TECHNOLOGY TRANSFER OPPORTUNITIES

COMMUNICATIONS RESEARCH CENTRE
OTTAWA, ONTARIO

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OTTAWA, ONTARIO

TECHNOLOGY TRANSFER OFFICE
(TEL. 613-991-3313)
(FAX 613-998-3185)

(UNDER REVISION JAN 93)

OVERVIEW OF CRC

The Communications Research Centre (CRC) is the Department of Communication's major research facility located at Shirleys Bay in Ottawa. It currently has a staff of over 200 engineers and scientists supported by more than 50 technologists. CRC has collaborative R&D arrangements with over two dozen research organizations in North America and Europe. Its major clients include federal government departments, universities and private industry. With an annual budget of nearly $50 million, it conducts leading-edge research in key areas such as:

- *wireless & mobile communications*
- *modulation, coding & multiple access*
- *broadcast technologies*
- *microwave & digital integrated circuits*
- *radio propagation and prediction*
- *gallium-arsenide semiconductors*
- *advanced TV and sound*
- *optical communications*
- *personal communications*
- *MSAT application-specific services*

RESPONSIVE TECHNOLOGY TRANSFER PROGRAM

CRC's Technology Transfer Office (TTO) can respond quickly to negotiate a licensing agreement or arrange a collaborative project. We can also brief you on the latest technologies and help you access industrial development programs. The TTO is part of NRC's IRAP network and has access to program funding to help you develop new and competitive products. Since TTO is often called upon to provide technical assessment for communications projects submitted to other major government programs, maybe you should start planning your project with CRC in mind.

For more information, call us at 613-991-3313 or better still, send us a fax at 613-998-3185 with your request along with a profile of your company. This will help us find the appropriate technologies for you. Details of our unique facilities and technologies follow:

PART ONE: CRC UNIQUE FACILITIES

PART TWO: LIST OF TECHNOLOGIES

PART ONE: CRC UNIQUE FACILITIES

LIST OF CRC UNIQUE FACILITIES

1. Satellite Communications Test Facility - Mobile
2. Satellit Communications Test Facility - Fixed
3. Satellite Link Simulation Package (CRC Linksim)
4. MSAT-LX Mobile Terminal
5. Earth Terminal - L-band Mobile Terminal Propagation Simulator
6. Radio Channel Impulse Response Measurement System (UHF/EHF)
7. Radio Coverage Measurement System
8. Elevated Ground Screen Facility for test and measurement of antenna impedance and gain
9. Large Antenna Array Simulator (2.45, 5.8 and 35 G hz)
10. Natural Language Multimedia Facility
11. Digital Video Signal Processing Facility
12. Test Bed for Adaptive-Interference Cancellation Techniques Using Antenna Arrays in Communications Systems
13. Advanced Television Evaluation Laboratory
14. Microelectronics Facility
15. High Speed (GaAs) Digital Test Bed
16. Advanced Material and Device Analysis Laboratory
17. Reliability Test Laboratory
18. Microwave Component Test and Development Facility
19. Microwave Circuit Design, Analysis and Optimization CAE/CAD Facility
20. Broadcast Transmission Test Facility
21. Optical Communications Facility
22. Audio Listening Laboratory with Support Facilities
23. Microwave Power Transmission Range
24. Human Visual Communications Lab

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PART TWO: LIST OF TECHNOLOGIES

LIST OF TECHNOLOGIES

CASE NO.	TITLE
07102	Dual Slope Radiometer
07145	Spectrum Shaping Microwave Digital Modulator
07316	Analog Voice Privacy Device
07680	Optoelectronic Compound Switching Matrix
07704	VHF/UHF Computer Prediction Program & Terrain Data Base
07705	500 Metre Digital Terrain Data Base
07797	Optical Mixing/Demixing Device
07849	Hybrid Monolithic Interconnection of Opto-electronic Devices
07919	Reflex Opto-electronic Switching Matrix
07936	Multi-Bit Error Correction of Digital Data
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07996	Compact Antenna Array for Interference Cancellation
08184	4800 bps Multi-Pulse Excited Linear Predictive Vocoder
08416	Data Encryption Over X.25 Packet Switching Networks
08457	Dual Polarization Electromagnetic Power Reception and Conversion
08487	CAPSSB MODEM Technology
08561	Microwave Powered Aircraft
08982	Fabrication Technique for Fused Taper Directional Couplers
09005	Convolution Codec Software Package
09006	Aviation BPSK Modem Software
09200	Digital Transmultiplexer with Automatic Threshold Controller
09228	8000 bps Codebook Excited Linear Prediction Vocoder
09269	Dual Polarization Microstrip Array Antenna
09321	SYSPARC - System Management Data Base for Antenna Farm
09472	EPIRB (Emergency Position Indicating Radio Beacon) Measurement Software
09507	CHAT (Conversational Hypertext Access Technology)
09531	Low Noise Dual Polarization Electromagnetic Power Reception & Conversion System
09536	Aeronautical Mobile Satellite Protocol Software
09570	Dual Polarization Dipole Array Antenna
10000	Pattern Recognition Algorithm Technology
10001	TCMP Modem

LIST OF TECHNOLOGIES CONT...

CASE NO.	TITLE
10003	Integrated Remote Monitoring Apparatus (IRMA)
10005	Method of Creating an Index Grating in an Optical Fiber and a Mode Converter using the Index Grating
10011	Spectrum Management Technology
10012	Microwave Polarizing Lens Structure
10019	A Dual Polarization Spatial Filter
10022	Discrete Electronic Mail System (DiSKeM)
10027	RF Synthesizer
10028	Active Integrated Microstrip Antenna
10029	Self Calibrating Electronic Compass
10032	Shortened Conical Heli-Array
10033	GaAs Wafer Mapping and Analysis Software
10035	Authorizing Guide & Associated Software for CHAT (see 09507)
10037	A Narrowband Communications System for Mobile Radio Bands
10038	An Aviation L-Band Satcomm Antenna
10039	A Low Cost Mechanically Steered L-Band Antenna
10040	Aperture Coupled Microstrip Magic-T
10041	Multi-Media Script Language (MMSL) and MMS-d Interpreter
10042	High Performance Narrowband Vocoder
10044	DCT Video Compression Algorithm
10045	Bit Rate Control for Video CODEC
10046	Self-Steering Aeronautical L-Band Antenna
10047	Network Controller for FDMA Satellite Systems
10048	Communications Link Simulator - CRC Linksim
10049	Satellite Orbit Analysis Program
10050	CRCDAB - Coverage Simulation Software for COFDM Digital Audio Broadcasting (DAB)
10051	
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10053	Pre-compensated Frequency Modulation (PMF)
10054	Digital Broadcast Prediction program
10055	3-D Ray Tracing for Propagation Measurements
10057	SEMECS Antenna Technology
10058	MSAT DQPSK Modem

LIST OF TECHNOLOGIES CONT...

CASE NO.	TITLE
10059	Wide Band Channel Measurement System
10060	MSL and DVI Shell
10061	The Dependance of Indoor Radio Channel Multipath Characteristics on Transmit-Receive Range
10062	19.5 GHz Peltier cooled LNA
10063	Ka Band Power Amplifier
10064	Method for Imprinting Index Grating in Core of Optical Fibers and Optical Waveguides
10065	The Prevention of Forgeries in Personal ID's with Photos
10066	
10067	Relational Grocery Product Reader
10068	
10069	
10070	
10071	Photosensitization of Optical Fiber and Silicon-on-silicon Waveguides

TITLE: **Dual Slope Radiometer**

CASE No 7102

TECHNICAL ABSTRACT

A compact, rugged and low cost radiometer designed to measure the attenuation of radio signals by rain or cloud vapour. It may also be used to determine the integrated water vapour content along a path through the atmosphere. Its principle of operation can be easily extended from the microwave region into the infra-red and optical regions.

POTENTIAL APPLICATIONS

This technology is used to investigate precipitation attenuation along satellite paths. It may also be used for control of uplink power (i.e. it boosts uplink power in proportion to measured attenuation by the rain). Diversitel Communications Inc. of Ottawa, Ont., has developed the technology into commercial products that address these applications.

INVENTOR(s): J.I. Strickland

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
patent	USA	4,527,162	07/02/85
patent	Canada	1,187,941	05/28/85

TITLE: **Spectrum Shaping Microwave Digital Modulator**

CASE # 7145

TECHNICAL ABSTRACT

By pre-conditioning a baseband signal to compensate for nonlinearity in a high power PIN diode phase modulator, it is possible to place the modulators after the TWT amplifier driven to saturation by an unmodulated CW signal. A shaped spectrum at baseband will be translated to the RF carrier without spectrum spreading. This technique is applicable in low-cost, low data rate earth terminals and has the advantages of 1) significantly saving RF power, 2) avoiding high power amplifier nonlinearities, and 3) lowering the microwave equipment cost by eliminating up conversion equipment.

POTENTIAL APPLICATIONS

Any phase (BPSK or QPSK) modulation application that requires low data rates (kbps to low mbps range) and filtering (spectrum shaping).

INVENTOR(s): M. Cuhaci N.S. Hitchcock
GJP Lo

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
patent	USA	4,453,257	06/05/84
patent	Canada	1,182,875	02/19/85

TITLE: **Analog Voice Privacy Device**

CASE No 7316

TECHNICAL ABSTRACT

This analog voice privacy device provides two-way voice communication that is highly resistant to unauthorized reception. Its features include low cost subminiature implementation, no bandwidth expansion and high degree of robustness to poor communications conditions.

The device relies on digital techniques to scramble voice signals. The voice to be transmitted is converted to digital form at 8,000 samples per second and the samples are stored in blocks of 30 milliseconds, each containing 240 samples. Scrambling consists of delaying each block of 30 milliseconds by a random integer up to 16. A control link operating at 100 bits/second descrambles the information at the receiver. An exploiter of this technology requires knowledge in basic encryption techniques and the communications systems (i.e. wire, HF) that will incorporate it.

POTENTIAL APPLICATIONS

This technology is applicable to any voice communications requiring privacy. The most likely product from development of this technology would be an add-on device for radio and telephone systems. The radio version would likely be designed as a plug-in unit powered by the transceiver. The telephone version would be stand-alone and self-powered. Applications include VHF/UHF radio operating in the FM mode, HF radios operating in SSB mode and some satellite systems. It can also be used over the public switched telephone and cellular telephone networks. . It does not provide cryptographic security.

INVENTOR(s): K.R. Bryden J. Parent

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
pat. pend.	USA	App. 350,744	02/22/82
patent	Canada	1,188,739	06/11/85

TITLE: **Optoelectronic Compound Switching Matrix**

CASE No 7680

TECHNICAL ABSTRACT

This is an optoelectronic switching matrix apparatus. It allows the switching of multiplexed input signals and the transmission of selected signals by means of conventional heterodyning - filtering techniques. The desired outputs can thus be obtained from multiplexed input signals without the added complexity and cost of demultiplexers.

POTENTIAL APPLICATIONS

INVENTOR(s): K.O. Hill R.I. MacDonald

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
patent	USA	4,783,850	11/08/88
patent	Canada	1,256,605	06/27/89

TITLE: **VHF/UHF Computer Prediction Program & Terrain Data Base (Version 2.0)**

CASE No 7704

TECHNICAL ABSTRACT

Case Nos. 7704 and 7705 consist of a computer prediction program and a terrain database. The program predicts radio signal strengths on terrestrial paths at VHF and UHF, given a transmitter location and power, and given a receiver location or receiver locations. The transmission paths are in general obstructed by the terrain. Such predictions require a knowledge of the terrain along the transmission path. The Department of Communications (DOC) has developed a topographic data base that now covers the more populated areas of Canada. It consists of elevation and surface codes recorded at 500 metre intervals on a square array.

POTENTIAL APPLICATIONS

The most frequent application of this technology is land mobile planning (i.e. radio system design). It may also be used for broadcasting and point-to-point relays. DOC uses the technology for interference studies.

INVENTOR(s): J. Whitteker F.H. Palmer

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
copyright			

TITLE: **500 Metre Digital Terrain Data Base**

CASE No 7705

TECHNICAL ABSTRACT

This topographic database covers the more populated areas of Canada, and is often used in conjunction with technology described under Case No. 7704 ("VHF/UHF Computer Prediction Program"). It consists of elevation and surface codes recorded at 500 metre intervals on a square array. It is not an essential requirement for 7704, however, it greatly facilitates the use of the prediction program. This database may also be used independently of 7704.

POTENTIAL APPLICATIONS

See Case No. 7704 ("VHF/UHF Computer Prediction Program").

INVENTOR(s): J. Whitteker

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TITLE: **Optical Mixing/Demixing Device**

CASE No 7797

TECHNICAL ABSTRACT

The overall performance of this optical multiplexer is superior to other devices designed for fibre optic communication. Wavelength division multiplexing (WDM) offers better wavelength selectivity, low insertion losses and a controllable signal-to-noise ratio. Its modular structure provides a wide range of multiplexing/de-multiplexing capability.

POTENTIAL APPLICATIONS

The technology's primary application is 'fibre to the home' (subscriber loop).

INVENTOR(s): J.A. Dobrowolski E.H. Hara

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
patent	USA	4,707,064	11/17/87
patent	Canada	1,250,170	02/21/89
pat. pend.	Britain	App. 86305396.3	07/14/86
pat. pend.	France	App. 86305396.3	07/14/86
pat. pend.	Germany	App. 86305396.3	07/14/86
pat. pend.	Italy	App. 86305396.3	07/14/86
pat. pend.	EEC	App. 86305396.3	07/14/86
pat. pend.	Japan	App. 166,555/86	07/15/86

TITLE: **Hybrid Monolithic Interconnection of Opto-electronic Devices**

CASE No 7849

TECHNICAL ABSTRACT

A hybrid dielectric-semiconductor structure designed for large scale integrated (LSI) opto-electronic circuits to convert optical to electrical signals and vice versa. Aside from being reversible, the structure provides many additional advantages over the prior art in terms of fabrication techniques, operationand signal processing. Also see Case No. 7919 ("Reflex Opto-electronic Switching Matrix").

POTENTIAL APPLICATIONS

This technology has broad application to any communication system that involves interfacing fibre optics to electronic equipment. Thus, for example, potential applications include broadband switching and interconnection of computers.

INVENTOR(s): DKW Lam R.I. MacDonald

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
patent	USA	4,699,449	10/13/87
patent	Canada	1,253,949	05/09/89

TITLE: **Reflex Opto-electronic Switching Matrix**

CASE No 7919

TECHNICAL ABSTRACT

An opto-electronic switching matrix is combined with simple optical or electronic delay apparatus for broadband signal processing at frequencies higher than 100 MHz. Also see Case No. 7849 ("Hybrid Monolithic Interconnection of Opto-electronic Devices").

POTENTIAL APPLICATIONS

Applications for the device include digital switched filters, digital word generators, programmable bandpass filters and programmable delays.

INVENTOR(s): R.W. Jenkins DKW Lam
R.I. MacDonald

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
patent	USA	4,696,059	09/22/87
patent	Canada	1,245,303	11/22/88

TITLE: **Multi-Bit Error Correction of Digital Data**

CASE No 7936

TECHNICAL ABSTRACT

An error correction scheme which may be used in any digital communication system. It will automatically identify and correct any number of incorrect data bits in one received data packet. Under certain circumstances identification and correction of any number of errors in two data packets is also possible.

POTENTIAL APPLICATIONS

This error correction scheme can be applied to any digital data communication system. It was designed initially for broadcast teletext applications.

INVENTOR(s): B.C. Mortimer

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
patent	USA	4,769,818	09/06/88
patent	Canada	1,228,166	10/13/87
pat. pend.	Britain	App. 85105328.9	05/23/85
pat. pend.	France	App. 85105328.9	05/23/85
pat. pend.	EEC	App. 85105328.9	05/23/85

TITLE: **Small Adaptive Array Antenna**

CASE No 7946

TECHNICAL ABSTRACT

This antenna is designed for satellite to mobile earth terminal communications systems. It has an efficient medium gain, linearly polarized directional antenna which can handle high RF power and provides improved multipath signal discrimination. It is compact, has a low profile and is relatively inexpensive to manufacture.

POTENTIAL APPLICATIONS

This antenna can be incorporated into various mobile satellite communication systems, such as MSAT (Canada), AMSC (USA), INMARSAT (international) and AUSSAT (Austalia). It can be used in terrestrial, marine or aeronautical applications.

INVENTOR(s): R. Milne

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
patent	USA	4,700,197	10/13/87
patent	Canada	1,239,223	07/12/88
pat. pend.	Britain	App. 85304551.6	06/26/85
pat. pend.	France	App. 85304551.6	06/26/85
pat. pend.	Germany	App. 85304551.6	06/26/85
pat. pend.	Italy	App. 85304551.6	06/26/85
pat. pend.	Sweden	App. 85304551.6	06/26/85
pat. pend.	Japan	App. 144417.85	07/01/85

TITLE: **Compact Antenna Array for Interference Cancellation**

CASE No 7996

TECHNICAL ABSTRACT

A compact HF array for use in adaptive antenna systems. Directional properties of elements are enhanced by the use of grounded screens between elements.

POTENTIAL APPLICATIONS

This technology can be applied to fixed and mobile HF communications systems where interference (other users, jamming, etc) is a problem and space is at a premium.

INVENTOR(s): R.W. Jenkins

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
trade secret			

TITLE: **A 4800 bps Multi-Pulse Excited Linear Predictive Vocoder**

CASE No 8184

TECHNICAL ABSTRACT

A hybrid pitch-excited multipulse 4800 bps vocoder designed to provide secure medium bandwidth communications. It offers good voice quality at reasonable cost. The algorithm resides on two chips while the entire device uses just nine chips. This technology is not applicable to HF.

POTENTIAL APPLICATIONS

The technology is usually applied to local area networks (LAN) requiring reasonable speaker recognition.

INVENTOR(s): K.R. Bryden H.R. Hassanein

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
trade secret			

TITLE: **Data Encryption Over X.25 Packet Switching Networks**

CASE No 8416

TECHNICAL ABSTRACT

This is a technology to provide confidentiality of user data passed over X.25 networks. It can detect any modification or attempts to modify the user data stream. It accomplishes this by using security protocols and using a DES commercial crypto and /or a military grade crypto. User information is protected from source to destination.

POTENTIAL APPLICATIONS

This technology is applicable to any data communication system employing X.25 protocols, whether it be landline-based or satellite-based.

INVENTOR(s): G.R. Nourry W.T. Brown
W.A. Sullivan

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
trade secret			

TITLE: **Dual Polarization Electromagnetic Power Reception and Conversion**

CASE No 8457

TECHNICAL ABSTRACT

A device for the reception of microwave power and its conversion to useable direct current energy. This is essential for wireless transmission of electrical energy. The technology consists of a double layer rectenna that operates without the need for polarization tracking. The rectenna can be designed for any specified beam incidence angle. It also exhibits limited variations in reception efficiency in applications where the range of beam incidence cannot be carefully controlled, such as in the banking of an aircraft or the movement of the reception system over long distances. The rectenna power handling can be twice that of single linear rectenna arrays. (also see Case No. 9269). Related to SHARP (Stationary High Altitude Relay Platform) technology, which also includes Case Nos. 8561, 9269, 9531 and 9570.

POTENTIAL APPLICATIONS

The technology is applicable to any requirement for free space transmission of electrical power (i.e. powering of remote devices). In addition to the radio spectrum range indicated herein, it may also be used at frequencies in the optical range.

INVENTOR(s): A.W. Alden G.J. Jull T.T. Ohno

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
pat. pend.	USA	App. 124,159	11/23/87
pat. pend.	Canada	App. 577,680	09/16/88
pat. pend.	Japan	App. 295887/88	11/22/88
pat. pend.	Britain	App. 88311092.6	11/23/88
pat. pend.	France	App. 88311092.6	11/23/88
pat. pend.	Germany	App. 88311092.6	11/23/88
pat. pend.	Italy	App. 88311092.6	11/23/88
pat. pend.	Holland	App. 88311092.6	11/23/88

TITLE: **CAPSSB MODEM Technology**

CASE No 8487

TECHNICAL ABSTRACT

In mobile and mobile satellite environments, amplitude companded single sideband (ACSSB) schemes for speech transmission can offer a degree of robustness to fading and shadowing that is difficult for alternate approaches to match. One drawback of ACSSB signals is that neither their average nor instantaneous powers are constant. Constant average power single sideband (CAPSSB) is a new single sideband scheme that exhibits a nearly constant average transmit power and limits the peak instantaneous transmit power to only a few decibels above the average level. CAPSSB can provide full duplex voice communications in a 5 kHz wide radio channel.

POTENTIAL APPLICATIONS

This technology is applicable to mobile communications systems requiring robust analog transmission of voice in a full duplex mode. It is applicable to both terrestrial and satellite based systems, although it is unlikely that this technology would be applied to terrestrial cellular radio systems. CAPSSB offers commercial advantages over conventional FM techniques as performance and cost efficiencies would be realized whenever bandwidth efficiency is important and whenever low S/N ratio or severe fading is a problem (situations in which both FM and digital would be unintelligible).

INVENTOR(s): J. Lodge E. Matt

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
trade secret			

TITLE: **Microwave Powered Aircraft**

CASE No 8561

TECHNICAL ABSTRACT

This is a light weight, unmanned, electric-powered aircraft capable of sustained flight for periods up to 6 months. The aircraft features a nonlifting flat disc that provides a large surface for microwave energy receptors (rectennas). Microwave energy is transmitted from the ground to the rectennas, which subsequently convert the energy to direct current. The direct current is used to power the aircraft's electric motor and payload. This aircraft has excellent aerodynamic characteristics that ensure maximum utilization of microwave beam power. Related to SHARP (Stationary High Altitude Relay Platform) technology, which also includes Case Nos. 8457, 9269, 9531 and 9570.

POTENTIAL APPLICATIONS This technology can be used in any application requiring a high altitude radio relay platform. From its cruising altitude of 21 km the aircraft provides a ground coverage radius of 500 km. Specific applications include, but are not limited to, TV and sound broadcasting, mobile radio, wide-area cellular, wide-area paging, fixed and mobile telecom for video and data, atmospheric and terrestrial environmental monitoring, land and sea surveillance (illegal activities, forest fires, ice monitoring, etc) and vessel traffic.

INVENTOR(s): J.F. Martin, J.D. DeLaurier, G.W. Jull, A. Lillemark

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
pat. pend.	USA	App. 272,015	11/16/88
pat. pend.	Canada	App. 552,664	11/24/87
pat. pend.	Britain	App. 8827279.4	11/22/88
pat. pend.	Germany	App. p38397250	11/24/88
pat. pend.	France	App. 8,815,257	11/23/88
pat. pend.	Italy	App. 22707A/88	11/23/88
pat. pend.	Holland	App. 8802895	11/24/88
pat. pend.	Japan	App. 295917/88	11/22/88
pat. pend.	Israel	App. 88448	11/22/88

TITLE: **Fabrication Technique for Fused Taper Directional Couplers**

CASE No 8982

TECHNICAL ABSTRACT

This invention describes couplers exhibiting a large number of power transfer cycles and a coupling ratio which is very sensitive to wavelength, pressure or temperature. Such overcoupled couplers could be made into narrow band filters and pressure or temperature tunable couplers. Also described is a computerized system for making highly overcoupled couplers which are normally very difficult to make.

POTENTIAL APPLICATIONS

INVENTOR(s): K.O. Hill, S. Faucher, D.C. Johnson, F. Bilodeau

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
patent	USA	4,895,423	01/23/90
pat. pend.	Canada	APP. 556,261	01/11/88

TITLE: **Convolution Codec Software Package**

CASE # 9005

TECHNICAL ABSTRACT

The Convolution Codec Software Package consists a new digital signal processing (DSP) software which provides high performance and flexibility for data rates up to 4.8 kbps. It can be applied to satellite, terrestial radio or telephony communications systems. The software has been written with the TMS32020 assembler which is fully compatitble with the new CMOS double speed TMS320C25 version. This new software package, which includes scrambling and descrambling, convolutional encoding and Verbeti decoding, interleaving and de-interleaving and other such enhancements. Because the entire package is contained on a single DSP chip, this will reduce the size and cost of communications transmitters and receivers.

POTENTIAL APPLICATIONS

This technology can be applied to any data communications system, whether it be satellite, terrestial radio or telephony, where bit error correction, power spreading and fading countermeasures are required. The technology is packaged in a modular format such that any or all of these three (3) features may be used in a given application.

INVENTOR(s): P. Tardif

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
Copyright			

TITLE: **Aviation BPSK Modem Software**

CASE # 9006

TECHNICAL ABSTRACT

This modem software is TMS320 based. It implements the 600 and 1200 bps portion of the international Aeronautical Mobile Satellite Service (AMSS) standard, which is set by ICAO. This includes the continuously transmitted froward link P-channel as well as the burst mode return link R-channel and T-channel.

POTENTIAL APPLICATIONS

This technology can be applied to any aeronautical satellite based data communications system. Presently, it is being applied to Inmarsat systems. It could be used in other mobile satellite based systems, such as MSAT, AMSC and AUSSAT. Although the technology was developed for satellite systems, it could be extended to any application requiring a high performance, low data rate (1200 bps or less) modem.

INVENTOR(s): M. Moher F. Patenaude

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
Copyright			

TITLE: **Digital Transmultiplexer with Automatic Threshold Controller**

CASE # 9200

TECHNICAL ABSTRACT

An analog-to-digital (A/D) converter with enhanced capacity. It converts signals into a number of channels of PSK modulated data. The output of each A/D converter is applied to an automatic threshold controller whose output provides an analog reference signal. This reference signal is applied to a reference input of the associated A/D converter. The reference signal corrects any DC offset error for the A/D converter and prevents degradation in energy per bit-to-noise density ratio.

POTENTIAL APPLICATIONS

This technology was designed for on-board processing on communications satellites. However, it can be applied to any system requiring A/D conversion.

INVENTOR(s): C. Loo M. Umehira

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
pat. pend.	Canada	App. 604,115	06/27/89
pat. pend.	USA	App. 540,771	06/20/90

TITLE: **8000 bps Codebook Excited Linear Prediction Vocoder**

CASE # 9228

TECHNICAL ABSTRACT

An algorithm implemented on a single microprocessor (TMS-320 C25) which enables the compression, storage and transmission of speech. A 4800 bps version is also available. Speech quality is excellent over a wide range of speaker and background noise condition. Potential applications include digital mobile radio, voice mail and voice response systems. The technology is not applicable to HF. It is especially applicable to mobile communication systems requiring robustness to background noise, channel errors and speaker agitation (shouting).

POTENTIAL APPLICATIONS

The technology is applicable to mobile radio and electronic voice mail, especially applications requiring good voice quality and speaker recognition.

INVENTOR(s): K.R. Bryden A. Brind'Amour
H.R. Hassanein

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
trade secret			

TITLE: **Dual Polarization Microstrip Array Antenna**

CASE # 9269

TECHNICAL ABSTRACT

This antenna array is designed for efficient reception or transmission of electromagnetic waves over a wide range of frequencies and angles of incidence. Its microstrip and conformal nature is particularly suitable for high frequency operation for which other antennas and associated circuitry would be difficult and more expensive to make. In addition, its relatively high power handling capacity makes it suitable for use as a rectenna for power reception. In this application, this rectenna operates without the need for polarization tracking. The rectenna power handling can be twice that of dual polarization arrays, such as the one described under Case No. 8457. Related to SHARP (Stationary High Altitude Relay Platform) technology, which also includes Case Nos. 8457, 8561, 9531 and 9570.

POTENTIAL APPLICATIONS

Any application requiring free space transmission of electrical power (i.e. powering of remote devices). In addition to the radio spectrum range indicated herein, the technology can be applied to frequencies in the optical range.

INVENTOR(s): A.W. Alden T.T. Ohno

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
pat. pend.	USA	APP. 447,401	12/07/89
pat. pend.	Canada	APP. 587,182	12/28/88
pat. pend.	EEC	APP. 89123134.2	12/14/89
pat. pend.	France	APP. 89123134.2	12/14/89
pat. pend.	Britain	APP. 89123134.2	12/14/89
pat. pend.	France	APP. 89123134.2	12/14/89
pat. pend.	Germany	APP. 89123134.2	12/14/89
pat. pend.	Italy	APP. 89123134.2	12/14/89
pat. pend.	Holland	APP. 89123134.2	12/14/89
pat. pend.	Japan	APP. 338054/89	12/26/89

TITLE: **SYSPARC-System Management Data Base for Antenna Farm**

CASE # 9321

TECHNICAL ABSTRACT

The system management database software for antenna farms was developed to eliminate the manual maintenance of information associated with antenna farms and also to perform the necessary calculations related to elctromagnetic compatibility studies. The software will allow radio communication companies to make those studies using departmental standards and therefore speed up licensing procedures. Though SYSPARC was designed to meet Canadian standards, it could be used for electromagnetic compatibility studies anywhere.

POTENTIAL APPLICATIONS

The primary applications of this technology are (i) establishing and maintaining antenna installations and (ii) conducting studies in electromagnetic compatibility.

INVENTOR(s): J. Pinard

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
copyright			

TITLE: **EPIRB (Emergency Position Indicating Radio Beacon)**

CASE No 9472

TECHNICAL ABSTRACT

This software is designed to measure the parameters of various radio beacons (EPIRB, PLB, ELT) under certain environmental conditions. It measures all parameters required by the COSPAS-SARSAT specifications, as well as those specified by TP4522 (an MOT standard) and RSS187 (a DOC specification). It can also be adapted to requirements of other countries. The measurement system uses off-the-shelf instruments. The method used to measure the phase deviation is unique and provides a wider bandwidth, and hence better accuracy than the method presently available.

POTENTIAL APPLICATIONS

The software can be used to test the performance of various types of EPIRBS (406 MHz & 121.5 MHz), including PLBs and ELTs.

INVENTOR(s): S.L. Bouchard LMJ Desjardins
L.R. Dick

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
copyright			

TITLE: **CHAT (Conversational Hypertext Access Technology)**

CASE # 9507

TECHNICAL ABSTRACT

CHAT is a computer program that allows people to obtain answers from a computer simply by asking questions in your own words. It is presently available in English but can be adapted to other languages. Thus CHAT provides a natural language interface that allows people to obtain information quickly, without the need to learn complex computer querry commands. The system can incorporate graphics and sounds, thereby providing the user with diagrams, videos and other information that can make the answer more informative and entertaining. Presently CHAT runs on UNIX and IBM-compatible operating systems.

POTENTIAL APPLICATIONS

CHAT is applicable to any environment in which a person requires answers to specific questions he or she may have, whether they be of a technical nature or entirely for entertainment purposes. Thus, for example, Rockwood Informatics of Fredericton, NB, has developed a CHAT system to provide people with a confidential means to obtain up-to-date information on AIDS. It provides straight answers to sensitive questions. Rockwood is also developing a CHAT system for counsellors requiring information on a variety of counselling skills and techniques. CHAT has application in the entertainment field, such as providing cable viewers with a real-time communication interface to the broadcaster ('viewers choice'), or providing viewers with the rules and terms of the game of baseball. CHAT itself is not an Expert System, but it could be used as an interface between the user and an Expert System.

INVENTOR(s): T. Whalen A. Patrick

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
copyright			

TITLE: **Low Noise Dual Polarization Electromagnetic Power Reception & Conversion**

CASE # 9531

TECHNICAL ABSTRACT

Low Noise Dual Polarization Electromagnetic Power Reception and Conversion System: Due to the high power levels used in EM power transmission, EM radiation is generated by the power reception and conversion system also known as a rectenna, which could deteriorate the performance of other electronic systems due to EM interference. This invention overcomes this deficiency by providing frequency bandpass and bandstop elements in front and behind the rectenna elements respectively to reduce the level of rectenna radiation.

Related to the SHARP (Stationary High Altitude Relay Platform) technology, which also includes Case Nos. 8457, 8561, 9269 and 9570.

POTENTIAL APPLICATIONS

Any application requiring free space transmission of electrical power (i.e. powering of remote devices). In addition to the radio spectrum range indicated herein, the technology can be applied to frequencies in the optical range.

INVENTOR(s): A.W. Alden G.W. Jull
T.T. Ohno

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
pat. pend.	Canada	App. 2,006,481	12/19/89

TITLE: **Aeronautical Mobile Satellite Protocol Software**

CASE # 9536

TECHNICAL ABSTRACT

This software implements specific protocols of the international Aeronautical Mobile Satellite Service (AMSS) standard, which is set by ICAO. Specifically, it is a PC-based implementation of the link layer P, R and T channel protocols. The software can be used to simulate and validate these protocols and can be integrated into a communications terminal.

POTENTIAL APPLICATIONS

This technology is restricted to apllications involving aeronautical mobile satellite systems that conform to ICAO standards. Thus, it is applicable to MSAT, AMSC, Inmarsat and AUSSAT. It could also be used in simulation of such systems.

INVENTOR(s): M. Moher

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
copyright			

TITLE: **Dual Polarization Dipole Array Antenna**

CASE # 9570

TECHNICAL ABSTRACT

A single layer, easily manufactured array has been designed for the high efficiency power reception or transmission of electromagnetic waves. It is applicable over a wide range of frequencies and angles of incidence. The design permits high power handling for applications such as the remote powering of airborne platforms.

Related to SHARP (Stationary High Altitude Relay Platform) technology, which also includes Case Nos. 8457, 8561,9269 and 9531.

POTENTIAL APPLICATIONS

Any application requiring free space transmission of electrical power (i.e. powering of remote devices). In addition to the radio spectrum range indicated herein, the technology can be applied to frequencies in the optical range.

INVENTOR(s): A.W. Alden T.T. Ohno

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
pat. pend.	Canada	App. 2,011,298	03/01/90

TITLE: **Pattern Recognition Algorithm Technology**

CASE # 10000

TECHNICAL ABSTRACT

Special purpose pattern recognition algorithms using multiple binary decision tree classifiers have been developed at CRC. The advantages of the algorithms are their speed and robustness. An example of their application was the development of a passport reader. The technical 'know how' may consist of customized demonstration software, the decision tree table, and customized algorithms including performance analysis.

POTENTIAL APPLICATIONS

Applications of this technology include optical character recognition, processing of remotely sensed data, mass spectra analysis and many areas of the medical field (eg. white blood cell recognition etc.)

INVENTOR(s): S. Shlien

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
Copyright			

TITLE: **TCMP Modem**

CASE # 10001

TECHNICAL ABSTRACT

This modem provides robust transmission of data or digitized voice at low rates (4.8 kbps in 5 KHz channels) in the presence of moderate to severe multipath fading, which is typical of mobile radio channels. Such fading can be caused by signal reflections from objects in the proximity of the radio receiver. Conventional modulation techniques provide poor bit error rates under fast fading conditions. The Trellis Coded Modulation with Pilot (TCMP) technique overcomes this deficiency with powerful error correction coding and the use of reference symbols. The modem, which requires a linear amplifier, is capable of operating in a burst mode, thereby saving satellite power and allowing voice activated operation.

POTENTIAL APPLICATIONS

The primary applications for this modem are for both the transmission of digital voice and data. Thus, for example, it can be incorporated into any satellite system involving digital voice communications (eg. MSAT, AUSSAT, INMARSAT-M, AMSC).

INVENTOR(s): R.J. Young J. Lodge

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
trade secret			

TITLE: **Integrated Remote Monitoring Apparatus (IRMA)**

CASE # **10003**

TECHNICAL ABSTRACT

IRMA is a transportable, automated monitoring system capable of collecting radio frequency occupancy data (ie. airtime usage) and performing off-air technical measurements, all from a remote location.

The total concept is unique in that: 1) It uses a multi-tasking control environment for maximum user advantage. 2) Two methods of access and control are provided in the form of standard telephone DTMF and a PC compatible terminal mode. 3) The collected occupancy data is sorted and stored in a database suitable for evaluation and display on a personal computer or printout.

POTENTIAL APPLICATIONS

An opportunity exists for spectrum management service providers to government and other large organizations or businesses where types and level of radio traffic can be important to operations (eg. law and drug enforcement, forest fire watch, illegal hunting and fishing, border crossing, etc.)

The system can also be used to act as a controller for other test and/or measurement devices.

INVENTOR(s): E. McLaughlin, A. Solomon, Brent Seles, D. Slingerland, K. Myles, Glen Ritchie

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
Copyright			

TITLE: **Method for creating an Index Grating in an Optical Fiber and a Mode Converter**

CASE # **10005**

TECHNICAL ABSTRACT

This is a point-by-point method for the writing of index gratings in optical fibers or optical waveguides from the side by using the photosensitivity of the fiber to ultraviolet light. This invention provides for a more flexible technique for writing gratings in fibers. A further purpose of this invention is to fabricate a mode-converter by writing gratings in a fiber. The function of a mode-converter is to convert light propagating in one mode of a waveguide to another mode of the waveguide. In addition, through a photo-induced birefringent effect, the fabrication of high performance rocking filters in a practical configuration is possible. The latter can be an important device for optical communications.

POTENTIAL APPLICATIONS

This invention has promising commercial applications. It can be used directly in the fabrication of certain WDM devices like reflection filters, including distributed-feedback mirrors on the ends of an optical fiber laser. This provides a practical means for making a tunable narrow frequency fiber laser. The invention also has application to the development of sensors to be contained in smart structures, eg, an embedded fiber-grating can provide a method for monitoring strain.

INVENTOR(s): K.O. Hill, B. Malo, F. Bilodeau, D.C. Johnson

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
Pat. pend.	U.S.	Appl #656,462	09/09/91

TITLE: **Spectrum management Technology**

CASE # 10011

TECHNICAL ABSTRACT

Spectrum Management Technology is a collection of computer software and related documentation, technical documentation, training material, reports, notes and other documentation and operational know-how relating to spectrum management. The latter includes spectrum engineering and planning, authorization, spectrum control and computer-aided spectrum management tools.

SMT was developed by the Spectrum Enginerring Programs office of DOC.

POTENTIAL APPLICATIONS

INVENTOR(s): contact is Claude Dosteler

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
Copyright			/ /

TITLE: **Microwave Polarizing Lens Structure**

CASE # 10012

TECHNICAL ABSTRACT

This technology is related to Case No. 7946 (Small Adaptive Array Antenna).

Also refer to CPDL case no. 8965.

POTENTIAL APPLICATIONS

Applications of this technology are similar to those described in Case No. 7946 ("Small Adaptive Array Antenna").

INVENTOR(s): R. Milne

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
Trade Secret			/ /

TECHNOLOGY TRANSFER OFFICE
(TEL. 613-991-3313)
(FAX 613-998-3185)

TITLE: **A Dual Polarization Spatial Filter**

CASE # **10019**

TECHNICAL ABSTRACT

The invention relates to the protection of antenna arrays from unwanted incoming signals and the prevention of radiated spurious signals from the array. This is a superior spatial filter system with characteristics such as to minimize the levels of spurious signals radiated by a rectenna array 1) at harmonics of the powering signal frequency and 2) as intermodulated signals resulting from the nonlinear mixing of the powering and communications signals incident on a rectenna. This filter is capable of operating efficiently on a wide range of angles as may be required to accommodate variations in angular orientation of a rectenna system relative to the direction of the incident electromagnetic powering signal wavefield.

POTENTIAL APPLICATIONS

Current applications relate to use on the Stationary High Altitude Relay Platform (SHARP) in conjunction with the microwave (5.8 GHz) power converting rectenna. (see Case No. 08561)

INVENTOR(s): A.W. Alden

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
Trade secret			

TITLE: **Discrete Electronic Mail System (DISKEM)**

CASE # **10022**

TECHNICAL ABSTRACT

DiSKeM is a software package that provides a means of very high secure communications between personal computers over public communications channels. Using a combination of public and private key encrytion and authentication techniques, DiSKeM is a no-hardware system designed to be a cost effective solution that is easy to install and easy to use. DiSKeM provides a simple interface to the communication system. It does not limit the number of users, nodes or networks or the size of message files to be transmitted.

System Requirements

- A fast PC - Intel 386 /486 at 25 or 33 Mhz.
- DOS 3.0 or later
- A Minimum of 512 KBytes of memory and 1 MByte of free file storage space.
- Floppy disk drive is optional to archive DiSKeM files and for users private key files for added security.

POTENTIAL APPLICATIONS

Any application requiring a digital signature for electronic documents (CAD, inventory control, order processing, e-mail, fax, etc.)

INVENTOR(s): N. Serinken

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
Copyright			/ /

TITLE: **RF Synthesizer**

CASE # 10027

TECHNICAL ABSTRACT

This is a complete self-contained RF synthesizer circuit including VCO, phase detector, loop filter and all supply decoupling. The centre frequency of the synthesizer is adjustable from 70 to 250 MHz. Tuning is achieved by changing the turns on an oscillator coil, while step size is adjustable by programming from an extenal micro-processor. The design is available as a printed circuit.

One version of this technology is currently marketed by GEMTRONIC Engineering Limited of Nepean, Ont. as a 1" x 2" self-contained "Hybrid Integrated Circuit" module intended for professional communications. It boasts a synthesizer range of 50 to 350 MHz, where different modules each cover a 40 MHz operating range.

FEATURES:

- 30 MHz to 6 GHz (product range)
- Fine frequency steps (As low as 1 Hz)
- Low spurious output (-60 dBc or better)
- Low phase noise (determined by reference input)
- No complex filters (uses cancellation method)
- Optional modulation capability
- Frequency hopping (as fast as 1 microsecond)

POTENTIAL APPLICATIONS

INVENTOR(s): R. Datta

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
Trade Secret			

TITLE: **Active Integrated Microstrip Antenna**

CASE # 10028

TECHNICAL ABSTRACT

An antenna element has been developed which is combines the advantages of a microstrip patch, travelling wave structure and Monolithic Microwave Integrated Circuit (MMIC). This provides for an antenna array which can be an efficient radiator, offers wide bandwidth, can be easily integrated with active devices and allows element reconfigurability.

The initial design is circular. However, other implementations include linear or elliptical arrangements. Novel smaller arrays are possible with these elements. Where antennas are to be integrated on a semiconductor wafer, where wafer area is at a premium, the approach offers significant potential savings. Single surface integration can also offer significant potential for lower fabrication cost.

POTENTIAL APPLICATIONS

This invention has great potential for future sophisticated arrays where high performance reconfigurability is desired. One application could be in large high performance military systems where extreme agility, reconfigurability and steerability are desired; eg. airborne radar and communications. Variations on the antenna approach could be realized to meet MSAT or other portable antenna demands. A future application may be in small integrated active EHF antennas for personal communications.

INVENTOR(s): A. Ittipiboon L. Shafai
D. J. Roscoe

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
Patent	U.S.	07/718450	06/20/92

TITLE: **Self Calibrating Electronic Compass**

CASE # 10029

TECHNICAL ABSTRACT

This is a self-calibrating electronic compass that can compensate for magnetic anomalies or perturbations in platforms on which it is mounted. The compensation algorithm is powerful enough to provide correct headings position after a minimum of 90 degree rotation. Close to optimal compensation can be obtained after a 180 degrees rotation of the platform. In addition, the compensation accuracy is totally independent of the speed of rotation or the path followed by the platform during the calibration. This makes it an ideal device when ease of installation and maintenance are of a prime concern. It can be used for supplying directional information for general purpose navigation and mobile satellite antenna control used on vehicles such as a car, boat or airplane. Its algorithm leads itself to be used in a 3D auto-calibrating compass.

FEATURES:

- Powerful calibration algorithm allowing complete platform compensation after a minimum of 180 degrees rotation independent of vehicle path and/or rotation speed.
- Calibration accuracy maintained in a 3 degree range using 8 bit sampler
- Algorithm can be extended for use in a 3D auto-compensating compass.
- Algorithm continually adapts to slow changes in the magnetic platform

POTENTIAL APPLICATIONS

Although originally designed for use with an adaptive array antenna, which is described in Case No. 7946 ("Small Adaptive Phased Array Antenna"), the compass can be applied to any mobile satellite communication system, whether it be designed for terrestrial, aeronautical or marine applications. Presently the technology is being applied to terrestrial mobile vehicle applications. Further development would be required for application to marine and aeronautical markets.

INVENTOR(s): M. Dufour

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
Pat. pend.	U.S.	App.07/862,024	04/02/92

TITLE: **Shortened Conical Helix Array**

CASE # 10032

TECHNICAL ABSTRACT

This is a high gain, low cost L-Band antenna designed specifically for fixed (i.e. non-mobile) satellite communications apllications. It can be used for data collection platforms, fixed L-Band satellite telephony, etc. The antenna allows G/T s of - 12 dbK to be achieved. It has a capability of being oriented in azimuth and elevation.

POTENTIAL APPLICATIONS

This antenna differs from those described in Case Nos. 10038 ("An Aviation L-Band Satcomm Antenna") and 10039 ("A Low Cost Mechanically Steered L-Band Antenna") in that it is designed for fixed service terrestrial applications, as opposed to mobile aviation (Case No. 10038) or mobile terrestrial (Case No. 10039) applications. Like Case Nos. 10038 and 10039, this technology can be applied to any satellite communications system, including MSAT, INMARSAT, AMSC and AUSSAT. Its small size and relatively high gain and low production costs gives it advantages over existing products.

INVENTOR(s): J. Sydor R. Yank

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
Trade Secret			

TITLE: **GaAs Wafer Mapping and Analysis Software**

CASE # 10033

TECHNICAL ABSTRACT

This is a Wafer Map and Yield Analysis software package which provides for the control of semiconductor wafer measurement equipment, collection of performance data and display and output of the data (e.g. graphical, wafer map etc.) in convenient forms (CRT, plotter, laser printer etc.) to allow the user to assess the characteristics of the measured components and determine their yield against a set of specifications. The package includes all necessary software modules, related files and the Wafer Map User Manual.

POTENTIAL APPLICATIONS

This software was designed for application to microwave integrated circuit analysis. The software can be tailored for use with any available automatic Network Analyser/ Wafer Prober combinations. Plans are in place for enhanced application software for DC wafer probing, mapping and characterization.

INVENTOR(s):

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
Copyright			

TITLE: **Authoring Guide & Associated Software for CHAT**
(see case 9507)

CASE # 10035

TECHNICAL ABSTRACT

This is a proprietary document entitled "A guide for Preparing CHAT Information Files" and three associated software programs named STATEMAKER, SCORETRN, and VIEWTRN. The document describes a process for developing databases to be used with the CHAT software. The associated programs are used in the process of creating a CHAT database.

CHAT (Conversational Hypertext Access Technology) provides easy access to electronic information. It is a natural language interface that allows the user, with little computer training, to ask questions in their own words and receive answers.
(See Case # 09507 for a more detailled description of CHAT).

POTENTIAL APPLICATIONS

INVENTOR(s): T. Whalen A. Patrick

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
Copyright			

TITLE: **A Narrowband Communications System for the Mobile Radio Bands**

CASE # 10037

TECHNICAL ABSTRACT

This technology is a voice compression technique developed for narrowband mobile radio communications systems. It was developed in response to a requirement for more efficient use of the radio spectrum. The technique involves linear modulation, speech bandwidth reduction and digital signal processing (DSP). It is developed in the form of Narrowband Speech Quadrature Amplitude Modulation (NSQAM), which significantly reduces the amount of spectrum required for voice communications. This technique keeps a little more than 1/3 of the original speech bandwidth, and is in a form that can be encrypted. Once linearly modulated, the occupied RF channel spacing is expected to have a 70 dB bandwidth of about 2.5 kHz. This represents a tenfold increase in the number of available channels, when compared with the actual 25 kHz mobile FM radios.

POTENTIAL APPLICATIONS

This technology is applicable to any land, aeronautical or marine mobile radio communication system using the VHF or UHF bands. For example, it could be used in systems employed by police, taxis, trucking firms, air traffic controllers, marine search and rescue agencies, etc. In addition, the technology could be further developed for application to satellite based communications systems, or to provide encryption on the public switched telephone network (PSTN).

INVENTOR(s): L. Boucher, J. Lodge, Y. Jolly, S. Dery

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
Trade Secret			

TITLE: **An Aviation L-Band Satcom Antenna**

CASE # 10038

TECHNICAL ABSTRACT

This is a mechanically steered antenna having radome dimensions of 6" X 12" X 24". The antenna is designed for use with small general purpose aircraft, and it meets most of INMARSAT's Aeronautical specifications. It can be steered under control of the aircraft's avionics, or independently using self-contained position and signal strength sensors.

POTENTIAL APPLICATIONS

Although this technology is designed for systems involving INMARSAT Aeronautical specifications, it can be applied to any L-Band mobile satellite communications system. Thus any aeronautical application involving MSAT, AMSC or AUSSAT could incorporate this technology. Developers interested in terrestrial mobile applications of this type of technology should see CASE No. 10039 (A Low Cost Mechanically Steered L-Band Antenna").

INVENTOR(s): J. Sydor

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
Trade secret			

TITLE: **A Low Cost Mechanically Steered L-Band Antenna**

CASE # 10039

TECHNICAL ABSTRACT

This is a mechanically steered antenna for L-Band satellite communication systems. It allows G/T s of - 12 dbK or better to be achieved over elevation angles of 40 degrees. The antenna has a proprietary low cost, brushless azimuthal motoring system. The antenna radome measures 10" in diameter and 6" in height.

POTENTIAL APPLICATIONS

This technology differs from CASE No 10038 ("An Aviation L-Band Satcomm Antenna") in that its primary application is terrestrial mobile satellite communications systems, as opposed to aeronautical systems. Like CASE No 10038, this antenna could be applied to any mobile satellite communications system, including INMARSAT, MSAT, AMSC and AUSSAT. It has advantages over existing L-Band antennas in that it is smaller, has higher gain and is generally of lower cost.

INVENTOR(s): J. Sydor

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
Trade secret			

TITLE: **Aperture Coupled Microstrip Magic-T**

CASE # 10040

TECHNICAL ABSTRACT

A trend of modern microwave circuit design is a move towards multilevel circuitry in response to advancements made in microwave printed circuit technology. One application of multilevel circuitry is in the area of planar phased array antennas. To overcome problems of power loss and excess component real estate in the coupling of the antenna, a unique printed "Magic-T" has been invented which can be readily integrated to a multilevel circuit. Bandwidths in excess of over 40% have been demonstrated with isolation in excess of 30 dB. A Feature of the Magic Tee is its use of an aperture coupled approach which permits isolation between separate circuit layers.

POTENTIAL APPLICATIONS

Potential uses include all planar microwave and millimeter wave antenna and RF subsystems. As radars and communication systems shrink in size, more and more planar structures are used in the RF components. This technology will permit the miniaturization of waveguide magic-T's in RF subsystems such as mixers, modulators and other multi-port devices.

INVENTOR(s): A. Ittipiboon, M. Cuhaci, W. Katsube, Y. Antar

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
pat. pend.	U.S.		/ /

TITLE: **Multi-media Script Language (MMSL) & MMS-d Interpreter**

CASE # 10041

TECHNICAL ABSTRACT

Multi-Media Script Language (MMSL) is a language used to control multimedia presentations. MMSL provides a level of control that provides maximum flexibility while still being easy to use. The language defines commands to display still and moving pictures, play audio files, and print text as well as do basic special effects such as fades, zooms, overlays, and chroma keying. In addition, the language supports basic flow control (e.g., "if" statements, loops, "goto", script chaining) and integer and string variables.

MMS-d is a computer program that implements the Multi-Media Script Language (MMSL) for Intel's DVI multimedia boards. MMS-d runs on IBM-PC compatible computers that are equipped with the ActionMedia display board. Using MMS-d, a person can build an application by assembling MMSL commands in a simple ASCII file. In addition, MMS-d can be used interactively so that the results of commands are seen immediately. This interactive capability makes authoring and debugging easier.

POTENTIAL APPLICATIONS

The MMS-d interpreter was designed such that it could be integrated with other applications. People who have the DVI C libraries are able to compile the MMS-d interpreter into their applications. This provides an easy route to giving applications a multimedia capability. For example, CRC has integrated MMS-d with its natural language information retrieval system such that answers to questions can include pictures, sounds, and moving images.

INVENTOR(s): T. Whalen A. Patrick

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
Copyright			/ /

TITLE: **High Performance Narrowband Vocoder**

CASE # 10042

TECHNICAL ABSTRACT

This is a vocoder which has performance properties similar to the 8000 bps vocoder described in Case # 09228 yet operates at only 2400 bps.
(This technology is under development and will not be available before March, 1993)

POTENTIAL APPLICATIONS

This invention should find application wherever very narrowband digital voice communication is desired.

INVENTOR(s): H.R. Hassanein A. Brind'Amour
K.R. Bryden

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
Trade Secret			/ /

TITLE: **DCT Video Compression Algorithm**

CASE # 10044

TECHNICAL ABSTRACT

A hybrid DPCM/DCT video compression algorithm combines Digital Pulse Code Modulation (DPCM) and Discrete Cosine Transform (DCT) coding to remove the two basic types of redundancy in natural video signals: temporal and spatial correlation. By performing temporal DPCM followed by DCT in the spatial domain a high compression ratio is achieved. This ratio can vary from application to application.

A hybrid DPCM/DCT video algorithm has been developed at CRC which contains a number of advanced compression techniques as well as a few novel techniques which successfully cope with major change in picture content due to fast motion, uncovered background or scene change. The input video signal codec can be either of composite NTSC or component RGB (CCIR 601) format. A pre-processor converts the input video signal into the YUV format with the color sampling ratio of 4:1:1. The output video format can be either composite NTSC or component RGB.

POTENTIAL APPLICATIONS

The hybrid video compression algorithm is applicable to any digital video storage and communications, such as video telephony and video conferencing, broadcasting of digitized TV signals, etc.

INVENTOR(s): Limin Wang A. Vincent

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
Trade Secret			

TITLE: **Bit Rate Control for Video CODEC**

CASE # 10045

TECHNICAL ABSTRACT

Hybrid DPCM/DCT coding with motion and compensation is the most commonly used techniques to achieve high data compression for digital video signals. However, it is quite often that the compressed bit stream, generated by the hybrid video codec at a variable rate, needs to be transmitted over a fixed rate channel. The Signal Processing Group at CRC recently invented a simple approach to regulating the output bit rate for the hybrid DPCM/DCT video codec. The experimental results demonstrated that the fluctuation of output bit rate is successfully controlled within a very small range without sacrificing the quality of the reconstructed images, which significantly alleviates the channel buffer requirement (or the size of buffer).

POTENTIAL APPLICATIONS

The bit rate control approach is applicable to any digital video codec which produces a variable output bit rate.

INVENTOR(s): Limin Wang A. Vincent

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
Trade Secret			

TITLE: **Self-Steering Aeronautical L-Band Antenna**

CASE # 10046

TECHNICAL ABSTRACT

This is a self-steering L-Band satellite communication antenna system for use on small general purpose aircraft. Overall dimensions of the antenna system are 35"(L) x 7"(H) x 12"(W). It meets most of INMARSAT's Aeronautical specifications. A 3-D version of the magnetic field compass (see Case # 10029) provides input to a proprietary low cost, brushless azimuthal motoring system to eliminate the need for interfacing to an aircraft's avionics. The system uses a version of the high gain shortened conical heli-array described in Case # 10032. The antenna allows G/T's of - 12 dBK to be achieved. (NOTE: This technology is currently under development and will not be available before September 1992)

POTENTIAL APPLICATIONS

Although this technology is designed for systems involving INMARSAT Aeronautical specifications, it can be applied to any L-Band mobile satellite communications system. Thus applications involving MSAT, AMSC or AUSSAT could incorporate this technology.

INVENTOR(s): J. Sydor

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
Trade Secret			

TITLE: **Mobile Satellite Channel Monitoring & Control System for FDMA Satellite Systems**

CASE # 10047

TECHNICAL ABSTRACT

This is a set of specialized software and hardware designed to control the downlink power and frequency of multi-carrier satellite signals originating at a Central Earth Station. The system has been approved by Inmarsat to control a 3 channel, 21 dBW EIRP subsystem containing a mix of analog and digital narrowband voice communication carriers originating from up to 20 mobile earth terminals. The channels are 5 KHz wide having no guard band. This system has undergone extensive testing and is being continuously used for day to day operations.

Up to 32 downlink satellite signals can be controlled to within 0.25 dB in power. Smooth, uninterrupted power control is exercised eliminating any break in the continuity of the transmitted signal, which can be deleterious to digital modulation. Both constant envelop and dynamically varying power signals can be controlled. Power levels are compared to either satellite originated reference signals or on-site references provided by the user. Monitored channels need not be contiguous. The frequency of the downlink channels is monitored and signals that are out of range are identified to operators for corrective action. AFC is possible with this system but is provided as a separate, custom feature.

The CRC package includes software, documentation, and proprietary GPIB attenuator hardware. The system is flexible and can be configured to work simultaneously (using multitasking software) with thin route demand assignment multiple access protocol control and billing subsystems resident on the same computer. The software is user friendly and is well documented. All parameters related to channel or signal monitoring are easily changed. The user needs to supply a GPIB interfaceable RF spectrum analyzer and a IBM compatible 386 computer with DOS 3.3 or higher.

INVENTOR(s): J. Sydor M. Dufour

PROTECTION	TYPE	COUNTRY	NUMBER	ISSUE DATE
	Trade Secret			

TITLE: **Communications Link Simulator - CRC Linksim**

CASE # 10048

TECHNICAL ABSTRACT

CRC Linksim is a software simulation package used for performance analysis of communications systems. It uses digital signal processing techniques to implement a model of a complete communication link. Random data is transmitted through the simulated link and errors are counted. The program offers the user a wide range of modulation types, error correction codes, and receiver structures as well as the ability to enter user designed transmit and receive filters. Available channel requirements include AWGN, flat multipath fading, adjacent channel interference and fixed frequency offsets.

The program is written in ANSII C and is currently run on IBM and compatible PCs. Both the source and PC executable files can be provided. Straight forward user documentation is also provided.

POTENTIAL APPLICATIONS

User input parameters are submitted to the program through an ASCII file. The program produces an ASCII output file that summarizes the link configuration and the bit error rate results obtained. Optionally, the program can output signals to data files at various points in the link. The user might use this data to obtain transmit spectrum plots or received constellation diagrams.

INVENTOR(s): R. Young F. Patenaude

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
Copyright			

TITLE: **Satellite Orbit Analysis Program**

CASE # 10049

TECHNICAL ABSTRACT

Satellite Orbit Analysis Program (SOAP) has been developed to help engineers at the Communications Research Centre study various aspects of satellite constellations (e.g. coverage with elevation angle mask, elevation angle rate of change and azimuth rate of change for given sites). The program is capable of analyzing constellations of up to 100 satellites simultaneously and has the built-in ability to animate various satellite properties enabling the user to visualize the behavior of a constellation as time goes on. The SOAP operates on a Macintosh II computer with a mathematical co-processor and at least 1.5 Mbytes of RAM. The program offers a user friendly interface combined with powerful analytical and computational capabilities. Documentation is provided.

POTENTIAL APPLICATIONS

SOAP can be used in any high level study of satellite constellations but has limited use for operational systems in its current version because it does not include effects such as sun and moon perturbations and the effects of atmospheric drag. Therefore, the propagator is accurate for orbits between 300 and 20,000 kilometers. An enhanced version is under development.

INVENTOR(s): M. Caron

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
Copyright			

TITLE: **CRCDAB - Coverage Simulation Software for COFDM Digital Audio Broadcasting (DAB)**

CASE # 10050

TECHNICAL ABSTRACT

The Canadian CRCDAB software is a tool for Broadcasting Engineers who wish to simulate the coverage of a COFDM broadcast transmitter and associates re-transmitters (also called "gap-fillers"). Each transmitter and its antenna are defined independantly. Receiver and system parameters are selected by the user, via a menu-driven WINDOWS-style interface. The coverage plots are output to a video screen, plotter, or Postscript printer,

All code was written for the INTEL 386 32-bit protected mode, operating under a DOS 5.1 extender. It is essential that the user run the programme on either a very fast 386, equipped with INTEL's 80387, or a 486 (33 MHz or better). The video board and monitor must be VGA or SVGA. Extended memory of at least 8 megs is recommended.

POTENTIAL APPLICATIONS

This software is designed for international DAB spectrum planners and for broadcasters who need to offer service to a given coverage area.

As the 1992 WARC Conference has just awarded the 1.472 GHz band for DAB services, the CRCDAB software will have international interest.

INVENTOR(s): G. Chouinard B. Breton
D. MacMillan

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE
Copyright			

TITLE: **Unique Modulation for Radio Frequency Carrier**

CASE # 10052

TECHNICAL ABSTRACT

POTENTIAL APPLICATIONS

INVENTOR(s): R. Datta

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE

TECHNOLOGY TRANSFER OFFICE
(TEL. 613-991-3313)
(FAX 613-998-3185)

TITLE: **Pre-compensated Frequency Modulation (PMF)**

CASE # 10053

TECHNICAL ABSTRACT

POTENTIAL APPLICATIONS

INVENTOR(s): S. Crozier

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE

TECHNOLOGY TRANSFER OFFICE
(TEL. 613-991-3313)
(FAX 613-998-3185)

TITLE: **SEMECS Antenna Technology**

CASE # **10057**

TECHNICAL ABSTRACT

The Communications Research Centre has developed a small, light antenna which minimally affects the esthetic attributes of a vehicle and provides enough gain to meet the TMI/AMSC MSAT requirements for both Northern and Southern coverage medium gain antennas. The antenna is light enough that it can be mounted on the back window of an automobile. It's broad beam allows G/T and EIRP to be maintained under a variety of dynamic automobile conditions (i.e. wind drag, vibrations, acceleration, changes in road angle and conditions).

Current efforts are aimed at developing a diplexor, LNA and power amplifier that will be able to be contained in a 0.5 inch cavity beneath the Semecs. Simulations indicate that the integration of at least the diplexor and LNA is possible in the near term.

FEATURES:
- Low cost and rugged
- Low weight (450 grams for aluminum and 250 grams for plastic)
- Operating temperature ranging from -40° C to 75° C
- Continuous operating hours > 2,500 hrs
- Meets TMI/AMSC northern and southern G/T requirements with a 1dB loss diplexor and 0.6 dB NF LNA
- Can be designed to accomodate an integral diplexor and LNA

POTENTIAL APPLICATIONS

INVENTOR(s): J. Sydor

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE

TECHNOLOGY TRANSFER OFFICE
(TEL. 613-991-3313)
(FAX 613-998-3185)

TITLE: **MSAT DQPSK Modem**

CASE # 10058

TECHNICAL ABSTRACT

This is a voice-activated 6.5 Kbps DQPSK modem designed for the North American MSAT system. It interfaces to a 6.4 Kbps voice codec and a 2.4 - 4.8 Kbps data port. The modulator performs data scrambling, convolution encoding, interleaving and transmit framing. The demodulator performs receive filtering, multisysmbol differential detection, de-interleaving and Viterbi decoding and descrambling. It includes the frequency, symbol timing and frame timing acquisistion functions that are necessary for burst acquisition. The demodulator also performs the frequency, symbol timing and signal health tracking. Implementation consists of a single TMS320C5X DSP. If required, an auxiliary processor can be added to perform the Viterbi decoding function.

FEATURES:

- Transmit portion performs scrambling, interleaving, convolutional encoding, differential encoding, framing and pulse shaping

- Receive portion includes symbol timing acquisition and tracking, frequency acquisition and tracking, receive filtering, frame timing acquisition and tracking, multisymbol differential detection, deinterleaving, decoding and descrambling.

- CRC technical staff available to aid with transfer of technology

POTENTIAL APPLICATIONS:

INVENTOR(s): J. Lodge

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE

TECHNOLOGY TRANSFER OFFICE
(TEL. 613-991-3313)
(FAX 613-998-3185)

TITLE: **Wide Band Channel Measurement System**

CASE # 10059

TECHNICAL ABSTRACT

POTENTIAL APPLICATIONS

INVENTOR(s):

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE

TECHNOLOGY TRANSFER OFFICE
(TEL. 613-991-3313)
(FAX 613-998-3185)

TITLE: **MSL and DVI Shell**

CASE # 10060

TECHNICAL ABSTRACT

POTENTIAL APPLICATIONS

INVENTOR(s): T. Whalen A. Patrick

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE

TITLE: The Dependance of Indoor Radio Channel Multipath Characteristics on Transmit-Receive Range

CASE # 10061

TECHNICAL ABSTRACT

POTENTIAL APPLICATIONS

INVENTOR(s):

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE

TITLE: **19.5 GHz Peltier cooled LNA**

CASE # **10062**

TECHNICAL ABSTRACT

POTENTIAL APPLICATIONS

INVENTOR(s): B. Clark J. Bradley

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE

TECHNOLOGY TRANSFER OFFICE
(TEL. 613-991-3313)
(FAX 613-998-3185)

TITLE: **KA Band Power Amplifier**

CASE # 10063

TECHNICAL ABSTRACT

POTENTIAL APPLICATIONS

INVENTOR(s): B. Clark J. Bradley

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE

TITLE: **Method for Imprinting Index Grating in Core of Optical Fibers and Optical Waveguides**

CASE # 10064

TECHNICAL ABSTRACT

POTENTIAL APPLICATIONS

INVENTOR(s): K. Hill D. Johnson F. Bilodeau B. Malo

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE

TITLE: **The Prevention of forgeries in Personal ID's with Photos**

CASE # 10065

TECHNICAL ABSTRACT

POTENTIAL APPLICATIONS

INVENTOR(s): S. Chow N. Serinken S. Shlien

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE

TITLE: **Relational Grocery Product Reader**

CASE # 10067

TECHNICAL ABSTRACT

POTENTIAL APPLICATIONS

INVENTOR(s): R. Marsh

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE

TITLE: **Photosensitization of Optical Fiber and Silicon-on-silicon Waveguides**

CASE # 10071

TECHNICAL ABSTRACT

POTENTIAL APPLICATIONS

INVENTOR(s): CRC: K. Hill, D. Johnson, F. Bilodeau, B. Malo, J. Albert
NTT (Japan): M. Kawachi, Y. Hobino, M. Abe

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE

TITLE: **Polarization Diversity Helical antenna**

CASE # **10072**

TECHNICAL ABSTRACT

POTENTIAL APPLICATIONS

One emerging area of application is the Digital Radio Broadcast where the signal may be broadcast simultaneoulsy both from the geostationary satellites and terrestrial transmitters. The user may be a passenger in a car with an appropriate receiver. The satellite will broadcast circularly polarized signal and the terrestrial transmitters will be vertically polarized. The polarization diversity antenna described here will maximize both receptions and since it is just a single antenna its fabrication costs will be lower than the currently available designs based on composite antennas. The helical geometry is selected to be similar to the whip antenna that is already accepted for vehicular applications. However, the unit can also be used in portable Digital Radio Broadcast systems or other applications requiring such polarization diversity antenna. Note that by modifying the helix pitch angle, its beam elevation can be raised or lowered, making the application of the antenna more flexible.

INVENTOR(s):

PROTECTION

TYPE	COUNTRY	NUMBER	ISSUE DATE