Patent Abstracts

These Patent Abstracts of recently issued patents are intended to provide the minimum information necessary for readers to determine if they are interested in examining the patent in more detail. Complete copies of patents are available for a small fee by writing: U.S. Patent and Trademark Office, Box 9, Washington, D.C. 20231.

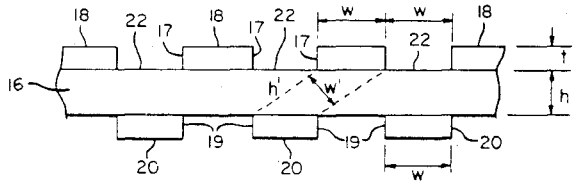
4,680,557 July 14, 1987

Staggered Ground-Plane Microstrip Transmission Line

Inventor: Peter M. Compton.
Assignee: Tektronix, Inc.
Filed: Apr. 22, 1985.

Abstract—A microstrip transmission line comprises a plurality of signal-carrying lines disposed along a dielectric ribbon and separated by a predetermined spacing. Ground-plane conductors are disposed on the opposite side of the ribbon in staggered relation to the signal-carrying lines such that the ground-plane conductors occupy spaces corresponding to the gaps between adjacent signal-carrying lines. This arrangement lowers the capacitance and raises the impedance of the transmission line while maintaining high signal line density.

3 Claims, 7 Drawing Figures



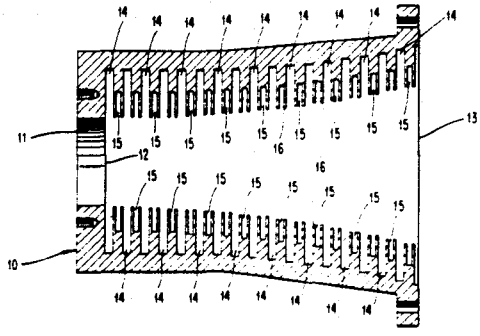
4,680,558 July 14, 1987

Corrugated Transition Device for Use Between a Continuous and a Currugated Circular Waveguide with Signal in Two Different Frequency Bands

Inventors: Subir Ghosh and Aluízio P. Junior.
Assignee: Telecomunicacoes Brasileiras S/A-Telebras.
PCT Filed: Dec. 27, 1984.

Abstract—A transition device achieves transformation of the signal carrier mode of a continuous wave guide, into the hybrid mode, the corresponding mode for carrying signals in corrugated structures, by employing a tapered waveguide transition of circular cross-section having dual-depth circumferential slots in the interior boundary surface thereof. The transition device utilizes a mutual resonance property of the slots at the port which connects to a continuous waveguide to achieve satisfactory operation in two frequency bands. At the port which is connected to a corrugated horn, the quarter wavelength self resonance of the individual slots provides the desired hybrid mode under balanced hybrid condition in these two bands. A gradual transition of the electrical characteristics is achieved along the length of the transition device through an adjustment of slot dimensions. Excitation of higher order spurious modes is maintained at a low level when properly chosen cross-sectional dimensions are considered along the length of the transition device.

9 Claims, 3 Drawing Figures



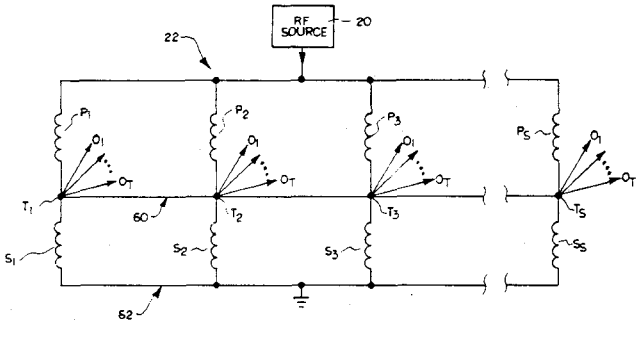
4,680,559 July 14, 1987

RF Splitter Circuit

Inventor: Hilmer J. Swanson.
Assignee: Harris Corporation.
Filed: Mar. 14, 1985.

Abstract—A signal dividing network is provided as an RF splitter for use in supplying N load devices of varying impedances with RF signals such that each of the N signals is of essentially the same magnitude and phase. The splitter includes a plurality of step-down auto transformers, each having a primary and a secondary defining a series circuit between a common RF source and ground. An output terminal is defined as the midpoint of the primary and secondary windings on each transformer and the output terminals are connected together in common whereby all of the primary windings are connected in parallel and all of the secondary windings are in parallel. Each output terminal has several outputs connected thereto, such that the splitter has a total of N outputs for driving N load devices.

8 Claims, 4 Drawing Figures



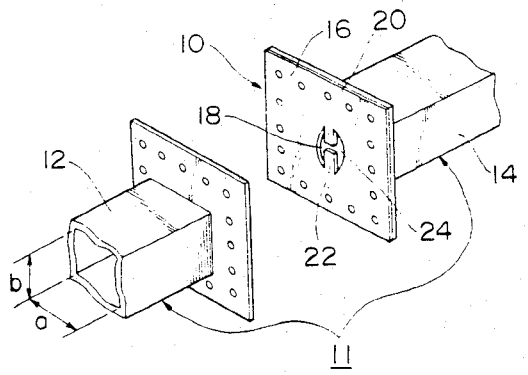
4,680,561 July 14, 1987

Microwave Waveguide Filter Having a Metal Plate Which Includes a Resonant Aperture Therein

Inventor: Tadao Shirai.
Assignee: Nec Corporation.
Filed: May 29, 1985.

Abstract—A thin plate member of electrically conductive material is disposed within a rectangular waveguide. The plate member has the thickness less than one tenth of the wavelength of a frequency to be suppressed, an opening whose maximum dimension is less than the length of the short side of the waveguide, and a gap formed between two opposite projections extending from the edge of the opening. The plate member is arranged, in the said rectangular waveguide, parallel with the electric field and perpendicular to the magnetic field.

3 Claims, 5 Drawing Figures



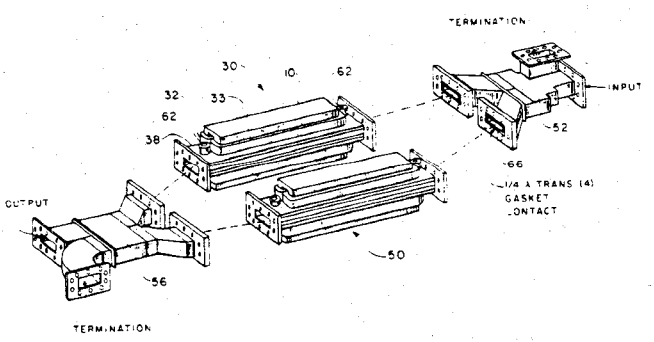
4,682,126 July 21, 1987

Electromagnet for Programmable Microwave Circulator

Inventors: Walter E. Milberger, Joel R. Cohen, and Leonard Dubrowsky.
Assignee: The United States of America as represented by the Secretary of the Air Force.
Filed: June 1, 1984.

Abstract—A "Spacercore" design is used to provide the cores of the electromagnets which are used to bias ferrite slabs in phase shifters of a high power RF attenuator. The phase shifters require a given flux to provide a phase shift from zero to 90°. With laminations of high permeability silicon steel, the core weight may be substantially reduced by including a filler comprising spacers of nonmagnetic material (such as lightweight transformer pressboard). With 14 mil silicon steel laminations and 64 mil spacers, this construction provides a core which weighs 25 percent of a full ferrite core for the same flux density.

4 Claims, 13 Drawing Figures



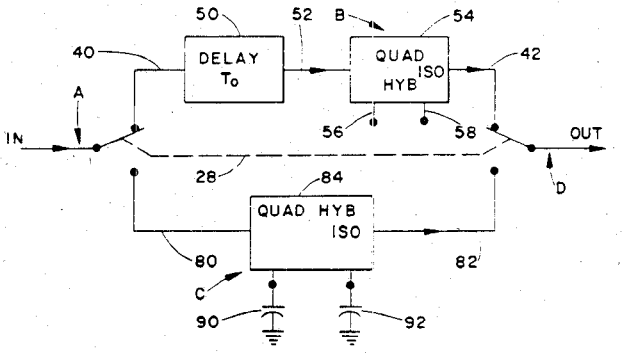
4,682,128 July 21, 1987

Phase Shifter

Inventors: Robert W. Sproul and Michael F. Ponzo.
Filed: Jan. 22, 1986.

Abstract—A phase shifter with a phase shift primarily independent of frequency includes first and second quadrature hybrids, a delay and a ganged switch. A first path includes an input into the delay, the delay output being connected into the first quadrature hybrid. The corresponding isolated terminal of the first quadrature hybrid forms the output of the first path. A second path includes an input to the second hybrid quadrature with a terminal thereof as an output. Two remaining terminals of the second quadrature hybrid are taken to a common ground through two capacitors of preselected value. The ganged switch selectively engages a system input to either the inputs of the first path or the second path and simultaneously engages a system output to the outputs of the first path or the second path.

20 Claims, 6 Drawing Figures



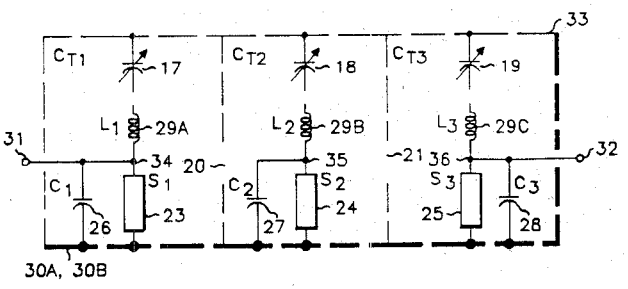
4,682,131 July 21, 1987

High-Q RF Filter with Printed Circuit Board Mounting Temperature Compensated and Impedance Matched Helical Resonators

Inventor: Colin J. May.
Assignee: Motorola Inc.
Filed: June 7, 1985.

Abstract—A helical filter is disclosed which includes a ground plane having microstrip transmission line segments to which a respective helical resonator coil is connected at the high impedance end thereof. A discrete capacitor is connected in parallel with each transmission line. A housing is provided with individual resonator compartments which effect associated distributed capacitance with the resonators themselves, which capacitance may be adjusted by included tuning screws. Conductors are connected to and form an integral part of a given two of said transmission lines and serve as the input and output for the helical filter. The transmission line and discrete capacitor pair provides the necessary impedance match, while the capacitor itself facilitates temperature compensation and frequency range selection.

13 Claims, 5 Drawing Figures



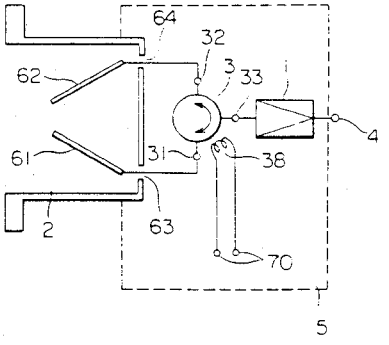
4,683,440 July 28, 1987

High-Frequency Amplifier Device

Inventor: Yoshihiko Yoshikawa.
Assignee: Mitsubishi Denki Kabushiki Kaisha.
Filed: Feb. 27, 1986.

Abstract—A high-frequency amplifier deivce according to this invention comprises a high-frequency amplifier portion, a high-frequency input portion which is formed of a waveguide and which can transmit polarized signals orthogonal to each other, two detector portions which are inserted in the waveguide of the input portion and which respectively and independently detect the polarized wave signals orthogonal to each other, an irreversible circuit to which the polarized wave signals detected by the detector portions are individually input and which selectively and switching delivers one of the polarized wave signals to the high-frequency amplifier portion and returns the other polarized wave signal to the input portion, and a switching control mechanism for switching and controlling transmitting directions of the irreversible circuit in response to a control signal externally applied.

3 Claims, 9 Drawing Figures



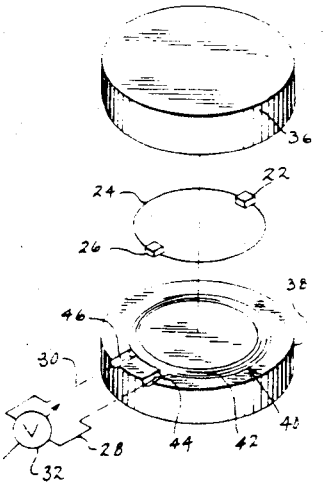
4,683,447 July 28, 1987

Varactor Tuning Circuit for Dielectric Resonator Stabilized Oscillator

Inventors: Ashok K. Talwar, William E. Poole, Jr., and Richard B. Steinkolk.
Assignee: Eaton Corporation.
Filed: Dec. 1, 1986.

Abstract—Tuning varactor circuitry is disclosed for a dielectric resonator stabilized oscillator (2). A varactor diode (22) is electrically connected in a loop (24) with an RF bypass capacitor (26), and the voltage across the diode is varied. In a first embodiment, first and second dielectric substrates (36,38) face each other along the plane of the loop (24), with the loop (24) between. In another embodiment, the loop (24) is around a peripheral side wall (52) of the dielectric resonator substrate (46). In another embodiment, the loop (24) is formed on the same surface (54) of a microstrip circuit substrate (56) with a transmission line (10).

4 Claims, 5 Drawing Figures



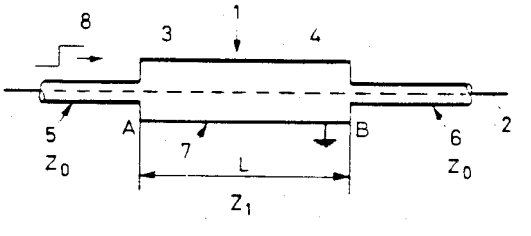
4,683,450 July 28, 1987

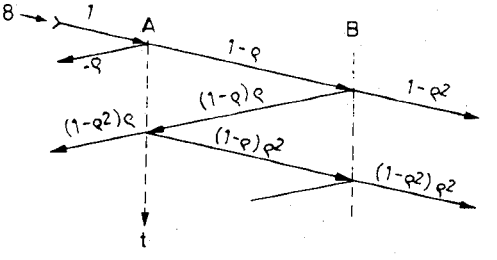
Line with Distributed Low-Pass Filter Section Wherein Spurious Signals are Attenuated

Inventors: Jean-Joseph Max and Arvind Shah.
Assignee: Feller AG.
Filed: June 29, 1983.

Abstract—For suppression of high-frequency spurious signals (noise) present on an electrical transmission line, the line incorporates at least one section comprising a distributed low-pass filter. This section is constructed so that its wave impedance (Z_1) has a different value than the wave impedance (Z_0) of the neighboring line sections. This filter line section additionally provides considerable dielectric losses and/or skin effect losses. At both ends of the filter line section, at which the wave impedance changes, multiple reflections arise that attenuate the high-frequency spurious signals (noise). The dielectric or skin effect losses produce strong attenuation of the undesired resonances that arise from the reflections, as well as further attenuation of spurious signals in the highest frequency region.

11 Claims, 12 Drawing Figures





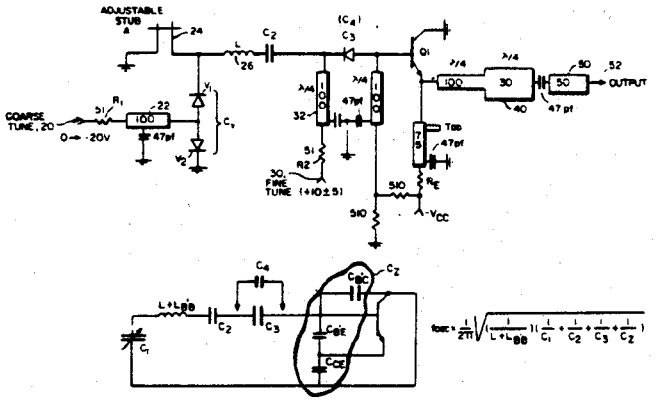
4,684,904 Aug. 4, 1987

Low-Phase Noise Two Port Voltage Controlled Oscillator

Inventors: Grant H. Watkins and Lester K. Staley.
Assignee: The United States of America as represented by the Secretary of the Air Force.
Filed: Jan. 6, 1986.

Abstract —A low noise two port voltage controlled oscillator having a coarse tuning circuit serially connected to an inductor to form a resonant circuit. A fine tuning circuit is serially connected between the resonant circuit and the input to the amplifier. A large capacitance series silicon varactor minimizes noise at the frequency of operation while optimizing the coarse tuning range.

9 Claims, 12 Drawing Figures



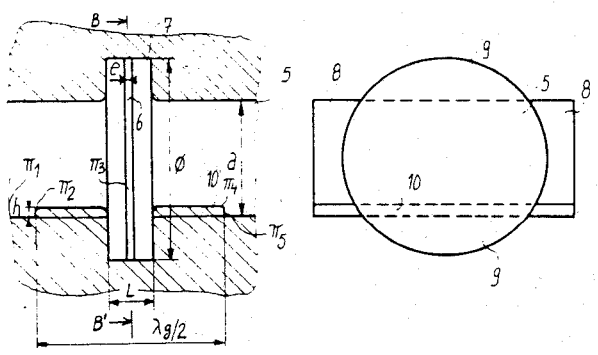
4,684,908 Aug. 4, 1987

Circular Window for Ultra-High Frequency Waveguide

Inventors: Jean C. Kuntzmann and Jacques Tikes.
Assignee: Thomson-CSF.
Filed: Jan. 9, 1985.

Abstract —The present invention relates to a circular window for an ultra-high frequency waveguide. This window is constituted by a circular plate or wafer made from a dielectric material mounted in a waveguide section, connected on either side of a waveguide operating in a frequency band centered around the central frequency. The diameter of the circular plate is chosen so as to reject the ghost modes outside the frequency band. The length of the circular guide section is chosen so that the reactance of the assembly constituted by the plate and the circular guide is canceled out for the central frequency. It also comprises a half-wave impedance transformer, whose height is chosen so as to bring about the matching in the operating frequency band. The window associated with rectangular waveguides is more particularly used with tubes for telecommunications.

11 Claims, 12 Drawing Figures



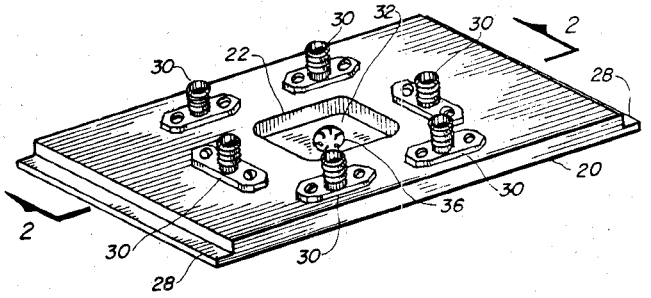
4,686,463 Aug. 11, 1987

Microwave Probe Fixture

Inventor: John K. Logan.
Filed: Dec. 24, 1984.

Abstract —A fixture having a header plate (20) in rectangular shape with a notch (28) on each end and an aperture (22) in the middle defined as a through hole. A plurality of microwave connectors (30) are located on the top surface of the header plate (20) adjacent to the aperture and penetrate through the body with the connector extended contact planar with the bottom. A substrate (32) of dielectric material with a ground plane on one side and a plurality of striplines (34) on the other is attached into a recess peripherally positioned on the bottom side of the aperture (22). The striplines (34) are joined to the connectors (30) on one end and to individual probe needles (38) with angular tips on the other near the midmost point. A centrally located access opening (36) in the substrate (32) allows visual indication of the probe needles (38) for positioning upon node points and inspection points on a microwave semiconductor wafer under test. The device allows a flowpath for microwave signals from the needle tips through the striplines (34) to the connectors (30) for testing purposes.

13 Claims, 12 Drawing Figures



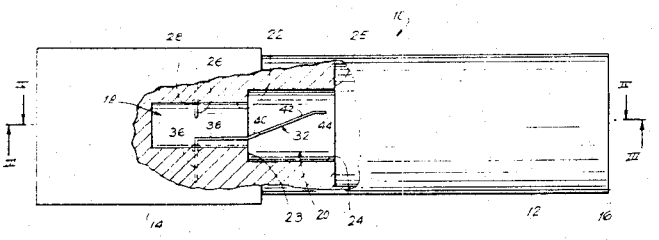
4,686,491 Aug. 11, 1987

Dual Probe Signal Receiver

Inventor: H. Taylor Howard.
Assignee: Chaparral Communications.
Filed: Oct. 22, 1985.

Abstract —A high-frequency signal receiver has two separate probes arranged within a waveguide for receiving both modes of an orthogonally polarized signal. A first probe protrudes directly into a rectangular cavity located at the receiving end of a circular waveguide and a second probe is specially shaped to employ the walls of the rectangular cavity and the circular waveguide as a ground plane, thereby to form a transmission line connected to a receiver probe portion arranged in the circular waveguide that receives the other of the orthogonal polarization not received by the first probe but which is reflected outwardly by the rectangular cavity.

11 Claims, 6 Drawing Figures



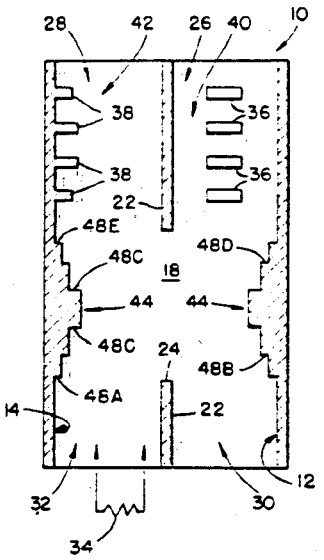
4,686,493 Aug. 11, 1987

Wideband Short Slot Hybrid Coupler

Inventors: Donald C. D. Chang and Mon N. Wong.
Assignee: Hughes Aircraft Company.
Filed: Mar. 27, 1986.

Abstract—A waveguide hybrid coupler is formed with a pair of waveguides of rectangular corss-section and sharing a common sidewall. An aperture in the sidewall provides for the coupling of electromagnetic energy between a first of the waveguides and a second of the waveguides. An input terminal is located at an end of the first waveguide. A pair of stepped, multitiered abutments are disposed on the outer widewalls of the waveguides opposite the coupling aperture. The dimensions of the abutment steps are selected to stagger-tune the frequency response of the coupler to achieve wideband operation.

11 Claims, 11 Drawing Figures



4,686,494 Aug. 11, 1987

Cavity Resonator Coupling-Type Power Distributor/Power Combiner Comprising Coupled Input and Output Cavity Resonators

Inventors: Yoshiaki Kaneko, Toshiyuki Saito, and Naofumi Okubo.
Assignee: Fujitsu Limited.
Filed: Jan. 18, 1984.

Abstract—A cavity resonator coupling-type power distributor/power combiner can be used as a distributing amplifier or a combining unit. A first cavity resonator, having a single coupling terminal, and a second cavity resonator having a plurality of coupling terminals, are coupled by a coupling window or a coupling rod. As a result, a wide bandwidth of microwave electric power can be distributed or combined.

25 Claims, 10 Drawing Figures