the current radar system

- ☐ Dhaka radar is replaced at Joidevpur, Gazipur as a Doplar radar. It is now in operation.
- ☐ Rangpur radar is not operational from 2008 due to thundering. It's replacement work is going on
- ☐ KHP, COX and MLV doplar radar is not in operation. These three radars are very old. Warranty period is already gone. Lacking of spare parts as JRC stopped productions. Also software not working.

Doppler Radar in Bangladesh



Cox'sbazar Radar Station



Khepupara Radar Station



Moulvibazar Radar Station



DHAKA RADAR REPLACED BY

GAZIPUR RADAR







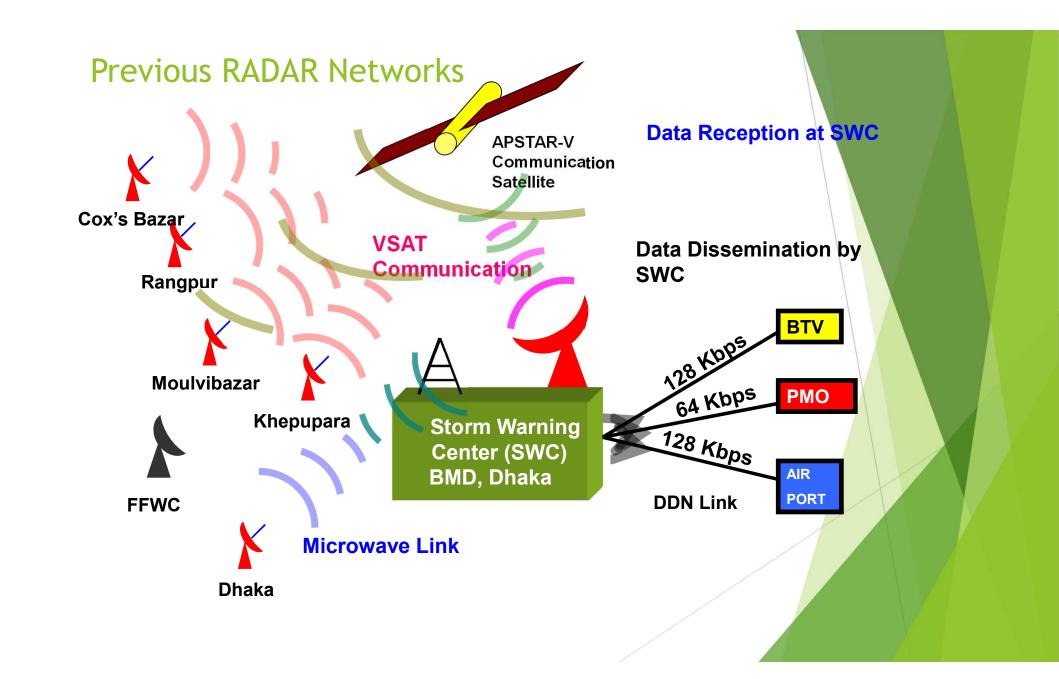












Current Radar Observation and Basic Specifications

| S | . Name of Rada Station | r Types | Manufactur er | Special Purpose | | | Radar F | Parameters | | |
|---|-----------------------------|------------------|----------------------|------------------------|--|----------------------------------|----------------------------------|----------------------------------|------------------------------|------------------------------|
| 1 | Dhaka Radar (2000) | Convention al | Mitsubishi, Japan | Civil Aviation | | DHK | RNG | COX | KHP | MLV |
| 2 | Rangpur Rada (2000) | Convention al | Mitsubishi, Japan | Norwester Detection | Antenna Diameter | 5 m | 5 m | 5 m | 5 m | 5 m |
| | | | | | Radar Range | 400 km | 400 km | 400 km | 400 km | 400 km |
| | | | | | Radar Tower Height (These heights are up to Radom) | 262 ft | - | 170 ft | 130 ft | 175 ft |
| | | | | | Amplifier Unit | Magnetron | Magnetron | Klystron | Klystron | Klystron |
| 3 | Cox'sBazar Radar (2007) | Doppler | JRC, Japan | Storm Warning | Power supply Backup system | UPS Batery Bank/Gener ator | UPS Batery Bank/Genera tor | Fly Wheel UPS/Generat or | Fly Wheel UPS/Generator | Fly Wheel UPS/Generator |
| | | | | | Tx Frequency | 2.81Ghz | 2.75 Ghz | 2.85 Ghz | 2.85 Ghz | 2.77 Ghz |
| 4 | Khepupara Radar (2008) | Doppler | JRC, Japan | Storm Warning | Pulse width | 2 us | 2 us | 1us-doppler 2us- Intensity | 1us-Doppler 2us-Intensity | 1us-doppler 2us-Intensity |
| | | | | | PRF | 220 Hz | 220 Hz | 320Hz 720 | 320Hz 720 | 320Hz 720 |
| | MoulviBazar Radar (2009) | Doppler | JRC, Japan | Flash Flood Warning | S min | -112 dB | -112 dB | -102dB | -102dB | -102dB |
| | | | | | Tx Power | 500kw (Rated) | 500kw (Rated) | 500kw (Rated) | 500kw (Rated) | 500kw (Rated) |
| | | | | | Software | ÌRIS | IRIS | ÎRIS | IRIS | IRIS |
| | | | | | OS | Linux/Wind ows | Linux | Linux | Linux | Linux |
| | | | | | Communication System | Microwave Link | Satellite | Satellite | Satellite | Satellite |

Current Radar Observation and Basic Specifications

| SI. | Name of Radar Station | Types | Manufactur er | Special Purpose | | • | Radar F | arameters | | |
|-----|---------------------------|--------|------------------|--------------------|--|---------------------------------|---------|-----------|-----|-----|
| 6 | Joidebpur Radar (2023) | Doplar | JRC, Japan | Meteorologi cal | Parameter | Joidevpur | RNG | COX | KHP | MLV |
| | , | | | | Antenna Diameter | 5 m | | | | |
| | | | | | | | | | | |
| | | | | | Radar Range | 400 km | | | | |
| | | | | | Radar Tower Height (These heights are up to Radom) | 262 ft | | | | |
| | | | | | Amplifier Unit | SSPA | | | | |
| | | | | | Power supply Backup system | Capacitor Bank/ Generator | | | | |
| | | | | | Tx Frequency | 2.80Ghz | | | | |
| | | | | | Pulse width | 2 us | | | | |
| | | | | | PRF | 220 Hz | | | | |
| | | | | | S min | -112 dB | | | | |
| | | | | | Tx Power | 10kw (Rated) | | | | |
| | | | | | Software | J-BIRDS | | | | |
| | | | | | OS | Linux/Wind | | | | |



MONITORING AND MAINTENANCE ORGANIZATION

Electronic and Instruments (E & I) Division is responsible for

- ✓ Radar monitoring, maintenance, troubleshooting etc.
- ✓ AWS
- ✓ Wind measuring System
- ✓ RS
- ✓ AWOS etc.



- Daily
- ✓ Weekly
- ✓ Monthly
- ✓ Semiannually
- ✓ Annually



CAPACITY DEVELOPMENT EFFORTS

Bangladesh Meteorological department is only authorized organization for weather Radar. BMD personnel monitor and maintenance the weather Radar regularly. Some efforts for capacity development are mentioned below

- ✓ OJT (On the Job Training).
- ✓ Attend foreign training.
- Adapt with new technology.
- ✓ Experience share with foreign expert.



Previous Operation Schedule

- ✓ Observations are taken every synoptic hour/Day
 - ✓ 00:00 UTC
 - ✓ 03:00 UTC
 - ✓ 06:00 UTC
 - ✓ 09:00 UTC
 - ✓ 12:00 UTC
- ✓ Upon the request from SWC/DFO (Headquarter)
- ✓ 24 hours observation is taken during abnormal condition.





Present Operation Schedule of Joidevpur radar(Gazipur)

✓ Observations are taken every 10 minutes .synoptic hour/Day



DAILY CHECK SHEET



| Klystron No. | Check | Room Tem | perature | | NDB-1 | | A | VR(20kV | (A) | A' | VR(10kV | A) | | RPMB | | | | | FW- | UPS | | | |
|--------------|-----------|-----------|----------|---------------|---------------|---------------|--------------|-------------------|---------------|--------------|-------------------|-----------------|---------------|--------------------------|------------------------|------|-------|----------------|------|------|-----------|-------|-----|
| 982 | Item | | | | INPUT | | | OUTPUT | | | OUTPUT | | | INPUT | | | Tempe | rature | | | Vibration | Meter | |
| Month/Year | 110.00 | Equipment | Backup | | Voltage | | Voltage | Cur | rent | Voltage | Cur | rent | Voltage | Cur | rent | | | | | | 1 | | 1 |
| 06/2010 | | Room | Room | R-S | S-T | R-T | | Intensity Mode | Mode | | Intensity Mode | Doppler Mode | (V) | Intensity Mode (A) | Doppler Mode (A) | FW-1 | FW-2 | - and a second | FW-4 | FW-I | FW-2 | FW·3 | FW- |
| | | (degree) | (degree) | (V) | (V) | (V) | (V) | (A) | (A) | (V) | (A) | (A) | | - | 40 | | | 00 | | | | | |
| Date/Time | Signature | 20 - 25 | 20 - 40 | 420 +/-20% | 420 +/-20% | 420 +/-20% | 220 +/-5% | 45 | 50 '+/-10% | 220 +/-5% | 2 '+/-10% | 2 +/-10% | 220 +/-10% | 35 | /+/·10% | 1 | | | | | _ | | _ |
| 17/11:121 | | | | | | | | | | | | | | | | | | | - | | | | |
| 2/ : | | | | | | | | | | | | | | | | | | | | | | | |
| 3/ : | | | | | | | | | | | | | | | | | | - | | | | | |
| 47 : | | | | | | | | | | | | | | | - | | | | | | | | - |
| 5/ : | | | | | | | | | | | | | | | - 97 | | | | - | | | | |
| 6/ : | | | | | | | | | | | | | | - | | | | | - | - | - | | - |
| 7/ | | | | | | | | | | | | - | | - | | | | | - | | | | |
| 8/ : | | | | | | | | | | | | | | | | | - | | | | | - | |
| 9/: | | | | | | | | | | | | | | | | 1000 | - | | - | | | | |
| 10/ : | | | | | | | | | | - | - | | | | | | | | | | | | |
| 11/ | | | | | | | | | | | 4 | | | | | | | | | | | | |
| 12 / : | | | | | | | | | | | | | | | - | | | | | | | | |
| 13 / : | | | | | | | - | | | | | | | - | | | | | | | | | |
| 14/ : | | | | | | | | | | | | - | | - | | | | | | | | | |
| 15/ : | | | | | - | | - | | | - | | | | | | | | | | | | | |
| 16/ : | | | | | | | - | - | | - | - | | | | | | | | | | | | |
| 17/ | | | | | | | | | _ | | | | | | | | | | | | | | |
| 18 / : | | | | | | | | | - | - | | | | | | | | | | | | | |
| 197 : | | 0000 | 32°C | 1 | 1.10 | 409 | 227 | 5.5 | 57 | 220 | 2'0 | 2'0 | 2/2 | 36 | 38 | 64 | 67 | 63 | 66 | V | V | V | 1 |
| 20 / : | | 22°C | | 415 | 412 | 387 | 227 | 55 | 57 | 220 | 2.0 | 2.0 | 213 | 36 | 38 | 68 | CC | 57 | 59 | v | ~ | ~ | 1 |
| 21/6/2010 | Solow | 22'6 | 34€ | 399 | 394 | 407 | 927 | 55 | 57 | 220 | 20 | 20 | 213 | 36 | 38 | 65 | 67 | 64 | 65 | 2 | ~ | v | 12 |
| 22/06/2010 | 272,51 | 220 | 336 | | 412 | 393 | 227 | 55 | 57 | 220 | 20 | 20 | 213 | 36 | 38 | 68 | 69 | 68 | 67 | 2 | V | ~ | 1 |
| 2316/10 | 1 1 | 21°C | 34°C. | 403 | 400 | | 227 | 55 | 57 | 220 | 2.0 | 20 | 213 | 36 | 38 | C7 | 65 | 47 | 149 | | ~ | - | - |
| 2416/10 | 4600 | 22°C | 320 | 404 | 395 | 390 | 227 | 55 | 57 | 220 | 20 | 2.0 | 213 | | 38 | 63 | 64 | 66 | 67 | 1 | ~ | - | - |
| 2516/10 | OF. | 21°C | 330 | 406 | 403 | | 227 | 55 | 57 | 220 | - | 2.0 | 213 | | 38 | 67 | 68 | 67 | 66 | v | L | - | - |
| 2616/10 | 2th | 1000000 | | | | 385 | 227 | 55 | 57 | 220 | 2-0 | 2-0 | 213 | 36 | 38 | 66 | 65 | 64 | 68 | v | V | ~ | L |
| 2716110 | Sperran | 21°e | 316 | 395 | 392 | 390 | 227 | 55 | 57 | 220 | 2'0 | 2'0 | 213 | 36 | 38 | 64 | 65 | 67 | 68 | 1 | V | ~ | L |
| 28/6/10 | MARK | 22 0 | 32(| 390 | 385 | 320 | 227 | 55 | 57 | 220 | 2:0 | 21 D | 212 | 36 | 38 | 65 | 65 | 167 | 68 | ~ | 1 | - | L |
| | Mysor. | 21°e | 310 | 383 | 383 | 374 | 227 | 55 | 57 | 22-0 | _ | 2:0 | 213 | 36 | 38 | 62 | 60 | 34 | 36 | V | ~ | V | 1 - |
| 3016110 | A482 | 1216 | 2,6 | 200 | 202 | 217 | 1 | 30 | 1 | | | | | | | | | | | | | | 1 |



DAILY CHECK SHEET

| klystron No. | Check | TRANSI | MITTER | DEHYL | RATOR | | TASK CON | TROLLER | | |
|-------------------|--------------------------|--|-------------------|--------------------|---------|-----|-------------|---------|-----------------|--------|
| 982 Month/Year | Item | Operat | ion time | Sensor | Counter | Ala | rm Indicati | on | Data Product | Note |
| JIDNE/2011 | . / | PRE HEAT (Hour) | RADIATE (Hour) | (kPa) | | ANT | TX | RX | | |
| Date/Time | Signature | | | | | | | | | |
| 1/: | \$1 Dyy 2 | 14/0) Bubbb | | | | | | | | |
| 2/ : | | | | | | | | | | |
| 3/ : | | | | | | | | | | |
| 4/ : | | | | | | A19 | | | | |
| 5/ : | | | | | | | | | | |
| 6/ | | | | | | | | | | |
| 7/ : | | | | | | | | | | |
| 8/ : | | | | | | | | | | |
| 9/ | | | | | | | | | | |
| 10/: | | | | | | | | | | |
| 11/: | | | | Provide the second | | | | | | |
| 12/ | | | | | | | | | | |
| 13/ | | | | | | | 22 2 | | | |
| 14/: | | | | | | | | | | |
| 15/ | | | | | | | | | | |
| 16 / : | | | | | | | | | | |
| 17/ : | | Parsent | 2 | a groun | 1 | | - | | | |
| 18 / | | Klesser Ro | saling To sie | ge | | | | | | |
| 19/ | allosen | 11882.2 11882.2 11892.3 118977 11907.6 | 0301.97 | 23.5 | 2801 | No | No | No. | NO | 240.14 |
| 2010600 | and and | 1189277 | 2000 | 21.5 | ORNE | No | No | No | No | α-/ / |
| 21/6/10 | 2003x | 11002.2 | 02/11/12 | 2112 | 2207 | No | No | 140 | MAG | |
| 22/6/10 | Sic | 11 90716 | 02471 | 22.8 | 2810 | u | in | a | | |
| 23/ 0//0 | 10000 | 11917.5 | 0249.3 | 26.5 | 2814 | No | No | No | No | |
| 24/6//8 | west | 11882.2 11892.7 118977 11907.6 11917.5 11927.3 11936.1 | 0251.3 | 15.7 | 2816 | No | No | No | No | A.K. |
| 25/6/10 | ario | 11936.1 | 0251.3 | 73.6 | 2820 | u | | 140 | 61 | |
| 26/6/10 | 362052 36322 35200 | 119202.1 | 0255.5 | 22.4 | 2823 | No | No | No | No | |
| 2016/10 | 233x | 11957.0 | 075715 | 25.6 | 2226 | NO | No | No | No | OR. |
| 28/6/10 | 2Bmx | 619C7.2 | 0257.5 | 255 | 2828 | No | No | NO | MO | 8te |
| 30/6/10 | Sprin | 11978.4 | 0261.17 | 71.0 | 2832 | No | No | No | No | 21 |





VVLLINE! CITECIN

SHEET

| | eck RADOME | ANT | ENNA | | ANT | ENNA (| CONTR | OLLER | | | | | DRSP | | | | |
|---------------|-------------------------|----------|-----------------|--------------|------------|------------------------|-------------|-------------|-------------------|---------------|----------------|----------------|------------|-------------|-------------|--------------|-----|
| Year | OBS Light Indication | Oper | eting lition | | Met I | er Indica OC voltag | tion e | | Rotation Speed | | - 1 | Moter Ind | licationD | C voltage | | | No |
| 2010 Month | | visually | aurally | -15V (V) | +6V (V) | +12V (V) | +15V (V) | +24V (V) | 1.5 (rpm) | +5V-RF (V) | +15V-RF (V) | -16V-RF (V) | +5V (V) | +12V (V) | -12V (V) | +24V (V) | |
| | | | | -15 +/-5% | +6 | -12 +/ 5% | +15 | +24 | 1.5 | +5 +/-5% | +16 | -15 +/-5% | +5 | +12 | +12 | +24 +/-5% | |
| 010 | nature, | OK | -1. | | 1/ | 1 | 1/ | | 1/ | 1 | | | 1/ | V | 1 | V | _ |
| 20/6/2010 | Harris OK | OK | OK | 1_ | 1 | 1 | 1 | 1 | 2 | V | | V | V | V | V | V | |
| 04/7/200 | Affair EK | 0 K | OK | V | 1 | 1 | i | 1 | V | V | 1 | V | V | V | V | V | - |
| 11/07/200 | WW OK | 06 | OK | V | 2 | V | 1 | 2 | ~ | V | ~ | V | V | V | V | V | |
| 18/07/2000 | HANN DIK | 01/2 | 0/4 | V | L | 2 | L | 1 | i | V | 1 | 1 | V | V | V | V | |
| 101 11 | Hab OK | OK | OK | 1 | - | _ | L | 1 | L | <u></u> | 1 | - | 1 | 1 | L | ~ | |
| 08/6/10 AN | took ok | OK | ok | V | ~ | V | V | V | V | 1 | 1 | V | V | ~ | 1: | 2 | |
| 08/8/10 AU | late ok | OK | OK | V | V | V | V | V | V | V | V | 1 | V | V | V | - | |
| 16/8/10 A | Har OK | OB | OK | 1 | 1 | V | 1 | L | V | V | V | 1 | V | V | V | V | - > |
| 23/8/10 A | Has ok | ok | 06 | 1 | 1 | V | 1 | ~ | ~ | 1 | V | V | V | 1 | 1 | 1 | 80 |
| | Hart obe | 064 | of | 1 | 1 | 1 | ~ | 1 | 1 | 1 | L | U | - 1 | | 1 | V | |
| 19/9/010 A | Harros | OK | OK | V | 2 | V | - | 2 | V | V | ~ | ~ | 1 | 1 | V | V | |
| 19/9/010 Al | tash ob | OK | 26 | V | i | V | V | V | V | V | V | V | V | V | V | V | |
| 269/000 | Hard Ote | OK | OK | 2 | 2 | 2 | V | V | ~ | V | V | V | V | V | V | V | , |
| 30/9/00 1 | Han OK | ok | OK | ~ | 1 | 1 | 1 | V | 2 | 1 | V | 1 | 2 | ~ | V | 1 | |
| 2019/00 PM | war ob | ok | OK | ~ | 1 | 2 | ~ | V | V | V | V | V | V | v | V | V | - |
| 111010 A | Jaf EL | | OLL | V | 1 | V | V | V | ~ | V | V | V | V | V | V | V | |
| 16 010 A | me ote | OK | obe | 2 | 1 | 1 | V | V | V | V | V | 1/ | V | V | V | V | ` |
| | ord ok | ole | OK | V | V | U | · | 1 | | V | V | V | V | V | ~ | | |
| 31/10 1 | are of | OK | 改改 | 1 | 1 | ·V | V | V | V | V | V | V | V | V | V | ~ | |







SHEET

| к | lystron Na | Check | 1000 | | | - | | | | | | | | - | | NSMITTER | | - | - | - | | 74 | | | | | T |
|------|------------|-------------|--------|---------|-------|-------|-------|--------|--------|-------|-------|-------|---------------------------------------|--|---------------------------|---------------------------------------|---------|--------------|--------------------------|--------------------------|------------------------|-----------------------------|---------------------------|--|-------------------------|----------------------------|-------|
| | 982 | _Item | | - | | _ | | | | 10 | | | | | | eter Indicati | | | | | | | | | | | |
| | Year | | | | | | DC Vi | ollago | | _ | | | KLYS | Heating | 3150 | n Coll | 201 | Pamp | | Intensi | ty Moda | | | Dapple | ee Moda | | Nete |
| | | | 127-37 | +12V-BE | -127 | +67-1 | +127 | +247-1 | +247-2 | -159 | 45V-2 | +157 | Valtage | Ourrest | Voltage | Carrons | Veltago | Current | MOD PS Voltage | MOD PS Oursens | KLY CATE Carront | POWSK METER | MOD P9 Vellage | MOD PS Consent | KLY CATH Outrest | POWER METER | |
| | Month |]] | 665 | (V) | 600 | (N) | (9) | (7) | 0.9 | 60 | (10) | 645 | (91 | 640 | 60 | CNI | 0.99 | (gA) | 6/0 | 00 | (sch) | (000m2 | 60 | 6N) | (mA) | (dBox) | 1 |
| - | | | -12 | +12 | -12 | +5 | +12 | +24 | +34 | -15 | +5 | +115 | #18 #10# #18 #10# #0.75 874 ##0 | 81.58 9K-979 21.8 ++0% KL78 9K-980 | 460 WIGS | 23.4/15% | 3.4 | lase then | 283 W SN | 15.0 +r-5% | 32-+6% | 87.0 +* 1dB | JEE +/-E/4 DELYS SACSO | 20.0 - 164 | 48 4559 | 87 E 45 14H | |
| | | | 11/5% | +1-5% | +2-0% | +/55% | -/-5% | +1-5% | 17.6% | 19:5% | 4/-6% | ***5% | +3.E+/30% BLAS 8W 881 | 27 4 ++6% | +90 +010N SLYS 59N 981 | ELYS SK 980 23 4/48 KLYS SK 981 | 40-5N | 2 p.A. | 100 1/5% | 18.0 × 5% | 12-+5% | 82.0 -+ 12H | | 20.0 + 15% | 48 47 5% | 87.0 47.148 | |
| 1 | Detro Time | Signistance | | | | | | | | | | | +5.6+/-)0% BLV8 874 882 | \$10 +6% KLYS 9N 982 | BLYS 801 168 | \$3 6/18 KL18 98 982 | 18.20 | | 280 4/38 KLYS 5/3 562 | 15.0 446% KLYS SAC382 | 13 -+6% NLVS 33*185 | 87.0 -> 12B KLYS 593.969 | 157 +554 KLYS 58:331 | 20.0 + 564 30.75.501965 | 47 6/28 KLYS 9/6/982 | 87.0 (*148 BLVS 874 960 | 8 |
| - | 46/24 | - | 1 | V | 1 | 17 | 13/ | 1/ | 1/ | | 17/ | 11/ | 5.6 | 274 | 58.0 | 220 | 32 | 6.55 | 160:2 | 150A | 320 A | 868 | 158 2 | 20'5 | 430 | 86.8 | mak |
| - | | Alian | V | 1/ | 1 | 11/ | | 11. | V | | | V | 1000 | | = restron | - | - | | | 4190000 | - | | 10 1 | 14 | 422 | 88.8 | 12. 6 |
| 02 | Hefi | 444 | V | V | V | V | 1 | | | | V | V | 56 | 37.4 | 29.0 | 22.5 | 32 | V | 1604 | 15°A | 320A | 86.8 | 1572 | 200€ | 42,74 | 69.8 | lun |
| Đ | 404 | Allet | V | V | V | L | V | V | V | V | V | V | 2.6 | 274 | 580 | 220 | 3-2 | V | 1603 | 150f | 32'0A | 8F.8 | 1572 | 260 | 4200 | 1868 | Then |
| 1 | 1/07 | Mak | V | 1 | 1 | L | V | V | V | V | V | V | 56 | 294 | 580 | 220 | 3.2 | L | 1662 | 150A | 3206 | + 86.8 | 1573 | 19'5 | 42716 | 86.8 | ALM |
| 1 | 16/31 | Alford | ~_ | V | L | 1 | ·V | 1 | ·V | V | V | V | 5.6 | 29.4 | 580 | 220 | 3'2 | 1 | 160 2 | 150A | 32-01 | 4 88.8 | 1573 | 19:5 | tramos | 86.8 | Dem |
| 2 | 517 | Alfor | 1 | L | 1/ | 1 | 1 | 1 | V | 1/ | V | V | 5.6 | 274 | 58.6 | | 315 | | 16053 | 15-0.A | 32.06 | | 7 20 . | 19'5 | Lamit | 101 - | _ |
| | | 1 | , | | l.v. | - | - | 1 | · · | - V | - | | 30 | 1 | 300 | | 0 ., | | | 10 -1 | 2000 | .00 | 17 | - (2) | | | - |
| 1 8 | 18/90 | Alan | 2 | V | ·V | 1 | 2 | V | V | V | V | V | 516 | 274 | 580 | 220 | 3119 | V | 1601 | 150A | 320A | 868 | 1574 | 19'5 | 42mf | +868 | Rem |
| 6 | 18/1 | peter | v | 2 | V | V | 1/ | V | V | V | 1/ | V | 5.6 | 27.4 | 58.0 | 220 | 315 | V | 1601 | 150h | 32.0A | 868 | 1574 | 1915 | 42 mf | 86.8 | Rem |
| 1 | 48/ | Alfred | V | 1 | 1 | L | 1 | V | V | V | V | V | 5.6 | 274 | 58.6 | 226 | 3:15 | 1/ | 1bó1 | 15.0A | 32'2 A | - | -T1 | 195 | 42 mA | 200 | Dom |
| 9 | 2/8/1 | Alle S | L | V | 1 | 1 | 1 | 1_ | 1 | V | V | 1 | 5.6 | 27'4 | 588 | 220 | | L | 1601 | 1500 | 3201 | 87.8 | 1572 | 195 | 42 mf | 100 | Ren |
| a | cleim | Albert | V | V | 1- | 1 | 1 | 9 | 1/ | 1 | 1 | 1/ | 5.6 | 274 | 58.0 | | 319 | 1 - | 1601 | 150A | 32:01 | 888 | 1576 | 19:4 | 42 mg | 4 | Den |
| 1 | -lotte | p-n. v | | | | 1 | 1 | | V | V | | - | 0 6 | -// | 29 0 | LEC | 013 | | 10-1 | 1301 | | 40.0 | 12/4 | 123 | 7 | | 10.0 |
| 020 | 6191 | Aller | - | -1 | V | 1 | V | 1 | V | V | V | V | 5.6 | 274 | 580 | 220 | 315 | L | -1607 | 150P | 3200 | T 88.8 | 1533 | 19'5 | 42mf | 88.8 | Pen |
| 10 1 | 2/9/ | Hopen | 1 | 1 | 1 | 1 | 1 | ·V | V | V | V | V | 5'6 | 274 | 58.0 | | 31 | V | 160.1 | 150A | 3201 | 1 88.8 | - 157 | 19.5 | 42008 | 4 88.8 | Rem |
| 000 | 16191 | PHENE | V | し | V | V | 1 | V | V | V | V | V | 5.6 | 274 | 58.0 | 210 | 3-1 | 2 | 1600 | (50A) | 32'0m | A 868 | 1573 | 175 | 42mA | 87.8 | Ros |
| | 300 | Alfra | V | 2 | V | V | V | V | V | 1 | V | V | 516 | 274 | | | 31 | 1 | 1600 | 1570 A | 32'or | A 868 | | 195 | Gent | 88.K | Rem |
| | - 1 | 0. | 0.5 | | - | - | | | · r | · · | - | * | 20 | - / | | - | ~_!_ | - | 10-0 | 1001 | | | 1 | ,-, | , | | |
| 4 | High. | Atta | 1 | L | V | V | V | V | V | V | V | V | 56 | 274 | 58:0 | 22'0 | 31 | V | 1600 | 15.6P | 32°04 | A 86.8 | 157'9 | 195 | 92mt | 88.8 | Remo |
| 1 | 1/10 | Allan | V | V | V | V | V | V | V | V | V | V | 54 | 27'4 | 580 | 22.0 | 311 | V | 1600 | 150A | 32'0m | 4 86.8 | 1573 | | Lona | | Rem |
| 1 | | OHER | - L | L | V | 1 | V | V | V | V | V | V | 5% | 276 | 580 | 220 | 31 | V | 1600 | 150A | 320 W | 1868 | 1573 | 0'5 | 42mf | | Ren |
| 1 | | DALINA | ·V | V | V | v | V | i | V | V | v | V | 5% | 254 | 38% | 220 | 31 | V | 1600 | 157 P | 32:0H | A 868 | 1573 | 175 | 4200 | 98.8 | Ren |
| | 110 | Alles | V | V | 11 | 1 | 11 | 1 | 10 | 5 | 1 | V | 56 | 276 | 580 | 220 | 31 | V | 1600 | 15-04 | 32'0m | - | 1573 | de la constante de la constant | Q2mft | 88.88 | Rom |





MONTHLY CHEEK SHEET

| Klystron No. | Check | | | | TRA | NSMITTE | R/ATU | | | | | DRS | SP | | DEHYDRATOR | |
|--------------|------------------------|-----------|--------|----------------|-------------------------|---------|----------------|--------------------|------------------|----------------------------------|-------------------------|----------------------|---------------------------|--------------------------|------------------------------|----------------------|
| | Item | | I | ntensity Mo | ode | | Doppler Mo | de | Power | | | | | IF | | |
| | | Frequency | PRF | Pulse Width | Transmit Power | PRF | Pulse Width | Transmit Power | Meter Zeroing | Aging (for Spare Klystron) | Smin | Dynamic Range | ZCAL | Signal Level Check | Silica gel Color Check | Note |
| | Hina I | (MHz) | (Hz) | (µs) | (kW) | (Hz) | (µв) | (kW) | Street | 123 | (dBm) | (dB) | (dB) | (dB) | | |
| 982 | Personal Difference | 2850 | 320 | 2.0 | 500 | 720 | 1.0 | 500 | | | -120 | 90 | Long -42.79dB Short | 6 | | W 31-341 07-97-03 |
| Month/Date | Signature | +/-5MHz | +/-10% | +20%,-0% | +/-10% | +/-10% | +20%,-0% | +/-10% | | | More than ·110dBm | More than 80dB | -37.18dB | +/-1dB | | |
| an / | | | | | n-live | | | HILL | | | | | | | | |
| eb / | | | | | | | | | | 5.7 | | | | | | |
| far / | | | | | | | | 100 | | 7 | 1110 | 1 141 | | | | |
| pr/ | | | | | | | | | | 7 | | | | | | |
| fay/ | | | | | | | | (en) | | | | | | | | |
| un/ | | | | | | | | THE REAL PROPERTY. | | | | | | 1279 | | |
| ui / ac 10 | | 2849.88 | 3265 | 5,08 | 8682W 478KW | 71542 | 1.0.7 | 8674 472KW | done | . 980 | -1231 | -81.21 | -4073 | 6'2 | Checked: | |
| | | 2849'87 | -3205 | 2.08 | 86.7 420KW | 719.43 | | 86.7/10 | -done | 981 | -122] | -81:5 | -41.32 | 6:45 | | |
| ep /20/b | Alfaolin | 284988 | 3265 | 2.08 | 470KW 470KW 486KW | 71942 | -1'08 | 86.7 WW | - Ine | 979 | -1231 | 81.54 | - 35.53 - 35.53 | 6.40 | OK checked. | 0 |
| ct / 20[0 f | Hoslin. | 2849'87 | | aral. | 86'894BN | | 1 7 | 485KW | done | 980 | -1221 | -81.60 | -41:46 | 6.3 | OK diedred | <i>a</i> , _ |
| ov/2010 | | | | 2'04 | 490 KW 1 483 KW | 71942 | 1.00 | 477KW. | done | 981 | -1221 | -81:52 | 41.37 | 625 | OK checked. | 7 |
| ec/ 2010 | Affeder | 284788 | 3203 | 2.08 18 | 165KW | 71942 | 1.08 | 86'6 457KW | done | 979 | -122.1 | 81'52 | 4018 | 63 | 606 checked | * |





SEMIANUALLY CHEEK SHEET

| Klystron No. | Check | | | Maria de | 1 | NTENN | 1 | | | | | RADOM | E | ANTENNA | ANTEN | INA CONTI | ROLLER | | TRANSM | HTTER/AT | ru | Series . | DRSP | | |
|-----------------|-----------|--------------------------------------|--------------|----------------|--------------|-------|--------------|----------------|--------------|------|------------------|------------|------------------|-------------------|------------------------|------------------------|---------------|-------------------------|--------------|----------|----------------------|----------|--------------------------|--------------------------|------|
| 982 | Item | Check | | EL S | ection | | | AZ Se | ection | | 1 | /iweing Cl | neck | | Pos | ition | Cleaning | Klystron | Tank | Cleaning | Power | Cleaning | STALO | соно | |
| | | or Cleannig Slip-ring Brush | Oil Level | Oil Leaking | Oil Color | Belt | Oil Level | Oil Leaking | Oil Color | Belt | Internal View | | Base Caulking | Replace Grease | EL | AZ | Air Filter | Input Level (dBm) | oil Level | Air | Meter Calibration | Air | Output Level (dBm) | Output Level (dBm) | Note |
| Date/Month/Year | Signature | | 1 | 1 | | | | | | | 1 | | | | less than 0.1degree | less than 0.1degree | | 33dBm +/-1dB | | | | | 3.5 +/· 1dB | ·0.2 +/-1dB | |
| 14/12/2010 | Alles | V | v | No | ok | 2.8 | V | No | OK | 9.78 | V | ok | oh | oh | OK | - | 0/01 | 33 | | V | V | V | 3.6 | -43 | |
| 14 tractor in | 1,5 | | | 1,0 | | | | | , | | | | | | 1 | | - | | | | | | | | |
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ANUALLY CHECK SHEET

| Klystron No. | Check | FW | UPS | | | ANTENNA | | | Transmitter/ATU | |
|--------------------------|-----------|--------------------|----------------|--------------------|----------------------|-------------------------------------|-------------------------------------|-------------------------------|---------------------|------|
| | Item | Pivot | | Oil R | eplace | S | witch Operati | on | | |
| 982 | | Bearing Replace | Oil Replace | Azimuth Section | Elevation Section | 1st Limit Operation (degrees) | 2nd Limit Operation (degrees) | Safety Switch Operation | Klystron Replace | Note |
| Date/Month/Year | Signature | | | | | Lower :-4 Upper:+92 | Lower:-6 Upper:+94 | | | |
| 22/01/2011 | Hoolin | 22/01/201 | 22/1/2011 | alcalised | Diedica | - | | | | |
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PREVIOUS RADAR PRODUCTS

- Raw products: 03
 - ✓ Intensity
 - ✓ Doppler Velocity
 - ✓ Spectrum Width
- ✓ Various Products:
 - ✓ PPI
 - ✓ CAPPI
 - ✓ VVP
 - ✓ RTI
 - ✓ SRI
 - ✓ BASE
 - ✓ MAX
 - ✓ HMAX
 - ✓ RAIN ETC.





DATA PROCESSING

Meteorologist are responsible for

- ✓ Receiving data.
- ✓ Processing the weather radar data.
- ✓ Analyzing those data
- ✓ Prepare nowcast, warning etc.
- ✓ Dissemination.





- ✓ Northern composite (RNG and KHP radar)
- ✓ Southern Composite (MLV and COX radar)
- ✓ Central Composite (All)
 At present composite work is not woking.



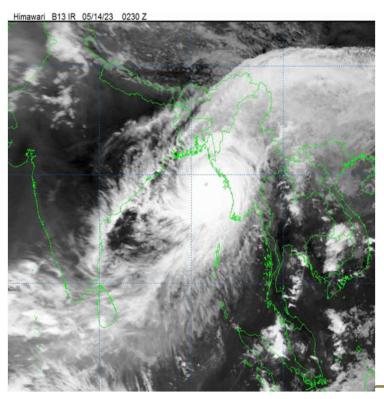
- Nowcast
- Cyclone warning
- ✓ Thunder lightning (EES)
- ✓ Rainfall (real time)
- ✓ Flash Flood warning
- ✓ Wind Speed and Direction

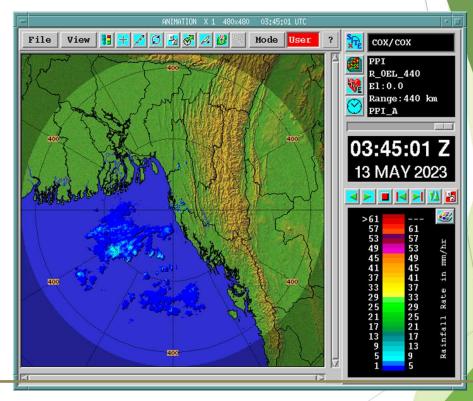




CYCLONE MOKHA COVERED BY COX RADAR









- ✓ Lacking of Spare parts
- ✓ Lacking of skilled Manpower
- No institutional training
- ✓ Old age radar





FUTURE PLAN

- Established New radar
- ✓ More Accurate Observation
- ✓ Data communication platform
- ✓ Skilled Manpower
- Adequate training
- Continuous supply chain of spare parts
- ✓ Data QC





ISSUES

- ✓ Proposal for new radar (SSPA, Dual polarization)
- Radar training for capacity building
- ✓ Joining to radar network.
- ✓ Data/Information exchange
- ✓ Training on Operation, maintenance and troubleshooting



QUESTION & ANSWER





