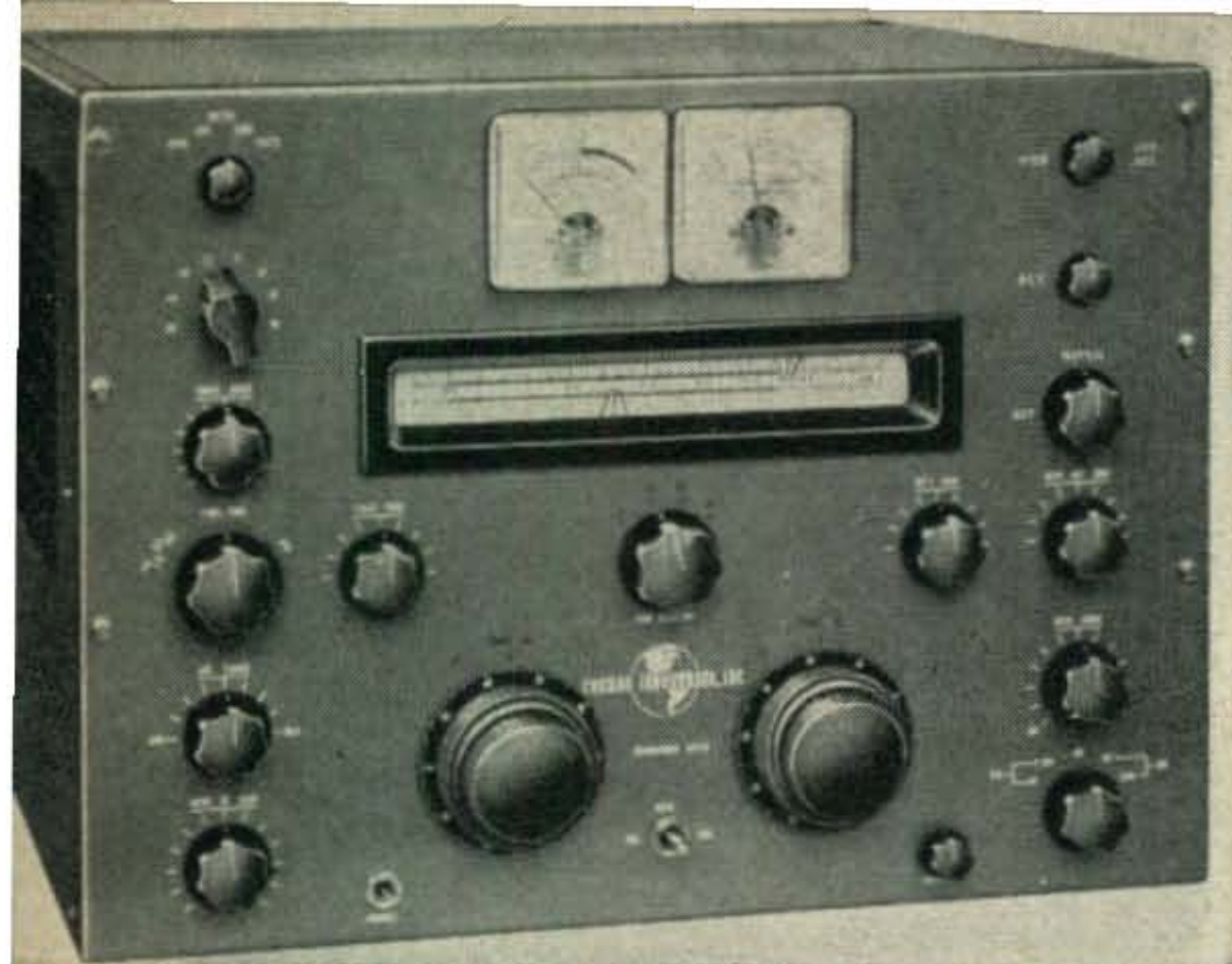




CQ Reviews the:

Cosmophone "1000"

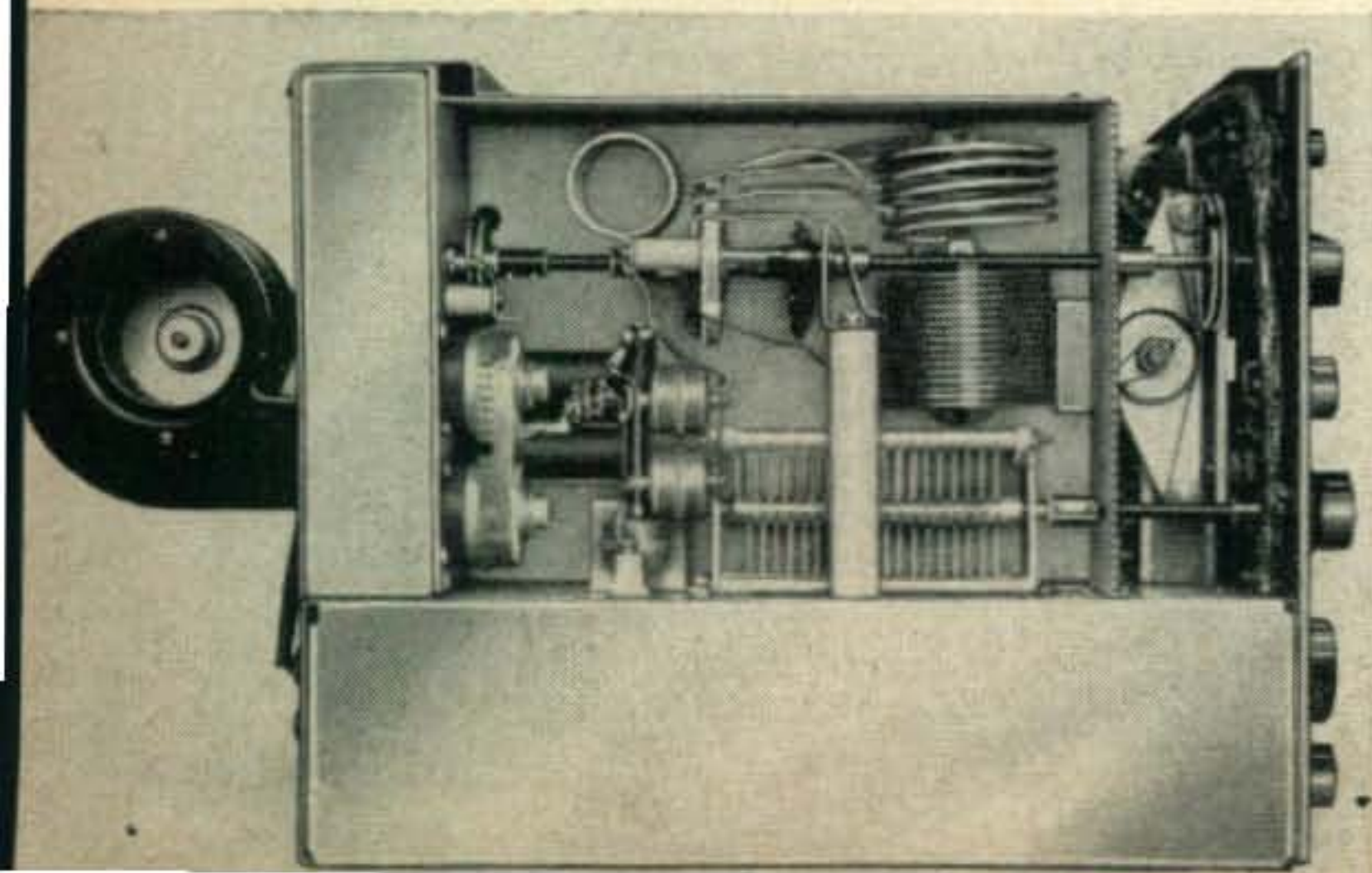
When we first reviewed the Cosmophone "35", we were impressed by the size and versatility of this little 35 watt bilateral ssb transceiver. The most praiseworthy feature of the unit was that it contained two independently controlled VFO's functioning as two separate receivers and transmitters or two transceivers.

I had the good fortune to spend a few hours with the boys up at Cosmos Industries last week. They escorted me into the lab and confronted me with, what to all appearances, was a Cosmophone "35". It contained all the usual features with a major modification. The single 6146 power amplifier had been replaced with a pair of Eimac 4CX-300A's, providing a plate input of up to 1.2 kw instead of the usual 35 watts. The only apparent change in the appearance of the unit was the addition of a second meter to the front panel.

Receiver Section

To begin with, let's review some facts about the receiver section of the "1000". Actually, there have been only minor changes in the unit as far as its reception capabilities. The "Q" Multiplier found in the original "35" has been replaced with an effective "T"-Notch Slot Filter. This gives the operator the ability to sweep across the 3.1 kc bandpass of the *if* and notch out any interfering signals that may be present. The notch depth is quite deep; being in excess of 40 db. I was able to tune in a 40 db over 9 AM carrier, apply the notch, and watch the "S"-Meter drop from plus 40 to about S-1. Then by merely retuning slightly, I was able to return the signal to its original strength as read on the meter. This demonstrated, to my way

Side view of blower cooled final cage.



of thinking, the ability of the "T"-Notch to reduce even the strongest undesirable signals present in the *if* bandpass.

Sensitivity-wise, the "1000" is right in there with the best of them, showing 1 microvolt for a 6 db S/N ratio. The mechanical filter employed in both the ssb generating section and the receiver *if*, provides for a bandwidth of 3.1 kc, with extremely sharp skirts.

I had the opportunity to watch a stability test on a production unit. By coupling the output of the *vfo*'s to a Berkeley Counter, I was shown that the drift of the unit was less than 100 cycles from a cold start—this at ambient room temperature. The solid construction and packaging of the unit makes for a high degree of mechanical stability as well.

The tuning system has a reduction knob with two speed output. The operator can select either 20:1 for rapid tuning across a large range or 100:1 for smooth, vernier bandspread tuning. Skirts are included on each knob, which enable one to determine frequency to 1 kc. These are resettable. By using the built in 100 kc calibrator, holding the knob, and setting the skirt to coincide with the calibrator, a high degree of readability can be obtained.

By using a carefully designed balanced detector for ssb reception, The Cosmophone "1000" delivers a high quality received signal even on the strongest 9 plus powerhouses. The operator can use the unit with the *rf* gain at maximum with good results, as the *avc* system is such that there is little distortion and no pumping.

Let's not forget one other major point. The *bfo* in the "1000" is crystal controlled, with the crystals matched to the mechanical filter to provide just the right reception of ssb signals. This adds stability to the receiver as well.

Transmitter Section

The sideband generating section of the Cosmophone has seen little modification. The block diagram shows the tube lineup and basic scheme behind the transmitter. The same mechanical filter is used to generate sideband. By carefully selecting the crystals for the carrier oscillator, Cosmos has been able to achieve some outstand-

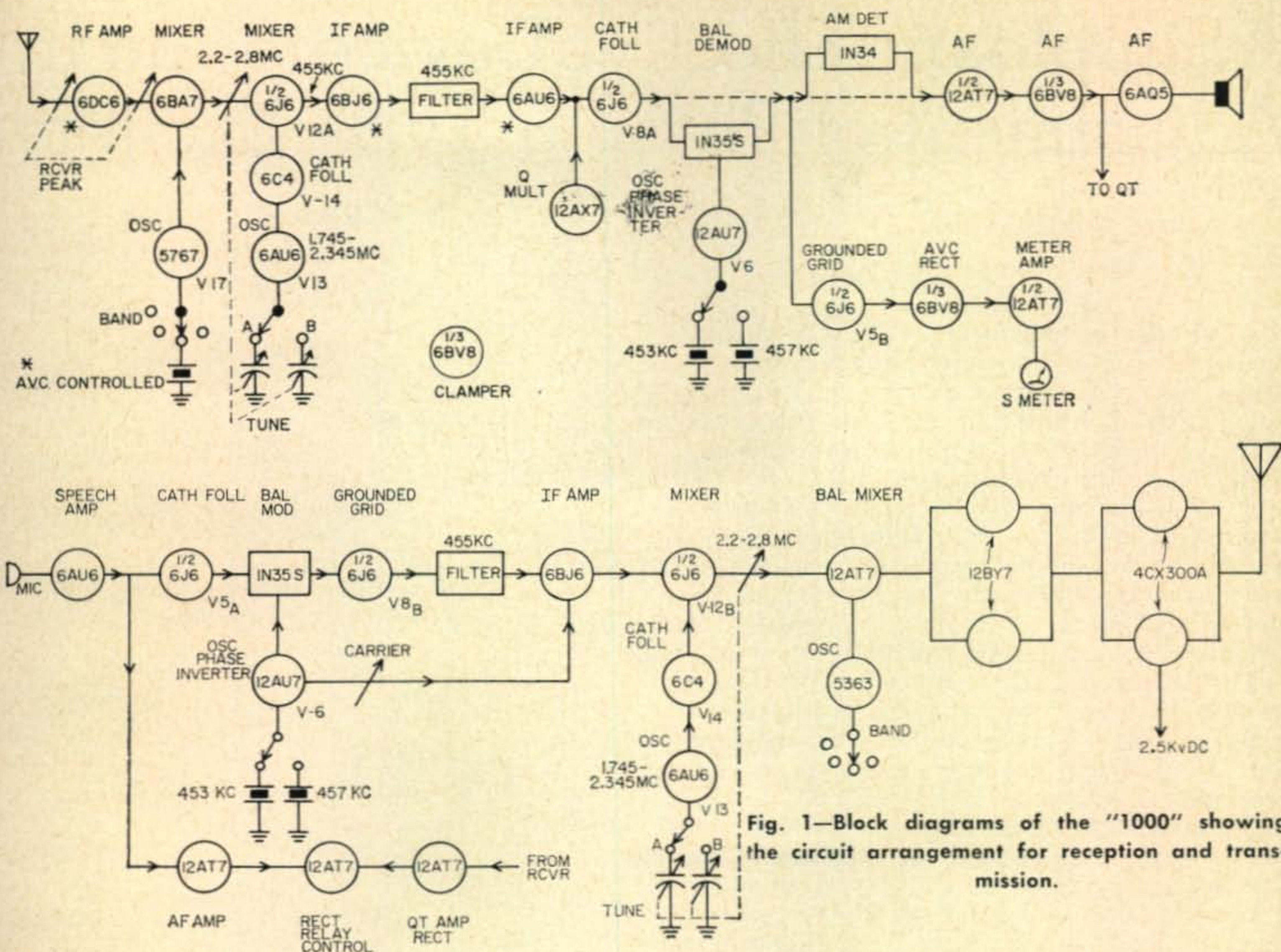


Fig. 1—Block diagrams of the "1000" showing the circuit arrangement for reception and transmission.

ing results as far as quality of transmitted signal is concerned.

Unwanted second order distortion products are better than 32 *db* down. Unwanted sideband suppression is 42 *db* down or better. Since the same *vfo*'s control both receiver and transmitter, the drift factor is the same for the transmitter as receiver.

Final Amplifier

As already stated, the 6146 in the "35" has been replaced by a pair of Eimac 4CX-300A's in the "1000". These tubes are extremely small, rugged, ceramic versions of the 4X-250B. Using two of these in linear amplifier service gives one a total plate dissipation of 600 watts with a maximum plate power input on the order of 1.2 *kw* in the space normally required for a pair of 6146's. The boys at Cosmos' Lab demonstrated an output of 725 watts from the amplifier in the new "1000"; This with a plate potential of about 2500 volts under a full 1.2 *kw* load, and a plate current of around 420 *ma*. Mind you, this measurement was taken with carrier injected, and is true *dc* input; not peak envelope power.

The Plate network in the new Cosmophone "1000" is a conventional Pi-Network with an average "Q" of 10 on all bands. A 250 mmf plate tuning capacitor, silver plated coils, extremely heavy duty ceramic bandswitch, and a

1500 mmf loading capacitor make a compact LC section with an output impedance between 45 and 80 ohms; this is, of course, adequate to effect a proper match to either the 52 or 72 ohm coaxial feed systems currently popular.

I haven't said very much that would describe the TVI precautions that have been taken in the design of the Cosmophone "1000". Besides the normal shielding and filtering, Cosmos has supplied a specially designed *rf* choke for the power amplifier which is series resonant at 50 *mc*. This has proven to do quite a bit in reducing channel 2 interference. The entire unit is built in a series of partitioned compartments to eliminate any possibility of *rf* feedback and resultant oscillation. Amplifier design is such that lead lengths are minimized, components properly and strategically located etc. All these factors fit together in making the new "1000" highly TVI suppressed.

The final amplifier section in the unit is a separate compartment. Cooling of the 4CX-300A tetrodes is accomplished by a blower mounted on the rear of the cabinet. The air from the blower passes through the air system sockets and out the side of the cabinet by means of a special louvre opening. No hot air can leak through to effect any frequency sensitive components in the main unit. Should the blower not be plugged into the socket provided on the rear apron, no high voltage can be applied to

[Continued on page 88]

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4095	5090	5906	6400	6850	7350	7573	7725	7890	8090	8300	8590
4110	5127	5925	6405	6873	7358	7575	7730	7891	8091	8306	8591
4135	5165	5940	6406	6875	7366	7580	7733	7890	8100	8308	8600
4165	5205	5950	6425	6900	7373	7583	7740	7906	8106	8316	8608
4175	5235	5955	6440	6906	7375	7590	7741	7908	8108	8316	8610
4190	5245	5973	6450	6925	7400	7591	7750	7910	8116	8320	8615
4215	5327	5975	6473	6940	7406	7600	7760	7916	8120	8325	8620
4270	5385	5995	6475	6950	7408	7606	7766	7920	8125	8330	8625
4255	5397	6000	6500	6973	7416	7608	7770	7925	8130	8340	8630
4280	5435	6006	6506	6975	7425	7610	7773	7930	8133	8350	8633
4295	5437	6025	6525	7000	7433	7616	7775	7933	8140	8375	8640
4300	5485	6040	6540	7006	7440	7620	7780	7940	8141	8400	8641
4330	5485	6042	6550	7025	7441	7625	7783	7941	8150	8408	8650
4340	5500	6050							8158	8425	8658
4395	5545	6073							8160	8430	8660
4397	5582	6075							8166	8440	8670
4445	5645	6100							8170	8441	8675
4490	5660	6106							8173	8450	8680
4495	5675	6125							8175	8458	8683
4535	5687	6140							8180	8460	8690
4540	5700	6142							8183	8470	8691
4580	5706	6150							8190	8475	8700
4610	5725	6173							8191	8480	8708
4620	5730	6175	6573	7040	7450	7630	7790	7950	8200	8483	8710
4635	5740	6185	6575	7050	7458	7633	7791	7958	8206	8490	8716
4680	5750	6200	6600	7073	7466	7640	7800	7960	8208	8491	8720
4695	5760	6206	6606	7075	7473	7641	7806	7966	8210	8500	8725
4710	5773	6225	6625	7100	7475	7650	7808	7970	8216	8508	8730
4735	5775	6235	6640	7106	7483	7658	7810	7973	8220	8510	8733
4780	5780	6240	6650	7125	7500	7660	7820	7975	8225	8516	8740
4785	5782	6250	6673	7140	7506	7666	7825	7980	8233	8520	8741
4815	5800	6273	6675	7150	7508	7670	7830	7983	8240	8525	
4820	5806	6273	6700	7200	7510	7673	7833	7990	8241	8530	
4840	5820	6275	6706	7206	7516	7675	7840	7991	8250	8533	
4845	5825	6300	6725	7225	7520	7680	7841	7990	8258	8540	
4852	5840	6306	6740	7240	7525	7683	7850	8025	8260	8541	
4880	5850	6315	6750	7250	7530	7690	7858	8030	8266	8550	
4900	5852	6325	6773	7273	7533	7691	7860	8033	8270	8558	
4930	5860	6335	6775	7275	7540	7700	7866	8040	8273	8560	
4950	5873	6340	6800	7300	7541	7706	7870	8041	8275	8566	
4980	5875	6350	6806	7306	7550	7708	7873	8050	8280	8570	

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For further information, check number 29 on page 126.

pleted contact with a British Isles station will score 5 points. In addition, a bonus of 50 points may be claimed for the first contact with each British Isles country—numeral prefix, i.e. G2, G3, G4, G5, G6, G8, GB, GC2, GC3, GC4, GC5, GC6, GC8, GD2, GD3, GD4, GD5, GD6, GD8, GI2, GI3, GI4, GI5, GI6, GI8, GM2, GM3, GM4, GM5, GM6, GM8, GW2, GW3, GW4, GW5, GW6 and GW8. A further 50 points will be scored for each additional ten G3 stations worked irrespective of band.

3. Final Score—Final score therefore will be total points claimed on both bands, plus bonus points on both bands, plus the special bonus.

4. Reporting—Logs must be clearly written or typed on one side of paper only. Show in this order: Date, time in GMT, station worked, serial nr. sent, nr. received, band, bonus points and contact points.

5. Declaration—Sign a declaration that you were operating within the limits of your license and that your log is correct and true.

6. Awards—Certificates will be awarded to the leading station in each country and each call area in the following countries; VE, VK, W/K, ZL, and ZS. Besides certificates there is the Whitworth Trophy for the leading station in the British Isles.

Address your logs to: The R.S.G.B., Contest Committee, New Ruskin House, Little Russell St., London, W.C.1, England. They must

[Continued on page 105]

COSMO. [from page 55]

the final amplifier tubes. The blower motor can be activated with either the application of filament or high voltage power, depending upon the hookup. The addition of the high power linear to the Cosmophone does not mean an extra bandswitch has been added. By selecting the band, all stages in both the transmitter and receiver are switched simultaneously.

ALC has also been included as a feature of the new "1000". By setting the level of the ALC to correspond with proper amplifier operation, it is difficult, if not impossible, to drive the final to the point where severe flat topping occurs. This ALC is adjustable by means of a front panel control.

Separate High Voltage Supply

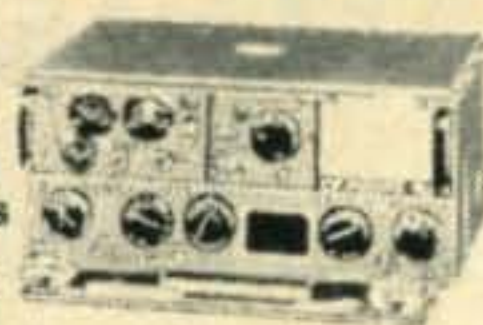
Aside from the usual PS-35 power supply, there is a compact high voltage unit. Both these can be placed under or behind the operating position, well out of sight, and full control is available at the front panel of the Cosmophone. This supply is conservatively rated at 2800 VDC at 450 ma, more than enough power to drive the final to maximum ratings, and still retain a large safety factor in the equipment. Aside from the high voltage, both regulated

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2 to 18.1 Mc

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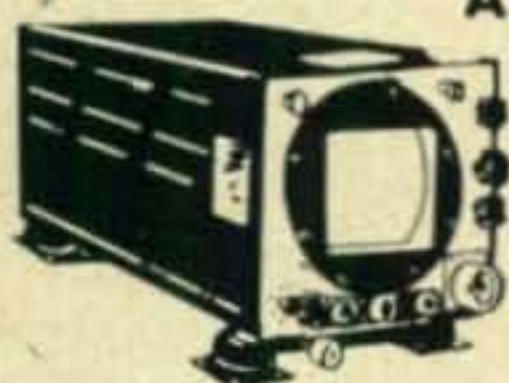


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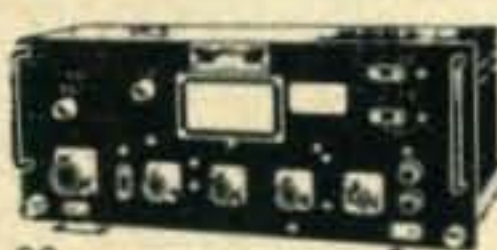
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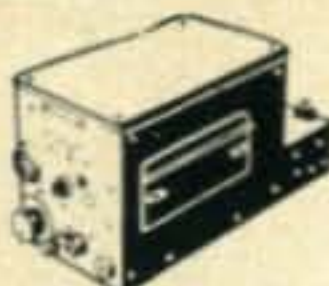
195 to 420 Kc, made by Satchel-Carlson. Works on 24-28 volts DC. 135 Kc. IF. Complete with 5 tubes. Size 4" x 4" x 6". Wt. 4 lbs. BRAND NEW Used, less tubes \$2.95

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screen and bias voltages are supplied on the same chassis. Regulation is accomplished by the use of 6 voltage regulator tubes.

Summary

After checking out the new Cosmophone "1000," we can only report that we find the unit to be a successful "first" in the way of a one package tabletop kw station for ssb.

Barry Briskman, K2IEG

SIDEBAND [from page 57]

QSL chores. Address Art Cattoni, P.O. Box 43, Bello Horizonte, Brazil.

Recently I read somewhere about the necessity for rules and regulations to overcome the chaos which occurs when a new country makes its appearance. For the benefit of the initiated, may I say that such a problem and the answer to it would tax the ability of Solomon. Who actually wants it solved? Where would the fun and the excitement of shooting big game in Africa be if you were able to travel in a plate glass enclosure? What an empty feeling would exist if we were able to snare a rare one without having to fight for it. . . . Even with a "California Kilowatt" and a six element beam eighty feet in the air! Nothing can touch the thrill and exhilaration one feels when the far off station acknowledges your call, when there are still ten or twelve others calling on the rare one's frequency. Then when you are sure that your call is safely etched in the other fellow's log and you shut off the big switch to catch a breath of air and try to relax, isn't it nice to listen for hours to all the other "cut-throats" trying for a contact? Sure you are enraged when lots of the gang try to get a contact by using CW on the DX'ers frequency. When he pleads "please give the W-8 a chance fellows, you will all get your turn" do you wait patiently? Like — you do! You turn up the audio gain and "tail end" like all those eager beavers you have been cussing. That night after you have tried for hours to fall asleep, because you are still unconsciously calling the rare one, and at the same time promising yourself 'never again', what is the first thing you do in the morning? You go to the mail box hoping the latest DX bulletin is there with news of another rare DX/pedition. So again I say, "should we try to do something about these pile-ups?" The truthful answer is "Yes, let's have more pile-ups." Would Humberto have number one "Worked 175" hanging in his shack if he disliked pile-ups? Think about it fellows.

George of UA1DZ has added a final amplifier to exciter and has been putting a big signal into the Eastern USA around 2200 EST. Ian MP4BBW who qualified for his "Worked 100" with a barefoot KWM-1 is also building a new final.

For further information, check number 31 on page 126.