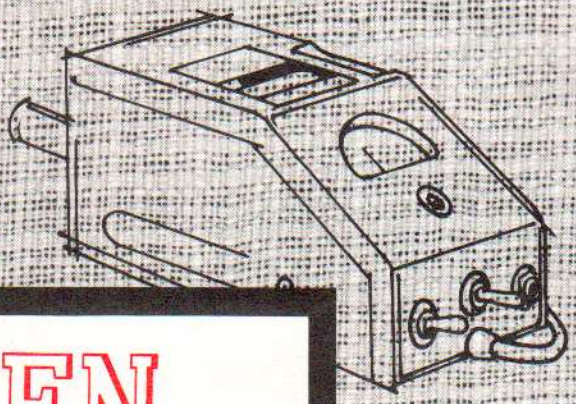
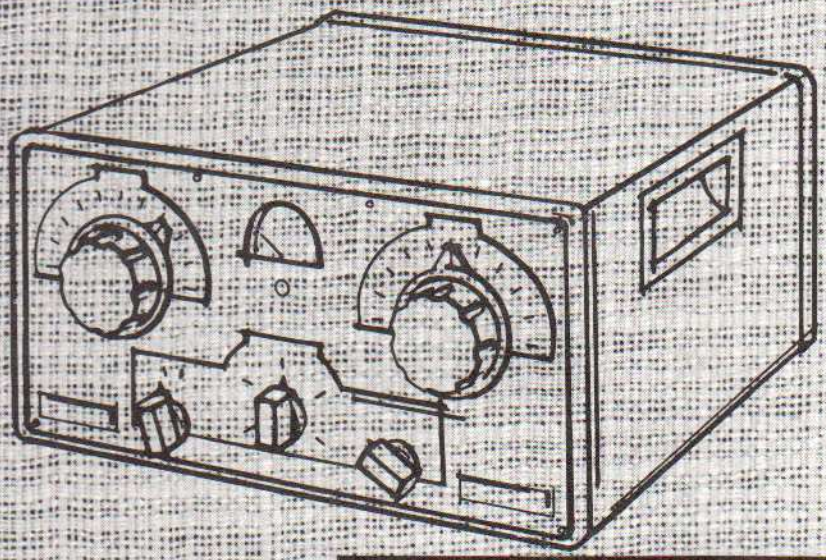
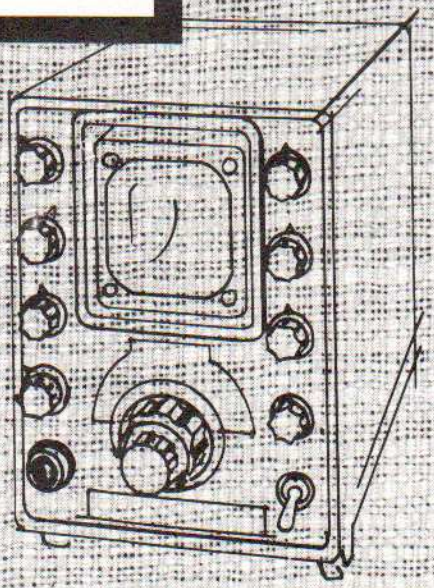
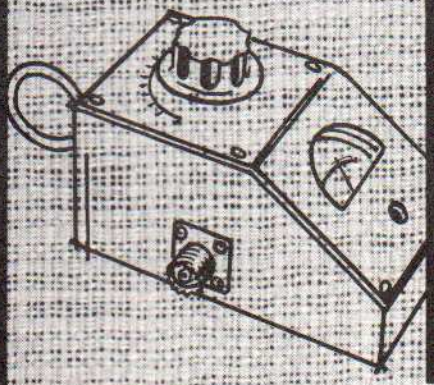


JAMES MILLEN

MANUFACTURING COMPANY, INC.

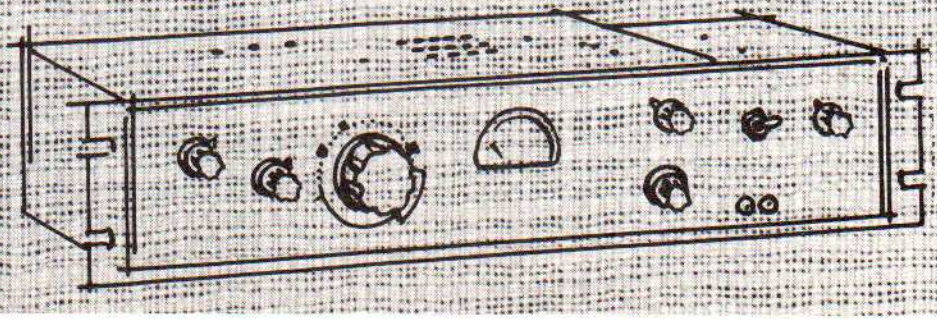






AMATEUR RADIO EQUIPMENT

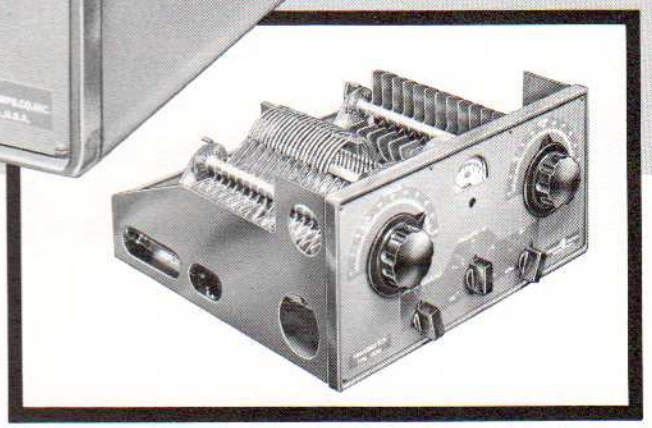
"Designed for Performance"®



AMATEUR RADIO

TRANSMATCH

CONVERTS IMPEDANCE OF ANY 15 TO 500 OHM COAXIAL FED ANTENNA SYSTEM TO 50 OHMS



The **No. 92200 Transmatch** is a 2 KW band-switching, adjustable r.f. transformer with a reflectometer as the indicator. The **Transmatch**, inserted between a transmitter and a transmission line, will convert the impedance of any 15 to 500 ohm coaxial fed antenna system to 50 ohms so that the transmitter may, at all frequencies, work into the impedance for which it was designed.

Most transmitters have pi-network tank circuits designed to work into a 50 ohm load. If the actual transmitter load is other than 50 ohms the transmitter cannot be loaded properly for optimum operation.

Multi-band beam antennas or trap dipoles are fed with 50 ohm coaxial cable, however, no antenna designed to cover a band of frequencies will look like a pure resistance of 50 ohms across even a portion of the band. There will be a mismatch as frequency is changed within a band. The antenna height, proximity to nearby objects, and its impedance at resonance affect the match or mismatch between the antenna and the transmission line. The match or mismatch between the antenna and the transmission line determines the impedance the transmission line presents to the transmitter. When the antenna is not matched into the 50 ohm transmission line, the transmitter load will not be 50 ohms even though 50 ohm coaxial cable is used. This means the transmitter will not be working into 50 ohms and will not do the job for which it was designed. With the **Transmatch** this situation is corrected.

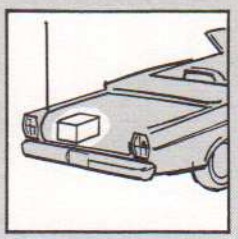
The **Transmatch** is a single-ended or unbalanced unit intended to match single-ended transmitters to coaxial transmission lines. It can match any antenna system between 15 and 500 ohms to a transmitter impedance of 50 to 70 ohms. At most frequencies the antenna system impedance may be as low as 10 ohms or as high as 1000 ohms and still the **Transmatch** will match it to the 50 ohm transmitter output. It also has provisions for coupling the No. 90932 Modulation Monitor to the transmitter output.

TECHNICAL SPECIFICATIONS

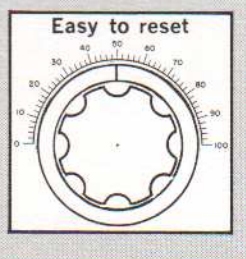
Input impedance (transmitter) 50 to 70 ohms single-ended.
Output impedance (transmission line) 15 to 500 ohms coaxial: 10 to 1000 ohms at most frequencies.
Frequency range — 3.5, 7, 14, 21, 28 MC amateur bands band-switched.
Power handling capability — 2 KW peak.
Indicator — 50 ohm Reflectometer using a 200 microampere meter.
Desk top cabinet size: 7" H. x 14" W. x 13⅝" D.
Weight: 17 lbs.

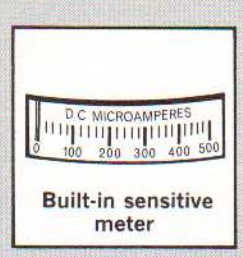
TRANSMATCH JUNIOR

AMATEUR RADIO



Small, lightweight for mobile use.





Built-in sensitive meter

Easy mobile installation (2 bolts)

The **No. 92201 TRANSMATCH JUNIOR** is a 300 watt band-switching r.f. transformer with a reflectometer as the indicator. The **TRANSMATCH JUNIOR,** inserted between a transmitter and a transmission line, will convert the impedance of any 10 to 500 ohm coaxial fed antenna system to 50 ohms so that the transmitter may, at all frequencies, work into the impedance for which it was designed.

Most transmitters are designed to work into a 50 ohm load and lose efficiency working into other than a 50 ohm load. The impedance of any antenna varies as the frequency varies within a band and this causes a mismatch between the antenna and the 50 ohm transmission line. With this mismatch the transmitter works into other than the intended 50 ohm load and therefore loses efficiency. The **TRANSMATCH JUNIOR** converts this and any other mismatch in the antenna system into a 50 ohm load so that the transmitter will be properly loaded and work at peak efficiency at all frequencies.

TECHNICAL SPECIFICATIONS

Input impedance (transmitter) 50 to 70 ohms single-ended.
Output impedance (transmission line) 10 to 500 ohms coaxial: 5 to 1000 ohms at most frequencies.
Frequency range — 3.5, 7, 14, 21, 28 MC. amateur bands band-switched.
Power handling capability — 300 watts peak.
Indicator — 50 ohm reflectometer using a 500 microampere meter.
Cabinet size: 7″ W. x 4¾″ H. x 9″ D. (including knobs)
Weight: 6 lbs.

The **TRANSMATCH JUNIOR** is a lower power, lower cost, version of the **No. 92200 2 KW TRANSMATCH.** It is small and lightweight and therefore ideal for mobile use as well as for stationary use.

MODULATION MONITORS

NO. 90932 CATHODE-RAY TRANSMITTER MONITOR

The **No. 90932** is designed for checking and monitoring amateur transmitters and incorporates features such as tuned ham-band r.f. input, send-receive blanking, and audio phase correction that are not found in scopes built for general measurement work.

This complete 'scope has built-in, link-coupled tuned circuits covering all amateur bands, 3.5 through 54 mc. It displays the r.f. envelope and/or the trapezoidal monitoring pattern of SSB or AM transmitters. The monitor shows the linearity or non-linearity of Class B r.f. amplifiers, the keying characteristic of CW transmitters, parasitic oscillation, and r.f. output. Since the monitor is quite sensitive, it may be used as a neutralization indicator. The cathode ray beam responds instantly and provides the information that moving coil meters cannot provide. It gives a continuous, complete picture of the overall performance of the transmitter.

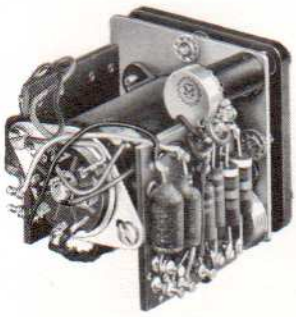
The overall power supply voltage is 1040 VDC which is high enough to provide a very sharply focused trace with good intensity, and still low enough to provide excellent deflection sensitivity. The beam is blanked during standby, by the operation of a 6.3 volt relay which is controlled by the station master send/receive switch or VOX relay.

For desk top readiness, the monitor is tested for immediate operation and is simple to use.

SPECIFICATIONS

Cathode ray tube: Type 2BP1
Blanking: Automatic or manual
Horizontal width: Controlled by attenuator
Display: Envelope — line frequency sine wave sweep. Trapezoid — external input to horizontal attenuator.
Frequency: 6 bands — separate coil for each band 4-7-14-21-28-50 mc. Tuning capacitor to adjust vertical deflection.
Vertical input: Link-coupled pick up loop to be loosely coupled to modulated r.f. output of transmitter.
Sensitivity: Usable vertical deflection when pick-up loop is coupled to a lower power source such as a Grid Dip Meter.
Dimensions: 7¼" H. x 5½" W. x 11" D. overall. **Weight:** 7 lbs., 14 ozs. **Power requirements:** 105 to 125 volts 50/60 cycles.

MINIATURE MODULATION MONITOR 'SCOPE

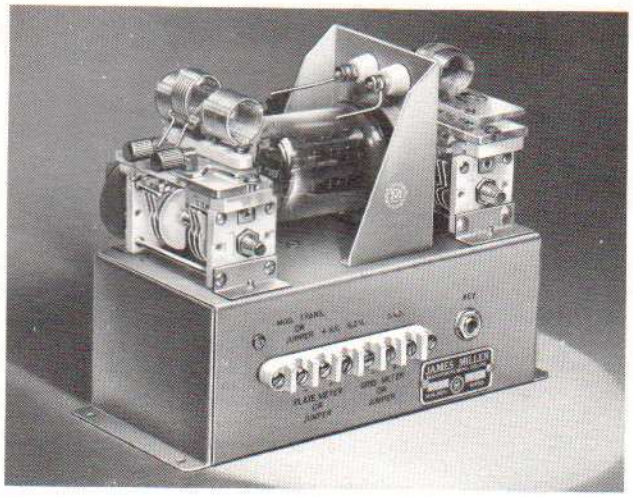


The **No. 90901** is a panel mounting cathode ray monitor 'scope designed to build into your rig and provide a continuous indication of the modulation percentage of the transmitter. Magnitude, phase displacement, wave shape, etc. are constantly visible on the 1-inch 1CP1 fixed-focus tube. Complete with bezel and panel control of intensity, vertical centering and horizontal centering. Panel bezel matches in size and type the standard 2" square meters. Power supply: 600 to 950 VDC @ 3.2 MA. 6.3 VAC @ 0.6A. Overall size: 2½" H. x 2⅝" W. x 4⅝" D. including knobs. It can be used with your present power supply or with plug-in unit listed below.

PLUG-IN HIGH VOLTAGE POWER SUPPLY

The **No. 90202** is a compact unit available for the **No. 90901** 'scope where it may be inconvenient to use your present power supply. Supplies: 750 VDC at 3 MA. and 6.3 VAC at 600 MA. 117 VAC, 50-60 cycle input. Easy to install, it has octal plug for input and output. Entire assembly including rectifier is encapsulated. Size: 4⅝" H. x 1⅞" x 2⅛".

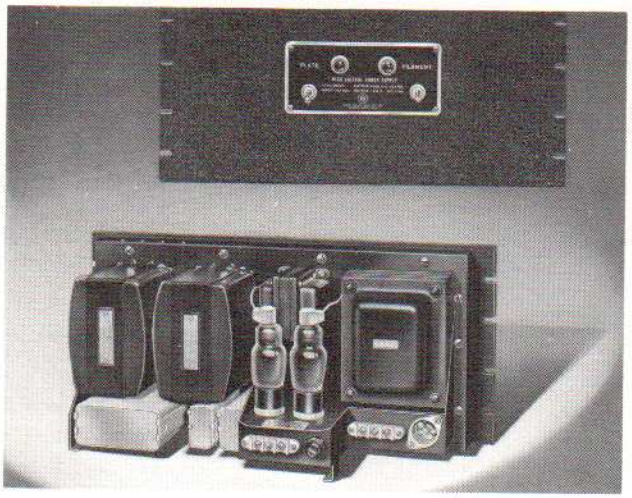
V.H.F. AMPLIFIER AND POWER SUPPLIES



V.H.F. AMPLIFIER

The **No. 90811** is a physically small unit capable of a power output of 70 to 85 watts on 'phone or 87 to 110 watts on CW on 20, 15, 10, 6 or 2 meter amateur bands. Provision is made for quick band shift by means of the No. 48000 series VHF plug-in coils. The **No. 90811** unit uses either an 829-B or 3E29 tube in a push-pull circuit. External power supply, modulator, and grid and plate milliameters may be connected to a terminal board on the rear of the unit.

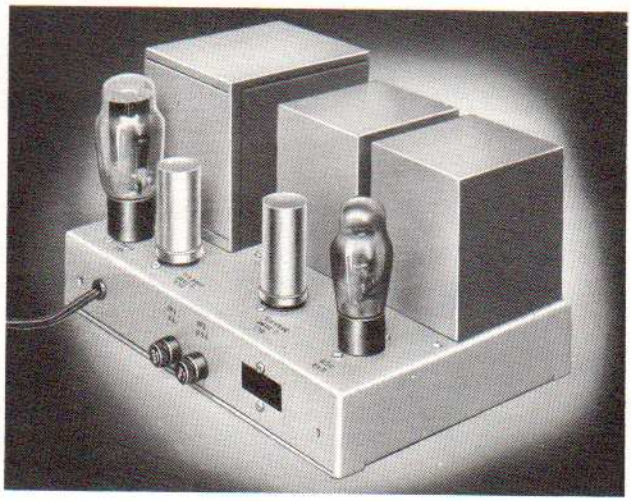
The **No. 90811** VHF Amplifier may be high level amplitude modulated by the No. 90831 Modulator shown at the left. A No. 90281 High Voltage Power Supply will supply the high voltage power for **both** the No. 90811 VHF Amplifier and the No. 90831 Modulator.



HIGH VOLTAGE POWER SUPPLY

The **No. 90281** is a general purpose, high voltage power supply with an extremely effective filtering network designed to provide high voltages to the Millen No. 90801 Exciter-Transmitter, No. 90831 Modulator, No. 90811 VHF Amplifier, and other equipment requiring an output of 550 to 700 VDC @ 235 ma. This "add-on" power supply can be rack mounted in a standard 19" relay rack or rack cabinet, or used on a bench at the convenience of the amateur operator.

SPECIFICATIONS: DC output 550 to 700 volts with maximum current of 235 ma. In addition, an AC filament power of 6.3 volts at 4 amps is also available. Uses 2 — 816 mercury vapor rectifiers and incorporates a two-section filter which results in excellent regulation and very low ripple. Size: 8¾" H. x 19" W. x 8" D. Weight 56 lbs. Completely wired and tested.



LOW VOLTAGE POWER SUPPLY

The **No. 90201** is ideal for supplying the low voltages when a separate low voltage power supply is needed. Its multiple outputs include 250 volts @ 115 ma. unregulated, 105 volts @ 35 ma. regulated, bias voltage of minus 105 volts, 6.3 volts filament power at 4.2 amps. This one low voltage power supply will supply the low voltage for both the 90801 Transmitter and the 90831 Modulator as well as the bias voltage and heater voltages for the modulator.

The **No. 90201** is a compact, uncased, regulated and general purpose power supply for table use, or for incorporation as an integral part of larger ham equipment. Completely wired and tested.

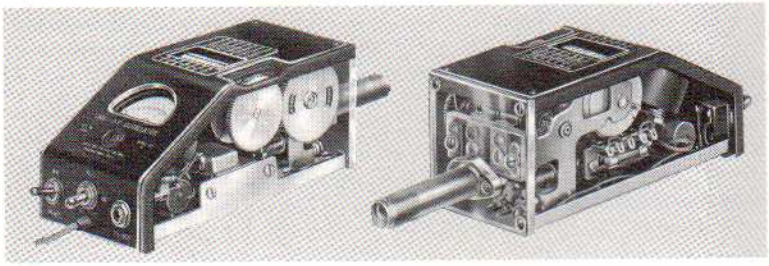
AMATEUR RADIO

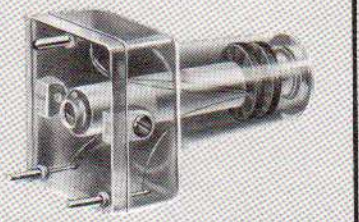
GRID DIP METER

ONE HAND OPERATION

CALIBRATED DIAL

DESIGNED FOR BATTERY USE





ACCESSORIES FOR USE WITH MILLEN 90651 GRID DIP METER

NO. 90651 IN PROTECTIVE POLYPROPYLENE CARRYING CASE TO HOLD COIL/PROBES WITH YOUR GRID DIP METER

The **Millen No. 90651** Grid Dip Meter is now available in a convenient polypropylene carrying case which keeps the coil/probes with the Grid Dip Meter and protects both.

Frequency coverage is 1.7 to 300 mc. with the seven coil/probes furnished. Additional coils for extending the calibration to 225 KC. are available.

The Millen Grid Dip Meter is a calibrated stable RF oscillator unit with a meter to read grid current. The frequency determining coil is plugged into the unit so that it may be used as a probe.

This instrument is complete with a built-in transformer type A.C. power supply and internal terminal board to provide connections for battery operation where it is desirable to use the unit on antenna measurements and other uses where A.C. power is not available. Compactness has been achieved without loss of performance, convenience of use, or ease of reading the dial accurately. The incorporation of the power supply, oscillator, probe, and easily read dial into a single hand-held unit provides a convenient device for checking all types of circuits. The indicating instrument is a rugged 2 inch meter with easy-to-read scale. The calibrated dial is a large 205° drum dial which provides seven direct reading scales, plus an additional universal scale, all with the same length and readability. Each frequency range has its individual plug-in coil/probe completely enclosed in a molded contour fitting polystyrene case for assurance of permanence of calibration as well as to prevent any possibility of mechanical damage or of unintentional contact with the components of the circuit being tested. The coils and dial scales are color coded.

ADDITIONAL INDUCTORS FOR LOWER FREQUENCIES

No.		No.	
46702	— 925 to 2000 KC	**46704**	— 325 to 600 KC.
46703	— 500 to 1050 KC.	**46705**	— 220 to 350 KC.

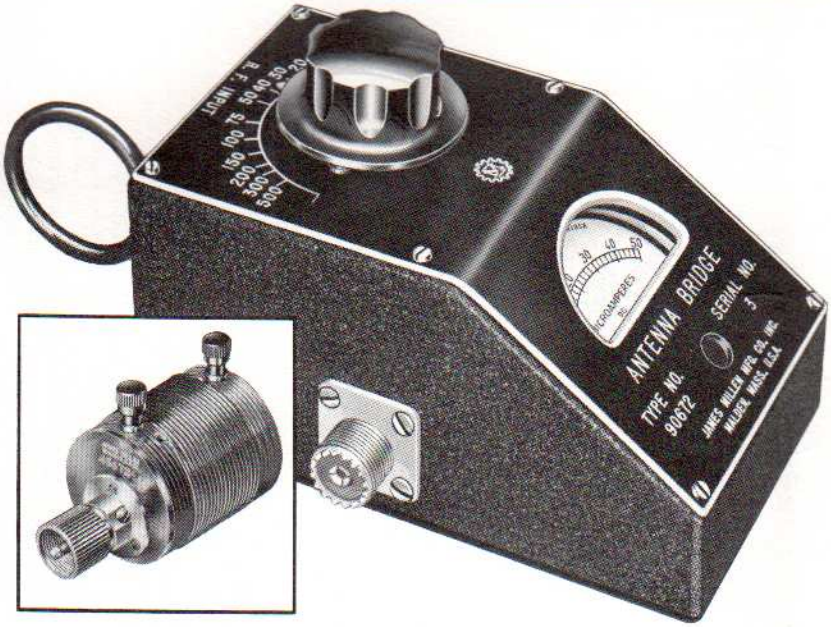
TONE MODULATOR

The **No. 90751 Tone Modulator** is a small package containing a transistor audio oscillator and its mercury battery, which plugs into the phone jack of a Grid Dip Meter to modulate the signal at approximately 800 cycles for applications requiring a modulated signal. Dimensions: 2¾" x 1 5/16" x 1 5/16".

GRID DIP METER PROBE

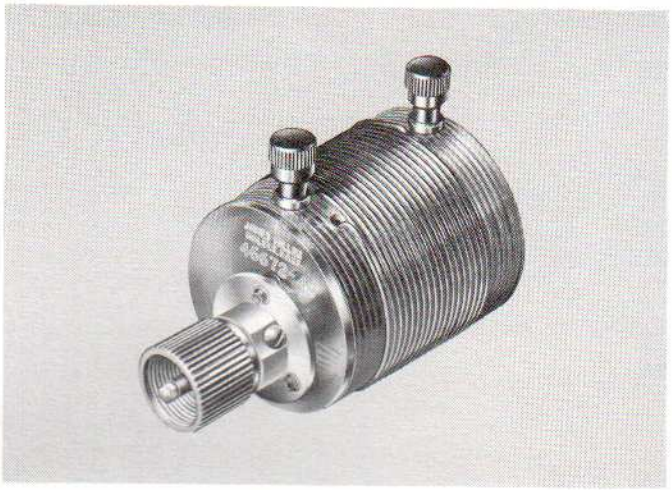
The **No. 46721 Probe** is used under many conditions where it is difficult to couple directly to the unknown circuit.

ANTENNA BRIDGE AND ACCESSORIES



ANTENNA BRIDGE

The **No. 90672** is an accurate and sensitive bridge for measuring impedance in the range of 5 to 500 ohms for unbalanced impedance and 20 to 2000 ohms for balanced impedance (using the 4:1 balun illustrated) at radio frequencies up to 140 mc. The variable element in this bridge is an especially designed differential capacitor of high accuracy and permanence of calibration over a wide range of frequencies. This bridge is entirely unique in design as compared to others designed for the same type of service, because it employs no variable resistors. The **No. 90672** is designed to use a Grid Dip Meter, such as the Millen **No. 90651** as a source of r.f. signal. The Bridge may be used to measure antenna radiation resistance, antenna resonance, transmission line impedance, standing wave ratio, receiver input impedance and many other r.f. impedances. Size: 5⅝" L. x 3⅛" W. x 3⅞" H. Weight: 1⅝ lbs.

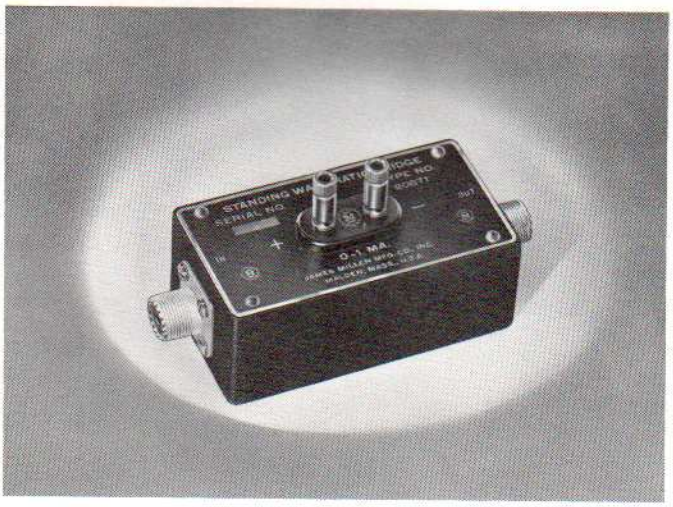


FIXED TUNED BALUNS

The **No. 46672** Baluns are designed for use with the Millen 90672 Antenna Bridge and medium power transmitters. Each of the Baluns (one each for 10-15-20-40-75/80 meter bands) is an accurate 2-to-1 turns ratio, high Q auto transformer with the residual reactances tuned out and with very tight coupling between the two halves of the total winding. The points of series and parallel resonance are selected so that each Balun provides an accurate 4-to-1 impedance ratio over the entire band of frequencies for which it was designed. Accuracy is ±5%. Size: 3⅜" L. x 2⅝" including binding posts x 2". Weight 5 ozs.

PLUG-IN AUDIO CLIPPER

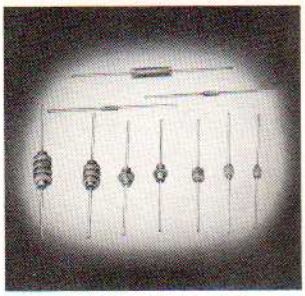
The **No. 75016** is a small, plug-in symmetrical type clipper used between the receiver and headphones to clip noise for CW reception as well as for AM or SSB, or it may be used to clip a sine wave input to form a square wave output. Effective as a CW noise clipper because both positive and negative noise peaks are clipped at a fixed level; also it is an automatic gain control. On AM or SSB 'phone reception signal levels greater than 2.68 volts peak to peak are clipped. Dimensions: 2¾" x 1 5/16" x 1 5/16".



STANDING WAVE RATIO BRIDGE

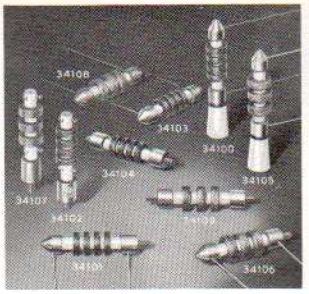
The **No. 90671 SWR Bridge** provides easy and inexpensive measurement of standing wave ratio on 52 or 75 ohm transmission lines such as RG-8U, RG-54/U or RG-13/U coaxial lines. It insures the most effective use of a low pass filter and antenna coupler for the ultimate in TVI suppression. It is an r.f. bridge in which the resistance of the antenna transmission line and antenna, as seen by the transmitter, is compared to a 51 ohm resistor. As assembled the bridge is set up for 52 ohm line. A calibrated 75 ohm resistor is mounted inside the case for direct substitution in the circuit when 75 ohm line is used. The SWR Bridge may be used with good accuracy from 1 mc. to 15 mc., and will provide measurements up to frequencies of 150 mc. Has connections for use with an external 0-1 ma. meter.

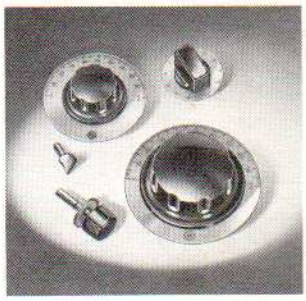
COMPONENTS



James Millen Mfg. Co., Inc. manufactures a complete line of amateur radio components.

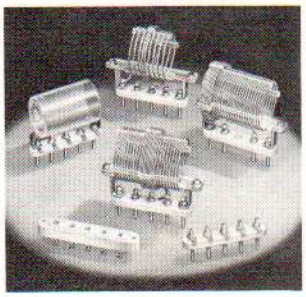
These components are some of the segments of amateur radio that are covered by Millen catalogs. Whatever the amateur needs, **James Millen Mfg. Co., Inc.** produces it whether it is radio components, lab equipment, or amateur equipment.





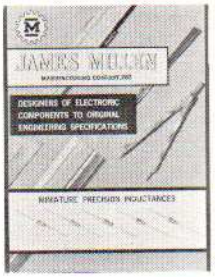
KNOBS, DIALS AND SHAFT HARDWARE

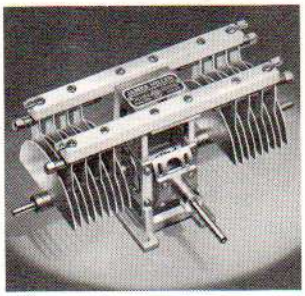
The illustrations at the left is indicative of the Millen "family" of knobs and dials using compatible styling for its various sizes. The complete Millen catalog features miniature and standard size knobs and dials, illuminated panel dials, dial index, and dial locks. Also listed are other Millen components including miniature and standard size bearings, shaft locks, flexible couplings and drives. A 16-page illustrated catalog is available for complete information.



TRANSMITTING COILS AND R. F. CHOKES

James Millen Mfg. Co., Inc. supplies high quality transmitting coils and a wide selection of R.F. chokes for amateur radio applications. The more popular styles now in production are illustrated at the left. These are typical of the R.F. chokes available. The Millen R.F. Choke Catalog illustrates and provides specifications for Millen chokes. Write for catalog.





TRANSMITTING CAPACITORS

The Millen 16-page Capacitor Catalog describes and illustrates in detail transmitting capacitors. Many styles are made by **James Millen Mfg. Co., Inc.** and the Capacitor Catalog provides a comprehensive listing and shows the many variations available to the radio amateur. Millen capacitors are designed for easy and practical application. Write for catalog.

JAMES MILLEN MFG. CO., INC.
MAIN OFFICE AND FACTORY
MALDEN, MASSACHUSETTS, U.S.A.

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