

# TELECOMMUNICATIONS

Analog EPABX System	2
Digital EPABX System	3
Intrinsically Gain Flattened Erbium Doped Fibre Amplifier (EDFA)	4
Indoor/Outdoor GSM and CDMA Repeater Equipment	4
Commercial Antennas	5
Antennas for Defence	6
Microwave Circuits	6
Single Channel Radio Telephone System	7
Digital Microwave Radio	7
Digital Multiplex Radio System	8
C -Band VSAT Transreceivers	9

# Analog EPABX System

## Description

Mascot have developed the EPABX to cater to the requirements of a house, small office and big corporate.

The most unique feature of this is the Z-80 based microprocessor that is programmed with CMOS cross point switching. It acquires faster access to the operation aimed for and reliably.

The system offers standard features like

- Extn. to extn. call, call transfer, call pick up, call hold, auto call back extn. as well as P & T, conference-5 party extn., Direct outward dialing, personal memory bank, barge in with/without tone, extension privacy, cal camp on, call parking, do not disturb, hot line, wake up alarm, optional reservation of incoming and outgoing calls, trunk groups, hot outward dialing, trunk queuing, last number redial, programming retention, tone/pulse compatible, music on hold with extra jack input, remote programming, dynamic locking, 94/95/98 locking facility, low battery cut off, auto day night mode rtc based, wall mountable, master copy of data in nv ram, extension status display, intercom CLI if CLI instrument is connected on extension, forced to release - P&T/ extn. and call disconnecter etc

In addition to the above mentioned standard feature, the special advance features are:

- CLI facility on transfer of CLI
- Auto call transfer CLI based
- Additional features of CLI series (advanced)
- Voice guided DID(separate message) printer port parallel type Serial Port RS 232
- Door phone interface
- Fax tone detection on DID DOSA unrestricted as well as restricted door lock-switching relay auto redial 99 times
- Remote display (optional)
- Incoming & missed call printout
- CLI facility on transfer of CLI
- Auto call transfer CLI based

## Advantages

The analog EPABX systems are exceptionally user friendly, feature rich systems that are specially designed for markets that are "cost conscious" and those who are "first time users " of EPABX.

These systems provide high performance telephony features for small and medium size organisations. Ease of operation and compactness of design makes it an ideal choice for both Business and home users. These systems are modularly expandable and provide the unique ability to grow with the growth of the organisation.

It is an in-house research and development of Mascot.

## Application

The Analog system finds application in offices, small office home office segment (soho), motels, business centers, hospitals, flats, homes and bungalows.

## Target countries

All countries, specially developing countries.

## Collaboration Options

Marketing and Sales Agreement

## Organisation

Mascot Office Systems Ltd.

## Specifications

Technology	Microcontroller based stored program control technique CMOS cross point switching
Longitudinal Balance	60 db
Extension Loop resistance	600 ohm

### Insertion Loss

A)	Less than 2 db at 1 KHz
B)	Less than 1 db at 1 KHz
Dial Speed	10 + 0.5 PPS
Cross Talk Attenuation	Not less than - 70db
Break Ratio	33:66
Input Power	230V AC + 10% 50Hz

(cntd...)

# Digital EPABX System

## Description

The Digital EPABX system developed by Mascot is based on the Digital PCM/TDM-Distributed Architecture Technology providing high powered communication support to any size of business.

It can be interfaced with the requirements of modern business activities and is duly supported by prompt after sales service.

The system offers standard features like

- 100% non blocking abbreviated dialing, audio level adjustment, boss secretary system, battery backup, brokers call, call transfer, call back on busy extension/trunk, call consult, call forwarding, call parking, call pick-up, call privacy, conference-3/8 party, call disconnecting setting, call duration, warning tone, call budgeting, choice of printout, CLI on analog extn, day/night mode setting, emergency call, external call, enter own supervisory mode, internal call, master cancellation, mini email, music on hold external connectivity, name/dial number display, one touch keys, on line advice of call charge, paging(internal/external), personal passcode, public hold, personal memory bank, private line, queued call, redial, remote programming, speakerphone, SMDR/ASMDR printing, set self alarm, setting of STD/ISD/group codes for call charges etc.

In addition to the above mentioned standard feature, the special advance features are:

- New generation Digital EPABX with 64 Kbps Internet Access from extension. It offers a 1.5 MB download capability on ADSL extensions. It has Ethernet connectivity for high speed integration and offers ATM card to connect to ATM cloud
- CTI: Computer Technology Integration; CLI- Calling Number Integration; DNI- Dialing Number Integration
- ACD- Automatic Call Distribution for Call-Centres
- Virtual Telephony
- Multi-Level Voice Guidance 7 Type
- Networking
- Video Conferencing through RBl

## Advantages

The Digital EPABX is an economical communication solution which is truly expandable (40-1000 ports). It offers wide selectable friendly features including some values added options. It provides flexible connectivity for line phones.

It is an in-house research and development of Mascot.

## Application

The Digital EPABX is a highly versatile system, which can cater to the varied communication requirements of a business center, hospital or large corporate organisations.

## Target countries

All countries

## Collaboration Options

Marketing and Sales Agreement

## Organisation

Mascot Office Systems Ltd.

## Specifications

Models	Dial X-S	Dial X-M	Dial X-L	Dial X-XL
Ports	72	120	248	504
Dimensions (Inches)	14x12x12	18x12x12	18x12x30	32x17.5x63
Operative Voltage	220V AC ± 10% 50 Hz/ 100 W (Maximum Load)			
Battery Back-up (Volts)	24/48	24/48	24/48	24/48
Junction Loop Resistance	1200 ohm	1200 ohm	1200 ohm	1200 ohm
Extn Loop Resistance	150 ohm	150 ohm	150 ohm	150 ohm
Insertion Loss	< 1db	< 1db	< 1db	< 1db
Dialing Speed	10± 1pps	10± 1pps	10± 1pps	10± 1pps
Temperature	0-40°C	0-40°C	0-40°C	0-40°C
Humidity	20%-80% RH	20%-80% RH	20%-80% RH	20%-80% RH
Control	16/32 Bit Processing Power			
Ringer Voltage	75V AC, 20 Hz	75V AC, 20 Hz	75V AC, 20 Hz	75V AC, 20 Hz
Program Storage	EPROM, Flash EPROM, RAM, Diskette			
Switching Technology	Digital PCM/TDM	Digital PCM/TDM	Digital PCM/TDM	Digital PCM/TDM

# Intrinsically Gain Flattened Erbium Doped Fibre Amplifier (EDFA)

## Description

Erbium doped fiber amplifiers (EDFA) have truly revolutionised fiber optic communication and have been responsible for the practical realisation of multi-terabit per second communication by using the technology of Dense Wavelength Division Multiplexing (DWDM). DWDM systems require gain flattened amplifiers which are realised using external wavelength filters. This leads to additional loss and makes the system complex. In order to overcome these shortcomings and to achieve intrinsically gain flattening, suitable modifications in refractive index profiles and doping profile have been incorporated in the newly developed system.

The device basically a fiber has a staircase profile consisting of an inner core which a relatively large  $\text{\AA}$  followed by outer concentric depressed core of smaller  $\text{\AA}$  followed by cladding. The parameters of the fiber are so designed that for a wavelength below a specified limit most of the signal power is in the inner core and beyond that the fractional signal power in the outer core increases. By selective doping the outer core and also a part of the outer cladding the gain spectrum is modified. The gain is less for wavelength below a specified limit as compared to conventional EDFA while it is higher for wavelength greater than said limit. This results in flattening of gain spectrum.

## Advantages

The device is simple and achieves gain flattening intrinsically. Introduction of staircase profile is capable of providing flat gain over a wave length span of approximately 34nm. It produces EDFA having high optical gain and wide bandwidth for use in broadband WDM optical system.

The technology is patented under Indian Patent Application no. 924/DEL/2002 dated 12.9.2002.

## Applications

Intrinsically gain flattened EDFA finds application in optical communication and wavelength flattened attenuators.

## Target Countries

All countries

## Collaboration Options

Technology Transfer and Consultancy Service

## Organisation

Indian Institute of Technology, Delhi

# Indoor/Outdoor GSM and CDMA Repeater Equipment

## Description

Repeaters provide radio frequency (RF) coverage to areas, which either lack signal, or the required signal strength for adequate mobile phone performance. The various types of GSM/CDMA Repeaters for cellular and Fixed line operators are Indoor/Outdoor Band Selective, Channel Selective, Frequency Converter, Optical Fibre, In Building Solution and Booster.

The Repeater equipment developed in-house by Shyam Telecom, is of unique nature to enhance the coverage of mobile range within and outside the buildings.

The product offers solution for enhancing the range of BTS and also specialised solution for indoor coverage. The product also offers plug-in type Indoor Repeater model which is based on its unique adaptive algorithm where system gain is controlled automatically.

The product is supplier independent and covers the entire spectrum, Shyam has developed repeaters for both GSM and CDMA Technology. With the help of this product, the service providers can enhance the quality of the network and optimise the capital resource.

## Advantages

The technology developed by Shyam has several unique features. This includes:

- Increased dedicated and integrated solutions for service operators
- Automatic power control
- Built-in spurious detection
- Local and remote NMS
- Increases coverage simply and economically
- Ensures no hand-off
- Reduces other cell interference
- Meets the requirement of multi-operators' non-contiguous frequency spectrum

## Applications

The product offers solution for enhancing the range of BTS and also specialised solution for indoor coverage. These repeaters are used to create effects on traffic distribution in large buildings like office buildings, shop malls, departmental stores, subway stations etc. It also enhances the quality-service for in-building shadowed locations and degraded voice quality areas.

## Target countries

African, Asian, European and South American Countries, USA and Canada.

## Collaboration Options

Joint Venture, Information Exchange, Marketing, Distribution and Agency Agreements

## Organisation

Shyam Telecom Limited

(contd...)

## Specifications

Shyam Telecom has a whole range of products which give integrated and dedicated solutions for different operators and are flexible for future enhancement. Products are broadly categorised based on the applications as mentioned below:

- Indoor/outdoor repeater
- GSM/CDMA repeater
- Channel selective/Band selective repeater
- Narrow band/Wide band repeater
- Upto 3 sub bands selective repeater (for non-contiguous band)
- Upto 4 sub bands selective of dual band (GSM 900 and 1800 MHz)
- Optical repeater to extend coverage upto 20km
- Dual band (GSM 900 & 1800) optical repeater

Shyam Repeaters will help the operators to expand their network and increase the coverage area economically. The product will increase competitiveness both technology-wise and cost-wise in India and abroad.

The cost of the Technology including Operating Cost is approx 10.00 Crores

## Commercial Antennas

### Description

Commercial Antennas are designed and manufactured for directional, bi-directional and omni-directional applications. These antennas can have gain of 2 DB, 8 DB, 12 DB, 15 DB and 18 DB etc. These antennas can be designed for custom applications as well. Antennas available could have linear, circular and dual polarisation.

There are different types of antennas designed includes:

- Monopole, Dipole, Microstrip (Patch Panel), Yagi-Uda, Log-Periodic, Horn and Reflector Antennas and Antenna Arrays.

These Antennas are designed, fabricated and tested with state-of-art equipment and software. Environmental testing is also done to judge the effect of temperature variation, wind effect etc.

### Advantages

The commercial antennas have following advantages:

- Custom designs are available
- Economical
- Aesthetically superior
- Short delivery time (Time taken from order to delivery)
- Indigenous designs
- Precision of upto 20 microns

### Applications

These antennas find application in WLL (CDMA), GSM, GPS, Blue tooth, Cordect, Wireless LAN systems.

### Target countries

All countries

### Collaboration Options

Licensing, Marketing, Service and Support Agreements

### Organisation

Indian Institute of Technology, Bombay

## Antennas for Defence

### Description

Defence antennas are broadband antennas designed and manufactured from HF (3 to 30 MHz) to millimeter wave (35 GHz).

There are different types of antennas that are designed includes:

- Broadband Monopole, Loop-Periodic and Reflector Antennas.

These Antennas are designed, fabricated and tested with state-of-art equipment and software. Environmental testing is also done to judge the effect of temperature variation, wind effect etc.

### Advantages

The commercial antennas have following advantages:

- Custom designs are available
- Economical
- Aesthetically superior
- Short delivery time (Time taken from order to delivery)
- Indigenous designs
- Precision of upto 20 microns

### Applications

These antennas are used for:

- Direction Finding (DF) systems
- NVIS
- Air borne applications
- Unmanned Aerial Vehicle (UAV)
- Satellite communication
- Microstrip Antenna Arrays for conformal/ flush applications.

### Target countries

All countries

### Collaboration Options

Licensing, Marketing, Service and Support Agreements.

### Organisation

Indian Institute of Technology, Bombay

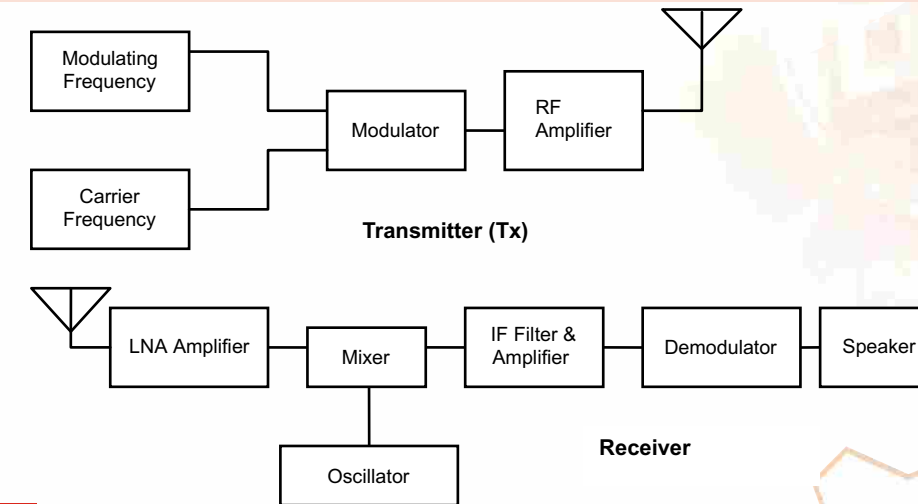
## Microwave Circuits

### Description

Microwave Circuits consists of power dividers/combiners, couplers, filters, attenuators, amplifiers (low noise and power), oscillators, mixers and phase shifters.

They are designed for any frequency range starting from HF to mm waves.

These circuits are needed for any transmitter (back end) or receiver (front end).



### Advantages

The commercial antennas have following advantages:

- Custom designs are available
- Economical
- Aesthetically superior
- Short delivery time (Time taken from order to delivery)
- Indigenous designs

### Applications

These antennas are used for:

- WLL, GSM mobile phones
- Wireless LAN
- Wireless communication for transmitting and receiving voice, data and video
- RF energy meter
- RFID

### Target countries

All countries

### Collaboration Options

Licensing, Marketing, Service and Support Agreements.

### Organisation

Indian Institute of Technology, Bombay

# Single Channel Radio Telephone System

## Description

Access Phone from Shyam Telecom can extend telephone connection to as far as 30-50 km (line of site transmission) from the termination of an existing telephone connection. It is the most advanced, economical and easy to install radio access system to extend ordinary telephone connection to remote areas such as villages, suburbs, farm houses, oil refineries, construction sites where no telephone lines are available from exchange for establishing emergency services etc.

## Advantages

The RT 100 Series from Shyam integrates with and extends existing telephone networks to remote areas or where there is need for temporary or emergency communication facility.

Some of the design features make it simpler to configure and monitor performance than some conventional and more costly equipment. It has been designed to be easy to install and customise with its extensive plug-in options and user friendly setup program.

Benefits of the advanced design concept are:

- Several power supply options are available like AC Mains and a range of DC supplies including battery backed solar panels or wind generator
- Extremely low power consumption, offering unprecedented efficiency necessary for solar power applications
- Wider telephony bandwidth for improved aural and data performance on single channel units
- Universal model with complete user configurability allows large reduction in stores inventory
- Advanced system architecture guarantees easy expansion to suit current and future needs
- Comprehensive telecommunications interface options offer complete network compatibility
- Flexibility of indoor mounting options for wall, shelf or rack
- Weatherproof housings are available for outdoor wall or post mounting

## Application

It has the following applications:

- Fixed Subscriber Station: The fixed subscriber station consists of a terminal, AC/DC power supply or solar power, a directional Yagi antenna and the cable to connect the terminal to antenna. Any kind of telephone (DTMF/ Decadic), Fax, Modem or coin box type telephone can be connected. For outdoor mounting a separate box is available
- Mobile Subscriber: The mobile subscriber is the same as fixed subscriber with added accessories for mounting in car, truck etc. DC Power is supplied from the car battery and the antenna is mounted on the roof of the car. The handset is supplied with various functions like dial number display, last number redial, electronic lock, 9 nos. memories, signal level, out of range, busy indicator. Hands free kit is also available
- Portable subscriber: The portable unit is of hand carry design in a fibre case with built in telescopic antenna and handset. It operates from its own 12V battery and if required can be powered from car battery also. It has same facilities as the mobile unit

## Target countries

African, Asian, European and South American Countries, USA and Canada.

## Collaboration Options

Joint Venture, Information Exchange, Marketing, Distribution and Agency Agreements

## Organisation

Shyam Telecom Limited

## Specifications

Unique features of the system are:

- Fixed, Mobile and Portable Subscriber telephone stations
  - Most upto date design using ASIC, Digital technology, PLL Synthesiser
  - Field proven digital signaling system
  - Fax and data terminal connectable
  - High quality voice with compander
  - Polarity reversal, 12/16 KHz metering for coin box
  - Digital Scrambler (optional)
  - Meets P.T.T specifications
  - Available in VHF, UHF bands
- Other details available on request

# Digital Microwave Radio

## Description

Shyam Microwave/UHF equipment is one of the most advanced state-of-the-art equipment. It is specially designed for small and medium capacity digital transmission.

The systems are available in wide range of CCIR standard frequency ranging from 400 to 2.3GHz and in hierarchical steps of CCITT standard 704Kb, 2 and 8MB transmission capacities. The equipment for 4x2MB interface circuits is also available.

## Advantages

The system has following advantages:

- A family of products with significant commonality minimises demands for spares
- A complete digital trunk radio system, including radios, protection and supervisory equipment
- Comprehensive maintenance features for operational effectiveness and minimum outages
- Modularity gives simple installation and expandability
- Manufactured in India with state-of-art technology

## Application

It has the following applications:

- General terrestrial microwave link
- Transportable radio for relief operation
- Cellular base station, access radio
- Point-to-point low and medium capacity digital microwave system for transmission of digitized voice, data, video and facsimile
- Well suited for rural communication
- Last mile connections for LANs, MANs and WANs

## Target countries

African, Asian, European and South American Countries, USA and Canada.

## Collaboration Options

Joint Venture, Information Exchange, Marketing, Distribution and Agency Agreements

## Organisation

Shyam Telecom Limited

## Specifications

System Parameters	10 CH. (DR10)	30 CH. (DR30)	4X30CH. (DRM 120)	120 CH. (DR120)
Data Rate	704 Kb/s	2.048Mb/s	4x2.048Mb/s	8.448 Mb/s
Line Data Rate	768 Kb/s	2.112 Mb/s	8.512 Mb/s	8.512 Mb/s
Inld Order MUX	-	-	Part of Radio	-
Adjacent Channel Spacing (R.F)	1 MHz	2.5 MHz	7.0 MHz	7.0 MHz
Threshold ( at BER 1 X 10 <sup>-3</sup> )	(Min)	(Min)	(Min)	(Min)
R.F. Frequency	As per customer requirement			
	As per CCIR in 400, 600, 900, 1500 and 2000 MHz Bands			
	or As per customer requirement			
Data Interface	As per CCITT G 703			
Jitter Tolerance	As per CCITT G 823			
Quality Performance	As per CCITT G 821			
Interface towards MUX	75 ohms/ 120 ohms			
Input Supply Voltage	-48V ± 15%			
Power Consumption	110 watts (approx.)			

# Digital Multiplex Radio System

## Description

The 10 channel digital multiplex radio-telephone system from Shyam Telecom is an economical way to implement digital radio communication in the 400 MHz, 600 MHz, 900 MHz, 1.5 GHz and 2 GHz frequency bands.

Since it uses digital transmission, it has a high-quality communication capability that allows connection to a variety of terminals and telephone switching systems. It not only has a positive ROI but also provides excellent service in the future.

10-channel digital multiplex radio-telephone equipment has a built in flexibility necessary to grow with the communication requirements.

## Advantages

Benefits of the system are:

- Simple circuit configuration makes the equipment immune to noise and other type of interferences
- Modular construction allows simplified troubleshooting and reduced downtime
- The equipment consumes low power enabling it to be powered by solar battery. This allows sophisticated communication to be extended in remote areas
- Various units allowing data to be transmitted from various equipments are available. With this, not only along telephone signals but also data signals can be transmitted for wider application

## Application

The Radio System has following usage:

- To connect rural exchange to city exchange
- Mixed use for extending 10 hot line, fax, data, coin telephones to remote areas
- To connect branch, factory, site office to city office.
- Extension of C.O. lines to resorts, hotels, camp sites, emergency connections
- Railway network

## Target countries

African, Asian, European and South American Countries, USA and Canada.

## Collaboration Options

Joint Venture, Information Exchange, Marketing, Distribution and Agency Agreements.

## Organisation

Shyam Telecom Limited

## Specifications

### General

Input Voltage	-48V ± 15%
	Other inputs are also available with optional power supply units.
Power Consumption	90W approximately in case of DC-48V input (10 channels mounted)
Temperature range	0 to 50°C
Stable Operating Range	-5 to +55°C
Humidity Range	Less than 95% at 35°C
Dimensions	424 (W) x 350 (H) x 425 (D) mm
Weight	25kg (approx)
Transmission Capacity	10 telephone channels 1 order-wire channel 1.8 kb data channel for customer use 5.1 kb independent data channels for customer use
Alarm Information	Visual and audible alarms

### Repeater System/ Repeater Units

Method	Regenerative repeater system (back to back connection)
I/O data bit rate	704 kbit/sec
I/O clock frequency	64 KHz
Signal Method	CCITT Rec. V.11 (RS-442)
Connection Method	25-pin D-sub miniature connector

(cntd...)



# C-Band VSAT Transreceivers

## Description

Shyam SAT series of C band transreceivers are available with transmitter output levels of 2, 5, 10 and 20 watts. These transreceivers are ruggedly built for continuous outdoor duty in all types of environments. They are suitable for SCPC, MCPC and DAMA applications.

The transreceivers integrate all necessary functions into a small outdoor package which is designed to give a highly reliable service in a wide range of environments and functions.

## Advantages

The key features and benefits of the system are:

- It is small, light weight and easy to install
- No indoor equipment is needed
- Has built in test facilities for improved maintainability and reduced dependence on external test equipment
- It is compliant with relevant CCITT and CCIR recommendations as well as Intelsat specifications
- It is a frequency agile radio equipment, completely independent Tx and Rx frequency selection

## Application

The transreceivers find application in:

- Rural telecommunications expansion
- Industrial networking
- LAN and WAN extensions
- Emergency Link restoration
- Remote surveillance
- Broadcast
- Data distribution and collection
- Point-of-sales systems
- Video teleconferencing
- Conventional voice application

## Target countries

African, Asian, European and South American Countries, USA and Canada.

## Collaboration Options

Joint Venture, Information Exchange, Marketing, Distribution and Agency Agreements

## Organisation

Shyam Telecom Limited

## Specifications

Parameters	Specifications
<b>System</b>	
Ports	2 RS-232, or RS-232 and 1 RS-485
Protocol	RS-232 port supports any "dumb terminal" RS-485 port supports addressed packetised data per system
Alarm Relays	SMS software specification for M&C for Major and MINOR alarms
Visual Indicators	Green LED indicated power is active Red LED indicated a summary alarm
Power	95 to 250 VAC; 50-60 Hz (Universal) Optional: +12V/-24V/-48V DC
<b>Environmental</b>	
Temperature	-30 to + 55°C operational -60 to + 75 °C storage
Altitude	5000 m/max
Rain	50 mm/sq inch per hour
Wind	240 km/150 miles per hour
Vibration	1.0g random operational 2.5g random survival 10g operational 40g survival