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ideas for engineers

1986 Directory Issue

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- 75Ω adaptor
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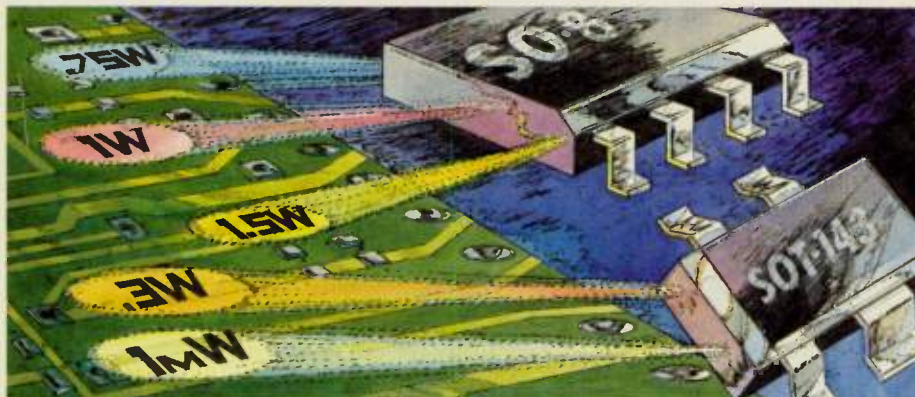
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Motorola RF Design News



Take your choice of surface-mount power.

GHz gain, miniscule drain in SOT-143.

Operating at less than 1 mA I_C with a V_{CC} of only 1 V, the MRF9331 offers 13 dB typical gain at 1 GHz and 2 dB NF at 500 MHz. Use of a single emitter finger of a 1.25 micron die design achieves state-of-the-RF-art performance with high, 6 GHz f_T .

Applications are pagers, portable radios, hearing aids, remote controlled door openers and any equipment operating on batteries you want to last. Wide dynamic range is possible with 100 μA to 2 mA I_C .

And SOT-143s provide dual emitters for best performance in common emitter configurations. Price: just \$1.50, 1K-up.



600 W, MRF430 bipolar unit not for the timid.

At 600 W P_{out} , the MRF430 is the most powerful bipolar RF transistor of its kind. It's for those who want to have it all in one potent package without water-cooling for linear amplifiers from 2 to 30 MHz, base station equipment, nuclear magnetic resonance, sputtering equipment or in 1 KW SSB amplifiers.

You replace up to eight lower-powered units plus associated parts and circuitry. Low, 0.2° C/W thermal resistance keeps die temperature cooler for a given P_D , improving reliability and allowing direct, heat sink mounting. It's basically four MRF429s in a single package with all the ruggedness and low IMD of the 429.

And 50-up is only \$315—30% less than MOSFETs.

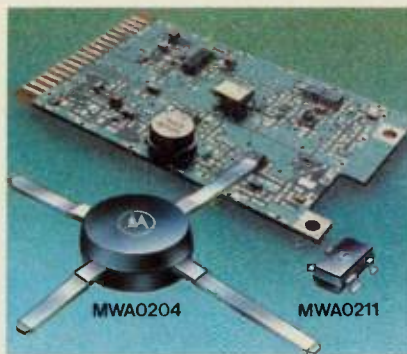
900 MHz SO-8 grabs 1 W honors.

Providing 1 W and more P_D , equal to or exceeding that of MACRO-X and SOE packaging, the MRF8372 is the SMD version of the popular, 6 GHz f_T MRF837 used in wideband, large-signal, pre-driver, 900 MHz, land-mobile stages.

No sacrifices in technology, either: 2-micron geometry, gold top metal, ion-implanted emitters and silicon nitride passivation.

Typical performance is 10 dB gain at 870 MHz, 12.5 V, in a broadband circuit delivering 3/4 W RF power with 60% efficiency. It's also characterized at 7.5 V and at 512 MHz.

Little price, too: \$1.65, 1K-up.



Monolithic RF amplifier available two ways.

Our first monolithic wideband RF amplifier—the MWA0204—is designed for industrial/commercial systems up to 3GHz and offers 12 dB typical gain at 500 MHz.

It's fully cascadable, provides 50 Ω input and output impedances and is available in low-cost, plastic packages. The basic MWA0204 is in a MACRO-X™ strip-line package while the MWA0211 is in the surface-mountable SOT-143.

Data sheet parameters cover gain, gain compression, noise figure, input/output VSWR and S-parameters to 2 GHz.

Superb 8 GHz performer even more so in SOT-143.

None finer and now in SOT-143. It's the popular MRF571 and it's now MRF5711 in 4-leaded SMD for reduced common-element inductance and higher gain.

Leading-edge die technology, identical to its MACRO-X counterparts, provides 1.7 dB NF and 12 dB gain at 1 GHz.

Available in standard and low profile, this high-performer is ideal for high-gain, low-noise, small signal amplifiers: satellite TV receivers (TVRO), wide dynamic range front end amplifiers and low-noise VCOs. Plus instrumentation applications where high-gain to high-frequencies are required, or in fast switching designs.

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☐ MWA0264 ☐ MRF5711

268RFDD090086

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rf Directory

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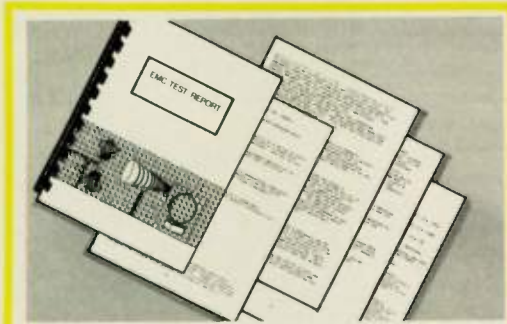
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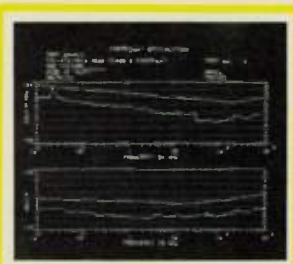
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How to Use This Directory



This is the third Directory issue produced by *RF Design* magazine and, we think, the most helpful one yet for RF engineers. It represents another step in our effort to produce the most complete listing available of products, services and companies of interest to the RF design engineer. The products included in this Directory have been carefully screened to include only those that perform at least some of their functions below 2 GHz. All the companies listed provide some products and services for the RF designer.

The Directory is divided into nine sections: Components, Modules and Hybrids, System Blocks, Transmission Components, CAD/CAE Software and Systems, Materials and Hardware, Test Equipment, Services, and EMC Products. Headings between the lines at the top of the page identify the sections, as illustrated in the example to the right.

Subheadings, in large type, divide each section into types of products within that category. Within the Components section, for example, are capacitors, crystals, diodes, inductors, integrated circuits, resistors, transformers and vacuum tubes. Part of the capacitor division is shown in the example.

Each product type is further divided into varieties, when such a division would be helpful and save you time. Within the capacitor type, as shown in the example, you can quickly find those companies that make chip capacitors, or those that make other varieties of fixed capacitors, or those that make variable capacitors. Vacuum capacitors is another variety included in the Directory, but not shown in the example at the right.

To allow for quick reference only the company name is shown under each product variety or type. An alphabetical listing of all companies is in the back of the Directory on pages identified with black margins. As the example shows, each company name, address, telephone number and contact person is given. This listing can also be used to find out what type of products a company makes since the categories under which they appear in the Directory are given at the bottom of each company listing.

This is the only product Directory available that includes only RF products and services. We think you will soon discover that it is the best source to turn to for RF design information. We welcome your comments and suggestions for further improvements.

Components

CAPACITORS

CHIP

ALPHA INDUSTRIES, INC.
AMERICAN PRECISION INDUSTRIES, DELCAP DIVISION
AMERICAN TECHNICAL CERAMICS CORP.
ARCOLECTRIC CORPORATION
AVX CORP.
CAPAR COMPONENTS
CENTRE ENGINEERING, INC.
CORNING ELECTRONICS
DIELECTRIC LABORATORIES, INC.
EATON CORP., COMPONENT & SEMICONDUCTOR
PLANT, MICROWAVE PROD. DIV.
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EMC TECHNOLOGY, INC.
ENI POWER SYSTEMS, INC.
FREQUENCY SOURCES, INC.
JOHANSON DIELECTRICS, INC.
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OTHER FIXED

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AVX CORP.
CAPAR COMPONENTS
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New!

Symmetrical Shielding Strips (S³) provide bi-directional engagement at severe shear angles!

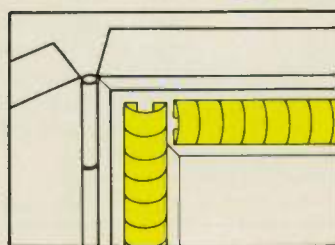
These new symmetrical slotted shielding strips of beryllium copper permit continuous spring contact throughout their length, providing the perfect answer for a variety of shielding requirements.

Three models are available: basic, rivet-mount and double-faced adhesive-mount designs. The basic design consists of low-compression, adhesive-mounted strips. A generous radius profile provides for the greatest incident engagement angle with the lowest force. As with all Sticky Fingers[®] shielding strips, the self-adhesive tape makes mounting easy and secure.

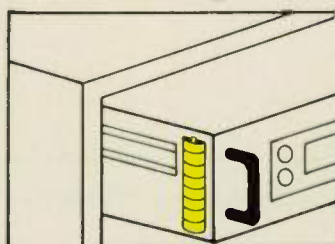
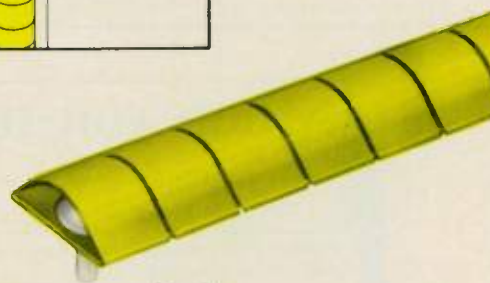
The rivet-mount design incorporates the addition of an integral track, pierced for mounting with nylon push rivets. This configuration allows bi-directional engagement, and is specially designed for slide applications, PC board connections, etc.

The third design also incorporates an integral track-mount design, but employs a double-faced adhesive tape instead of push rivets. This provides for fast, easy field replacement in military applications, especially where high frequencies do not permit the use of mounting holes.

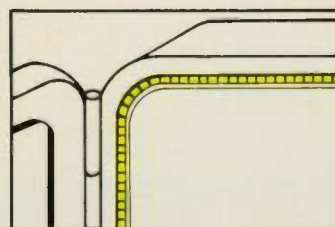
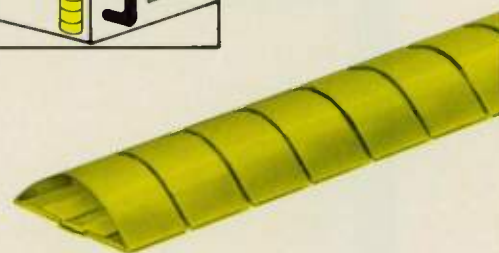
For complete information, including exact specifications, dimensional drawings, etc., on these and other Instrument Specialties shielding strips, use this publication's Reader Service Card. Or write to us directly at Dept. RFDD-30



Adhesive-mounted strips for typical electronic enclosures.



Strips with integral mounting track* and nylon push rivets, for sliding drawer applications.



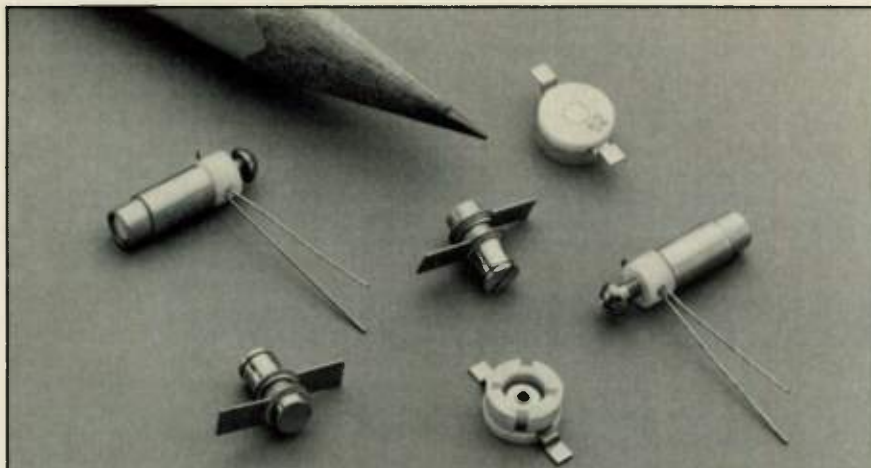
Strips with integral mounting track* and self-adhesive strip for fast field replacement.

*patent pending



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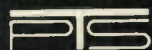
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10 dB ATTEN

10 dB

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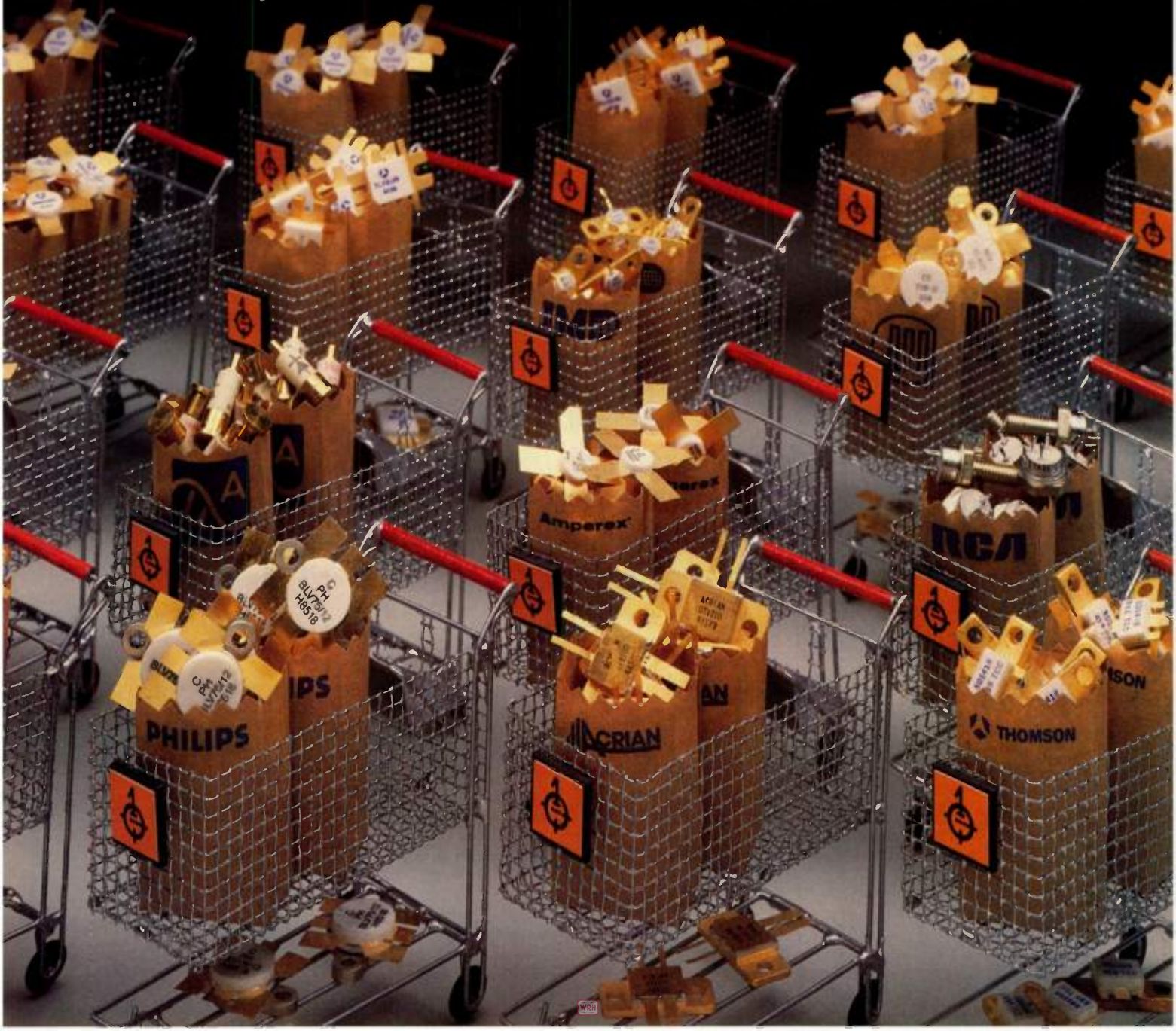
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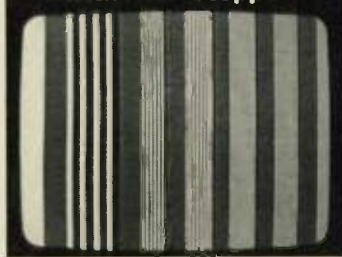


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- Operates from 115/230V receptacle



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- Up to 5 watts saturated



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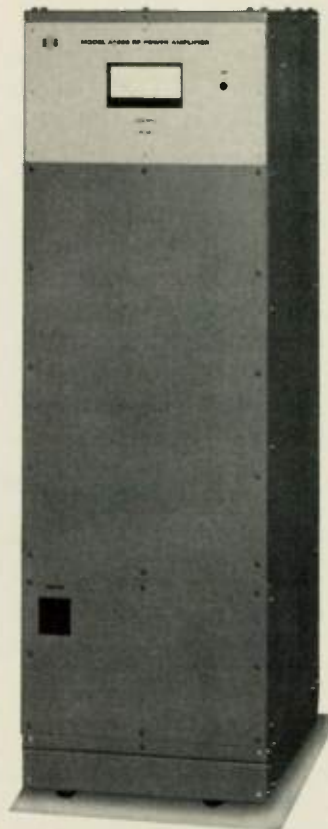
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- 100 watts linear power
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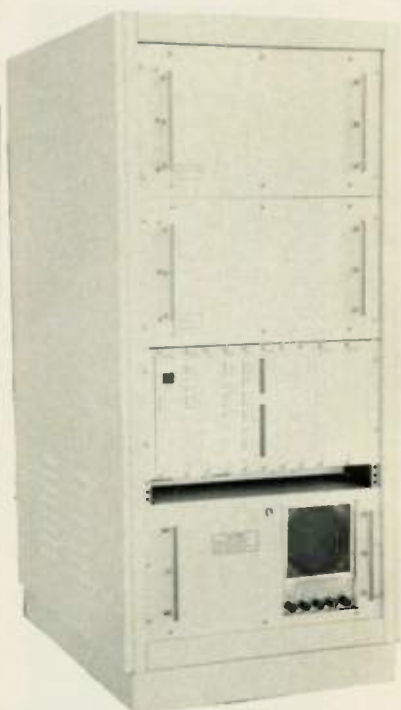


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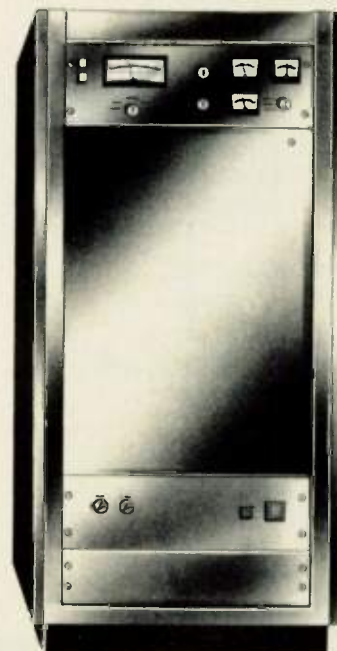
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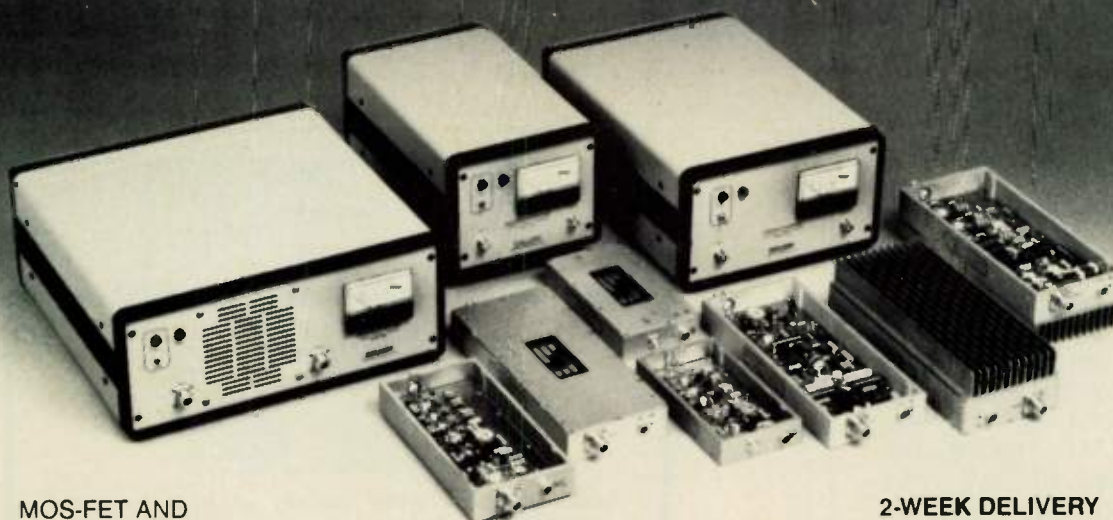
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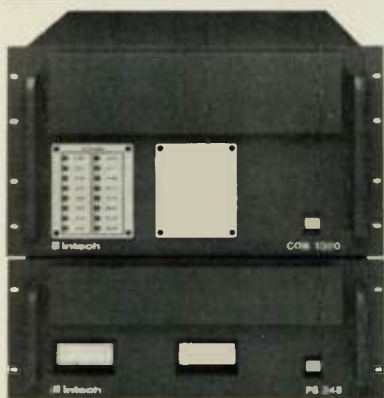
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PF829	406-512	16.5	4.5	+38
PF833	800-920	26.5	2.8	+34
PF845	800-915	18.0	2.0	+35

In addition to RF Amplifiers, Janel manufactures a wide range of standard Power Dividers and other rf components. Custom designs can be provided for unusual applications. For detailed information, call or write Janel Laboratories, Inc., 33890 Eastgate Circle, Corvallis, OR 97333. Telephone (503) 757-1134.

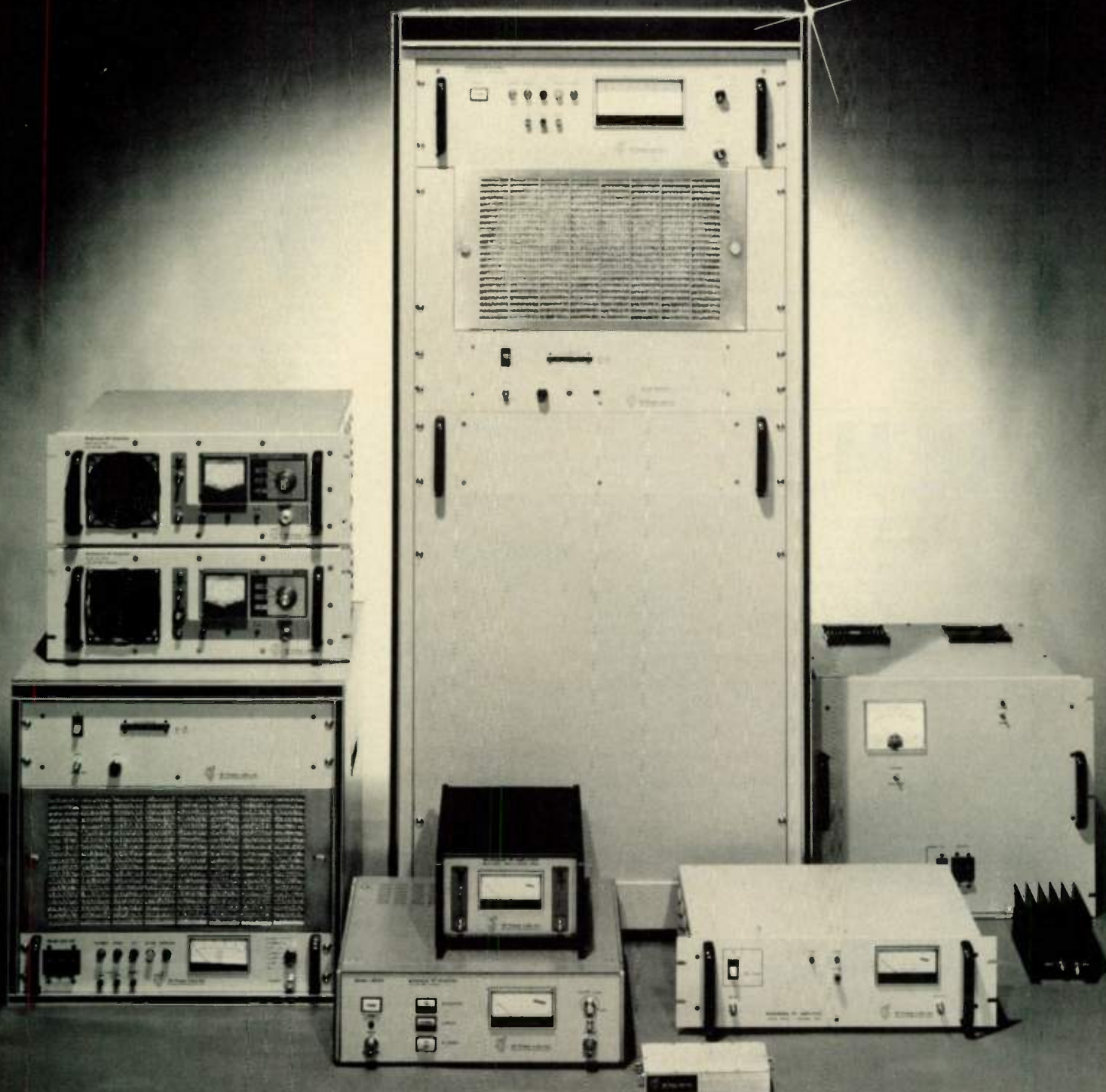


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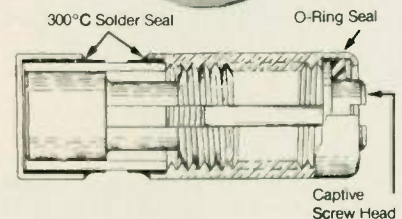
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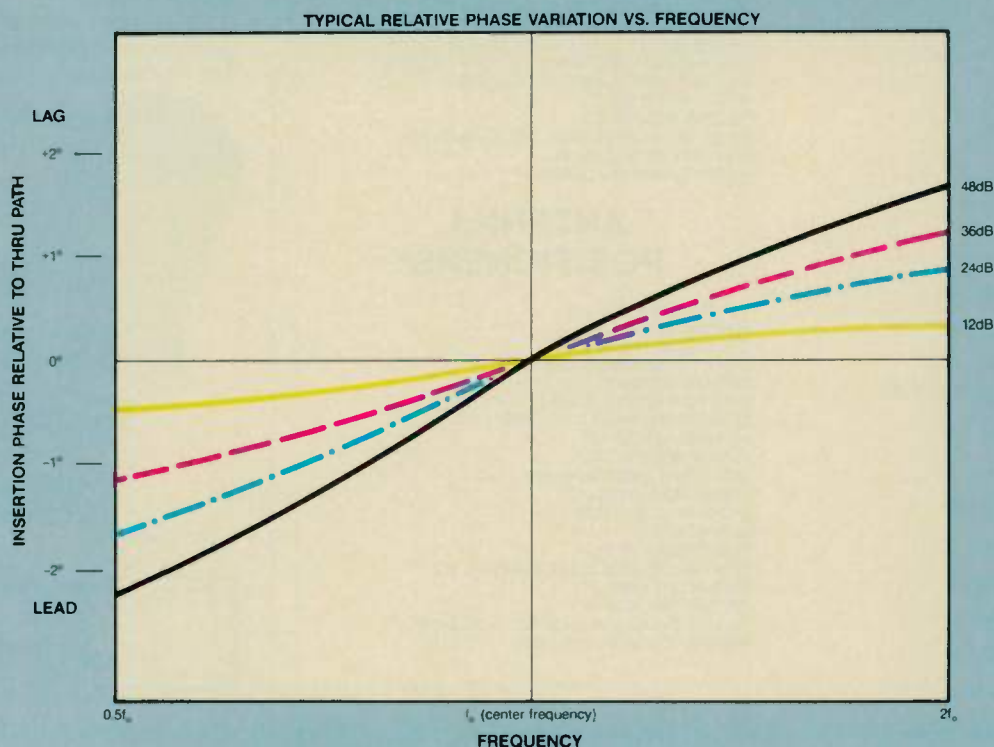
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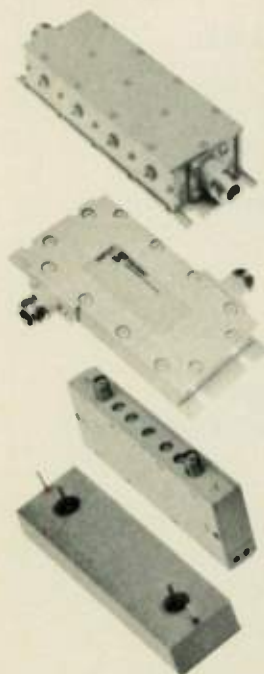
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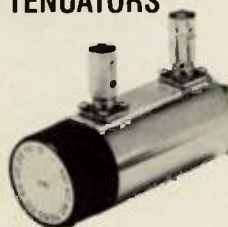
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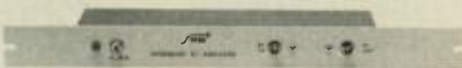
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Model	Freq MHz	Gain dB	Flatness (dB)		Noise Figure	Input VSWR	Output Capability	Hum Modulation	Size
			1-500 MHz	5-300 MHz					
A62/20	1-500	20	±.15	±.1	7 dB max. 5 dB typical	1.5:1 max. 1.1:1 typical	.7V min output for 1 dB gain Compression (saturation 1 V)	.5% max.	EIA Panel 1 3/4" x 18" 3 1/4" chassis depth
A52/30		30	±.20	±.15					
A52/40		40	±.30	±.20					
A52/50		50	±.45	±.25					
A72/60		60	±.60	±.30					
A62/20/6	1-600	20	±.15	±.1					
A52/30/6		30	±.22	±.15					
A52/40/6		40	±.30	±.20					
A52/50/6		50	±.45	±.25					
A72/60/6	1-900	60	±.60	±.30					
A52/1/30		30		±.50					

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**See
Matrix Systems
Ad on
Coaxial Switching**

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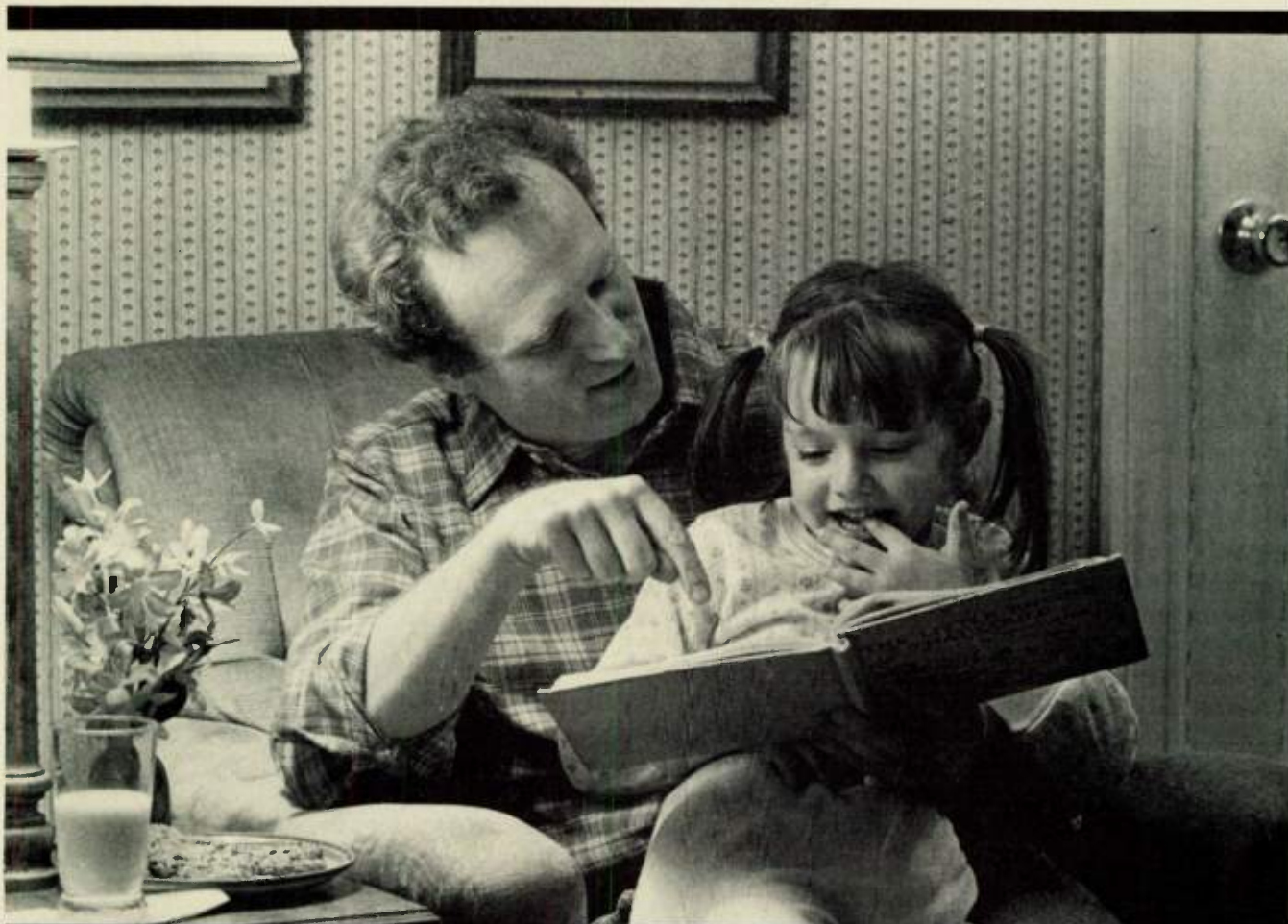
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See Matrix Systems Ad on Coaxial Switching

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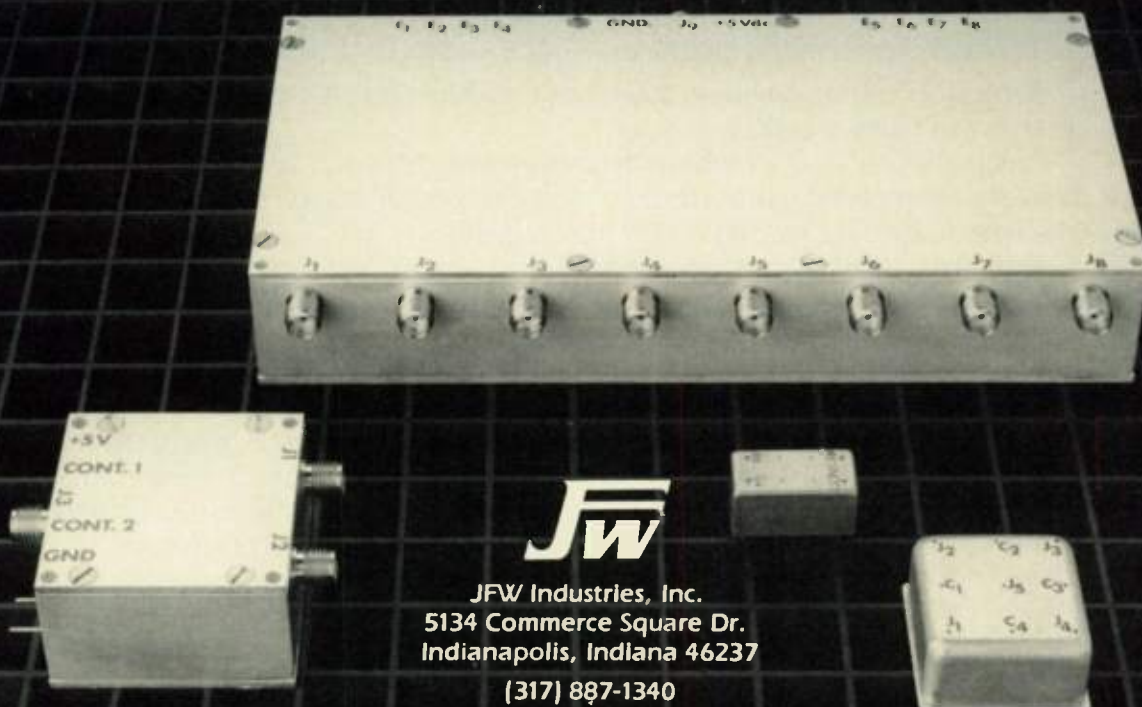
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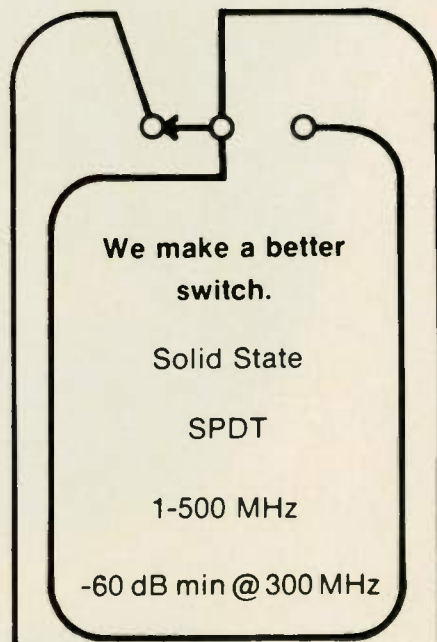


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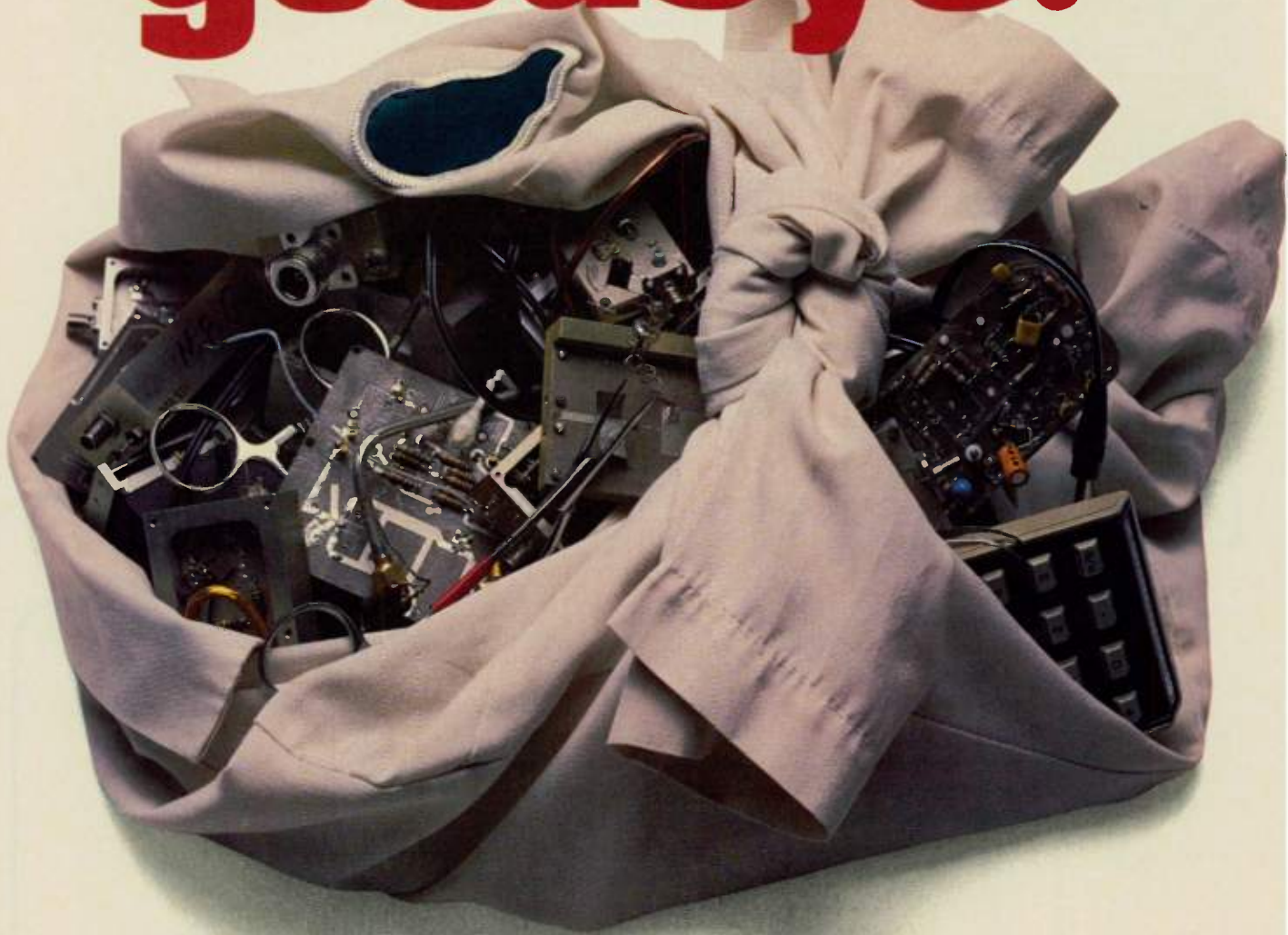
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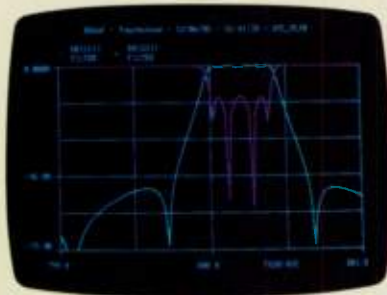
A

A. Touchstone analysis of an active triplexer circuit with sampled output

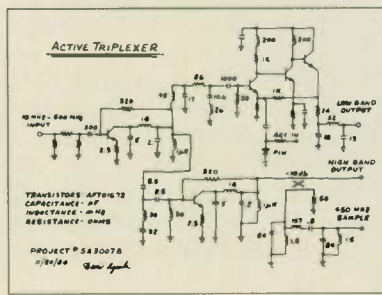
B. Insertion loss and return loss of crystal filter analyzed over its narrow pass band.

C. Schematic diagram of the active triplexer analyzed above

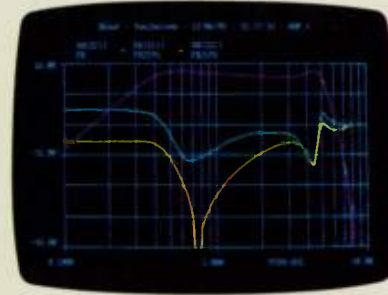
D. A log axis can be used for displaying very broad frequency ranges. This feed back amplifier operates over nearly a decade bandwidth.



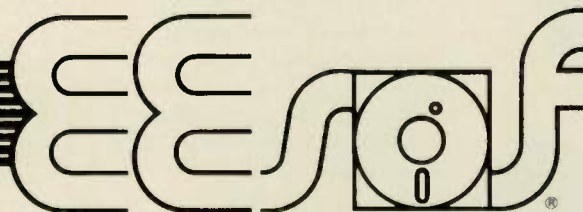
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C



D

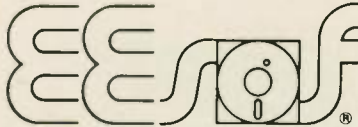


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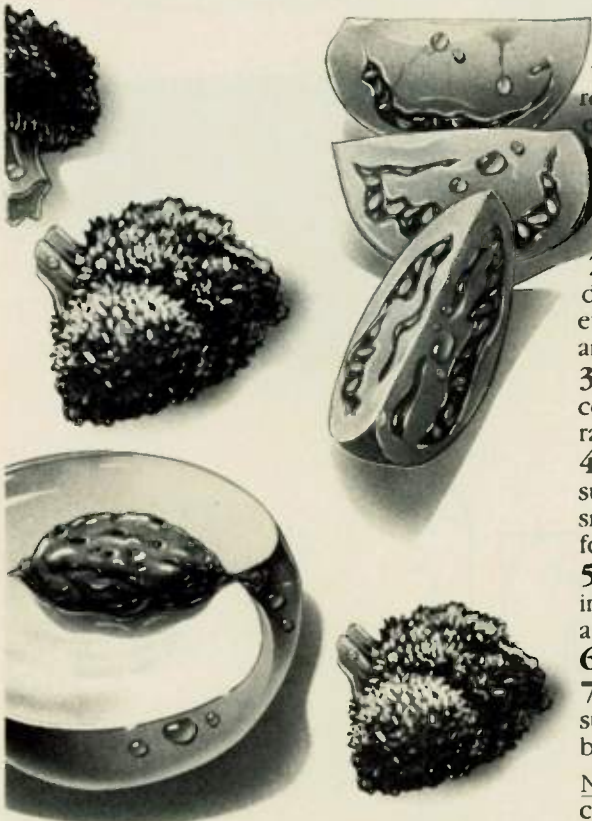
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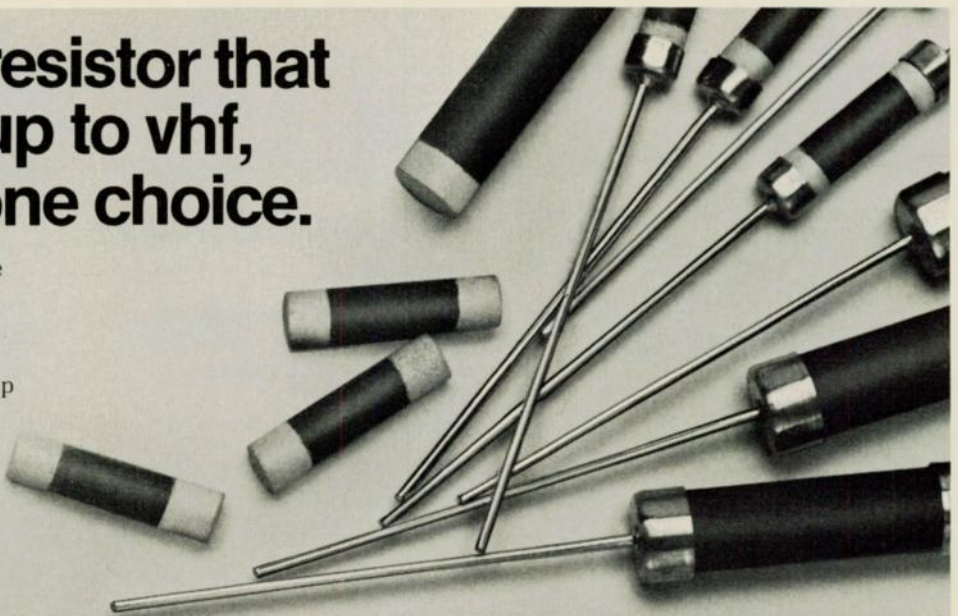
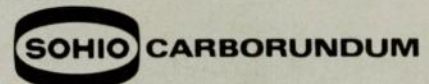
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DIRECTIONAL COUPLERS

Model	Freq Range MHz	Coupling Level dB	Coupler Type	In Line Power	Minimum Directivity dB		In Line Loss (dB)	Flatness of Coupled Port (dB)	VSWR
					1-500 MHz	5-300 MHz			
A73-20	1-500	20	single	5W cw (10W cw 5-300 MHz)	20	30	.4 max .2 typical	±.1 5-300 MHz ±.25 1-500 MHz	1.05:1 5-500 MHz 1.5:1 1-500 MHz
A73-20CA					30	40			
A73-20GB					40	45			
A73-20P	1-100		single	50W cw	35 dB min 40 dB min typical		.15	±.1	1.1:1 max 1.04:1 typical
A73D-20P			dual				.3		
A73-20PX			single		45 dB min		.15		
A73D-20PX			dual				.3		
A73-20PA	10-200		single	(75 ohm limited to 10W cw)	35 dB min 40 dB min typical		.15		
A73D-20PA			dual				.3		
A73-20PAX			single		45 dB min		.15		
A73D-20PAX			dual				.3		
A73-30P2	1-100	30	single	200W cw	30 dB		.05	±.15 2.10	1.05:1 max
A73-30PX2			single	50 ohm	40 dB		.05		
A73M	1-500		NA	50W cw	none		.1	±.25	1.1:1

Other Directional Couplers available for 50 KHz - 50 MHz range. Also alternate coupling levels available. Consult Factory.

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Amplitude	-127dBm to +13dBm	-127dBm to +13dBm
Accuracy	± 1.0 dB (520MHz)	± 1.0 dB
Spurious	< -90 dBc (520MHz)	< -60 dBc
Modulation	AM, FM, ϕ M	AM, FM

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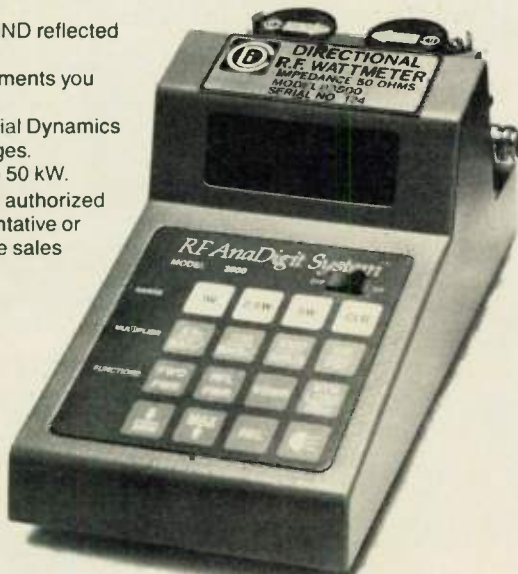
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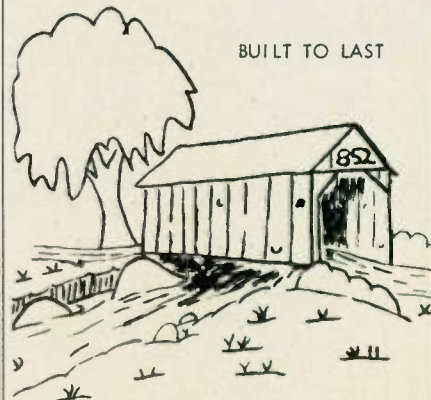
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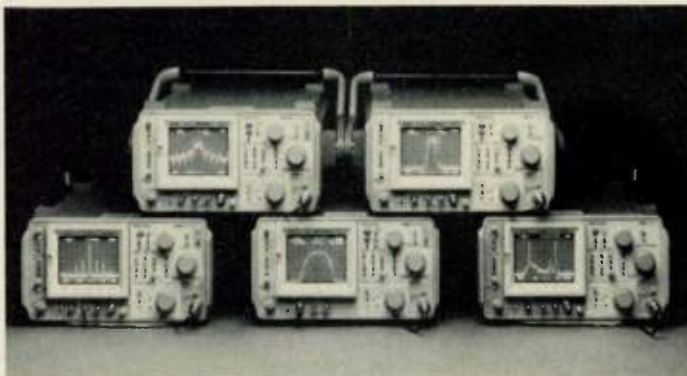
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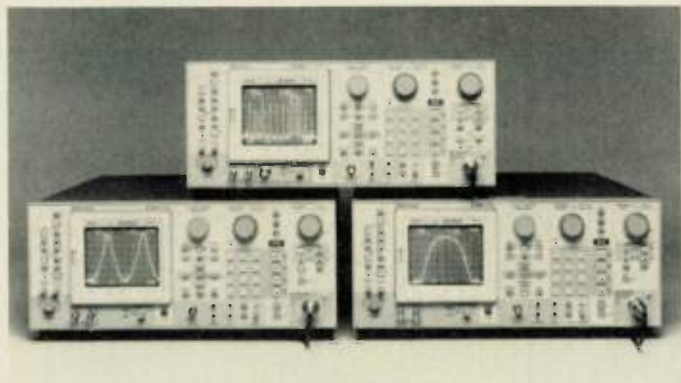
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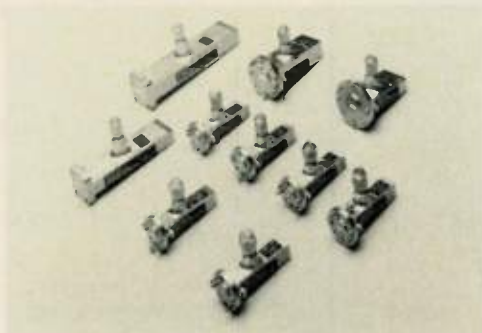
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2754P	50 kHz to 21 GHz	1 kHz	-115 dBm	+30 dBm to -115 dBm	Full	TR 503	
2755	50 kHz to 325 GHz	100 Hz	-125 dBm	+30 dBm to -125 dBm	Direct Plot	TR 503	$\pm[(20\% \text{ Span/Div or Resolution BW}) + (\text{Center or Marker Frequency}) \times 10^{-5}] \text{ Hz}$
2755P	50 kHz to 325 GHz	100 Hz	-125 dBm	+30 dBm to -125 dBm	Full	TR 503	
492A	50 kHz to 325 GHz	100 Hz	-125 dBm	+30 dBm to -125 dBm	Direct Plot	TR 503	$\pm[(20\% \text{ Span/Div or Resolution BW}) + (\text{Center or Marker Frequency}) \times 10^{-5}] \text{ Hz}$
492AP	50 kHz to 325 GHz	100 Hz	-125 dBm	+30 dBm to -125 dBm	Full	TR 503	
494	10 kHz to 325 GHz	30 Hz	-121 dBm	+30 dBm to -121 dBm		TR 503	$\pm[(2\% \text{ Span or Res BW}) + (\text{CF} \times \text{Ref Error}) + (2N + 25 \text{ Hz})]$
494P	10 kHz to 325 GHz	30 Hz	-121 dBm	+30 dBm to -121 dBm	Full	TR 503	
495	100 Hz to 1.8 GHz	30 Hz	-130 dBm	+30 dBm to -130 dBm	Direct Plot	TR 503	$\pm[(2\% \text{ Span or Res BW}) + (\text{F} \times \text{Ref Error}) + 15 \text{ Hz}]$
495P	100 Hz to 1.8 GHz	30 Hz	-130 dBm	+30 dBm to -130 dBm	Full	TR 503	Where: F = Center or Marker Frequency Ref Error = 10^{-5} Standard 10^{-9} Option 05
496	1 kHz to 1.8 GHz	30 Hz	-126 dBm	+30 dBm to -126 dBm		TR 503 (to 1.8 GHz)	$\pm(5 \text{ MHz} + 2\% \text{ Span})$
496P	1 kHz to 1.8 GHz	30 Hz	-126 dBm	+30 dBm to -126 dBm	Full	TR 503	$\pm(5 \text{ MHz} + 2\% \text{ Span})$
7L5	20 Hz to 5 MHz	10 Hz	-148 dBV	+8 dBV to -148 dBV	Semiautomatic with 7854	Option 25	$\pm(5 \text{ Hz} + 2 \times 10^{-6} \text{ Dot Freq})$
7L12	100 kHz to 1.8 GHz	300 Hz	-115 dBm	+30 dBm to -115 dBm	Semiautomatic with 7854	TR 502	$\pm(8 \text{ MHz} + 1\% \text{ of Dial})$
7L12 Option 39	100 kHz to 2.5 GHz	300 Hz	-115 dBm	+30 dBm to -115 dBm	Semiautomatic with 7854	TR 502 (to 1.8 GHz)	$\pm(8 \text{ MHz} + 1\% \text{ of Dial})$
7L14	10 kHz to 1.8 GHz	30 Hz	-130 dBm	+30 dBm to -130 dBm	Semiautomatic with 7854	TR 502	$\pm(5 \text{ MHz} + 2\% \text{ Span})$
7L14 Option 39	1 kHz to 2.5 GHz	30 Hz	-130 dBm	+30 dBm to -130 dBm	Semiautomatic with 7854	TR 502 (to 1.8 GHz)	$\pm(5 \text{ MHz} + 2\% \text{ Span})$

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B

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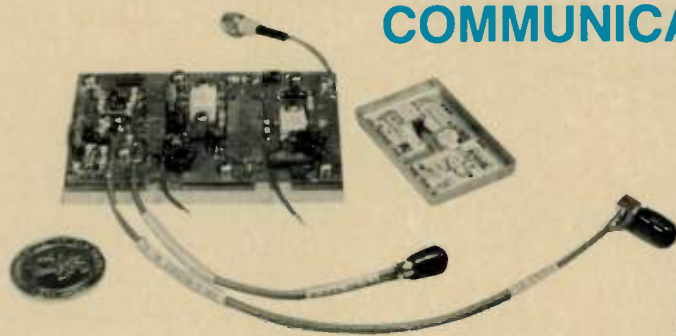
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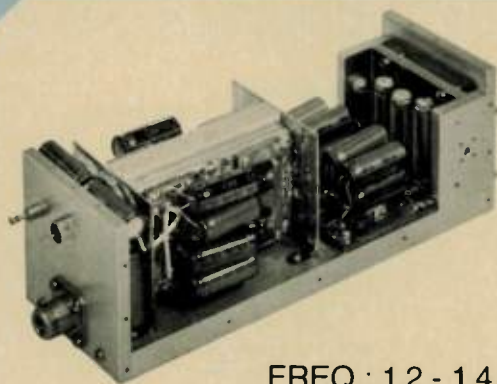
COMMUNICATIONS



FREQ.: 420 - 450 MHz
PWR: 10W & 160W pulsed.



FREQ.: 250 - 350 MHz.
PWR: 13W.



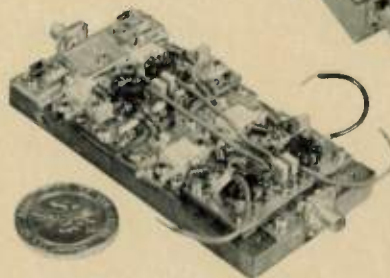
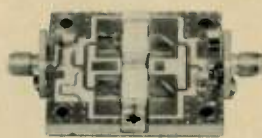
FREQ.:
420 - 450 MHz
PWR: 1200W
pulsed.



FREQ.: "L" band.
PWR: 1000W
pulsed.

RADAR

FREQ.: 1.2 - 1.4 GHz
PWR: 300W pulsed.



FREQ.:
420 - 450 MHz.
PWR: 700W.



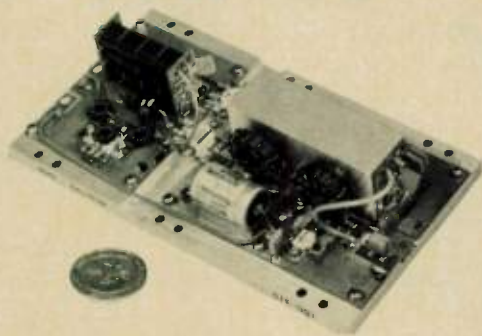
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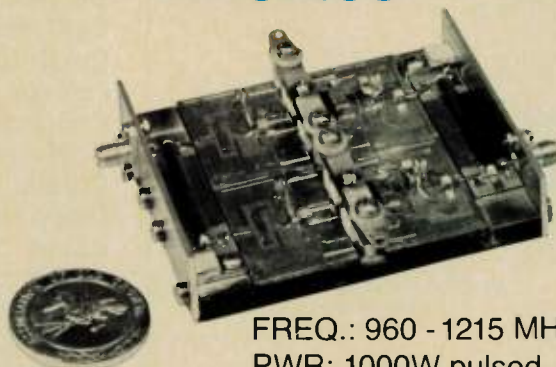
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ECM • EW



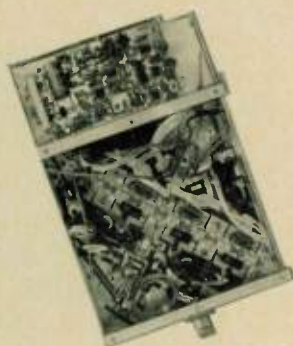
FREQ.: 1 - 150 MHz. PWR: 150W.

AVIONICS



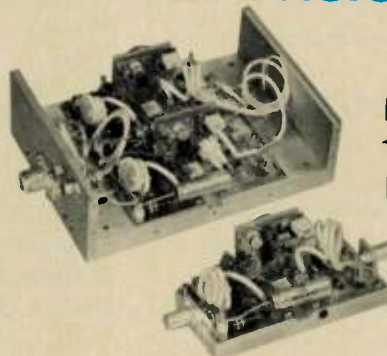
FREQ.: 960 - 1215 MHz.
PWR: 1000W pulsed.

BROADCAST



FREQ.:
88 - 108 MHz.
PWR:
700W.

TELEVISION



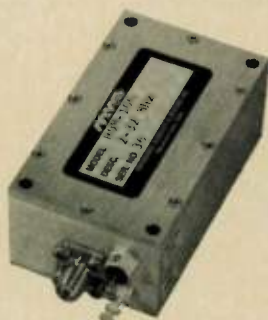
FREQ.:
170 - 230 MHz.
PWR:
100 - 200W.

RECEIVER AMPLIFIER MODULES

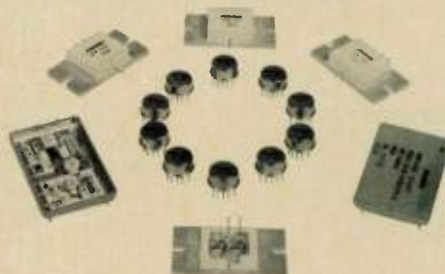
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DYNAMIC
RANGE.

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FREQ.: 2-32MHz FREQ.: 20-80MHz



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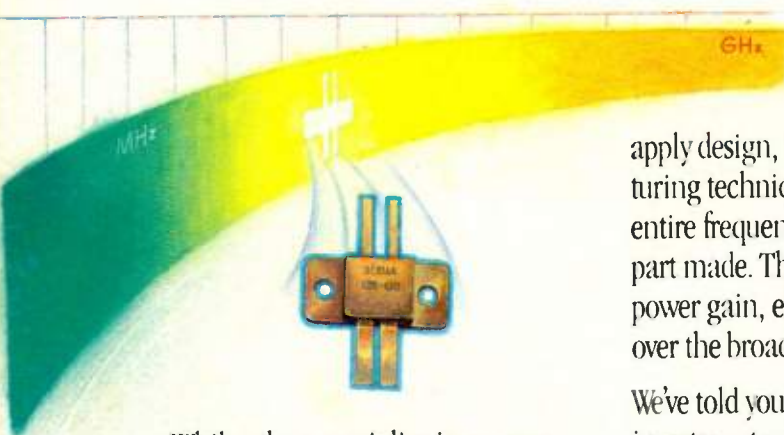
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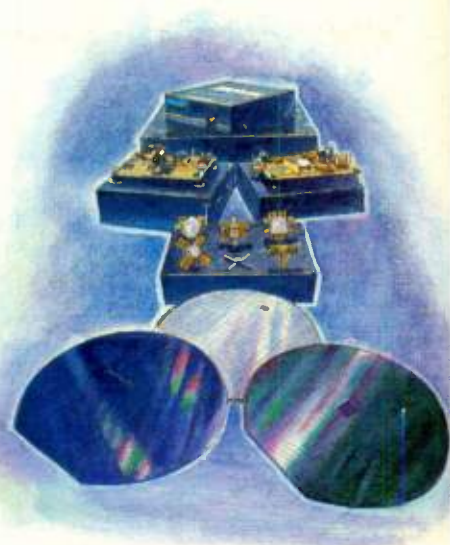
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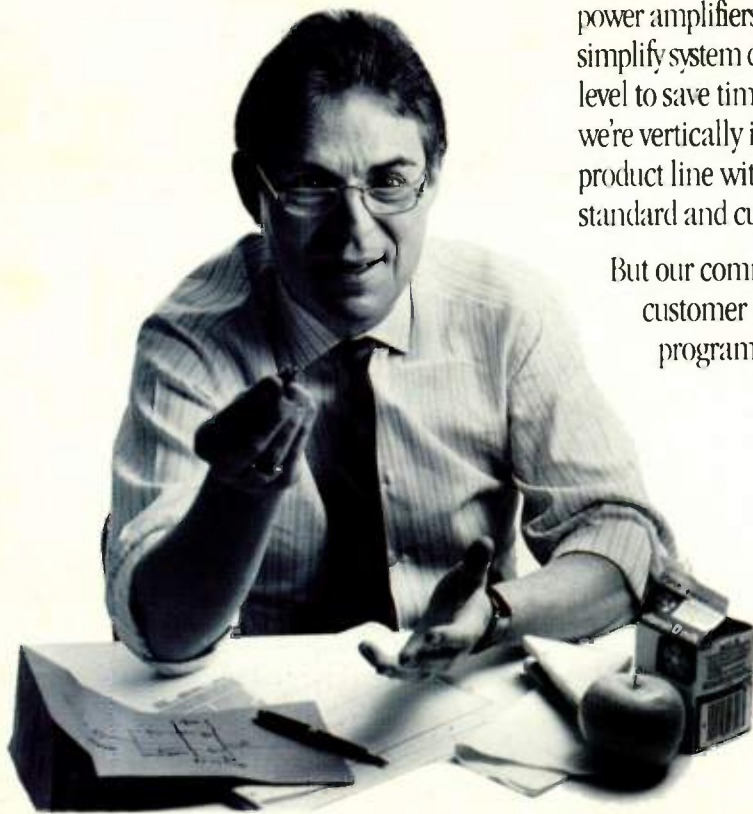
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