New Life For The BC-348

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A lot of 348's are still in use today in spite of their design being over ten years old. The 348's primary use was by the airforce for their aircraft. A used 348 in good condition is an excellent buy and as the design is still up to date it need not be changed too much. The sensitivity of the 348 with the Xtal filter out is approx. 3 microvolts to produce 10 milliwatts into a 4,000 ohm load. From this you can imagine how a phone station would sound with the Xtal filter in. Therefore a very desirable feature would be an Xtal phase control, since the 348 only has a 1 position Xtal filter (on or off). Another desirable feature is an "S" meter for the would-be phone men who like to give accurate db readings.

Installing An "S" Meter

The first thing I did in converting mine was to add an "S" meter. The number of parts were kept to a minimum so it could be installed in the dynamotor well of the 348. The meter was installed above the on-off CW Osc switch. The variable resistor, R2, the zero adjustment control was also mounted above the CW Osc on-off switch alongside the meter. The tube socket was mounted on a bracket and screwed to the chassis in the dynamotor well with R1 mounted on this bracket. The heater of V1 can be wired for 6 or 12 volts but is shown wired for 6 volts. All leads running away from V1 and R1 should be shielded. The 150 volts for the plates of V1 can be obtained from the screen pin of the audio output or any other point having about 150 volts. (Higher voltages increase current drain unnecessarily.)

Theory of Operation

The theory of operation is as follows: R2 is adjusted for equal voltage at pin 3 and pin 8 of V1. The AVC voltage through R1 will drive the one cathode negative with respect to the other thus upsetting the balance and causing an upwards deflection of M1. The amplitude of the AVC will be controlled by R1 and once it is set should remain constant and only R2 should be moved for the zero adjustment.

Installing The Phase Control

Actually the 348 has a phase control already built in but it is built inside and can't be reached when in the cabinet. All we have to do is remove it and mount it on the panel. It should

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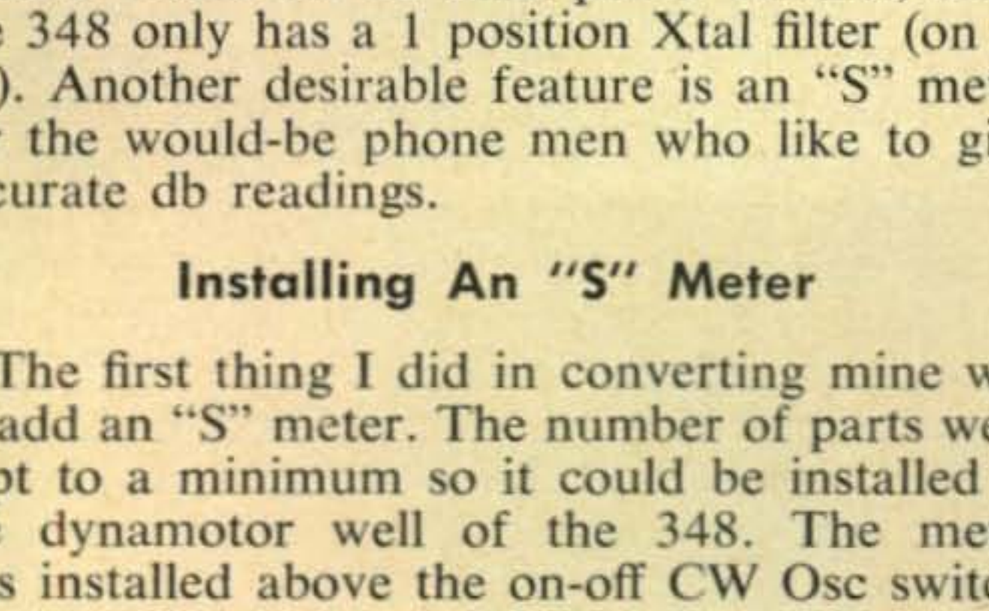

Fig. 1—Circuit of the "S" meter added to the 348.

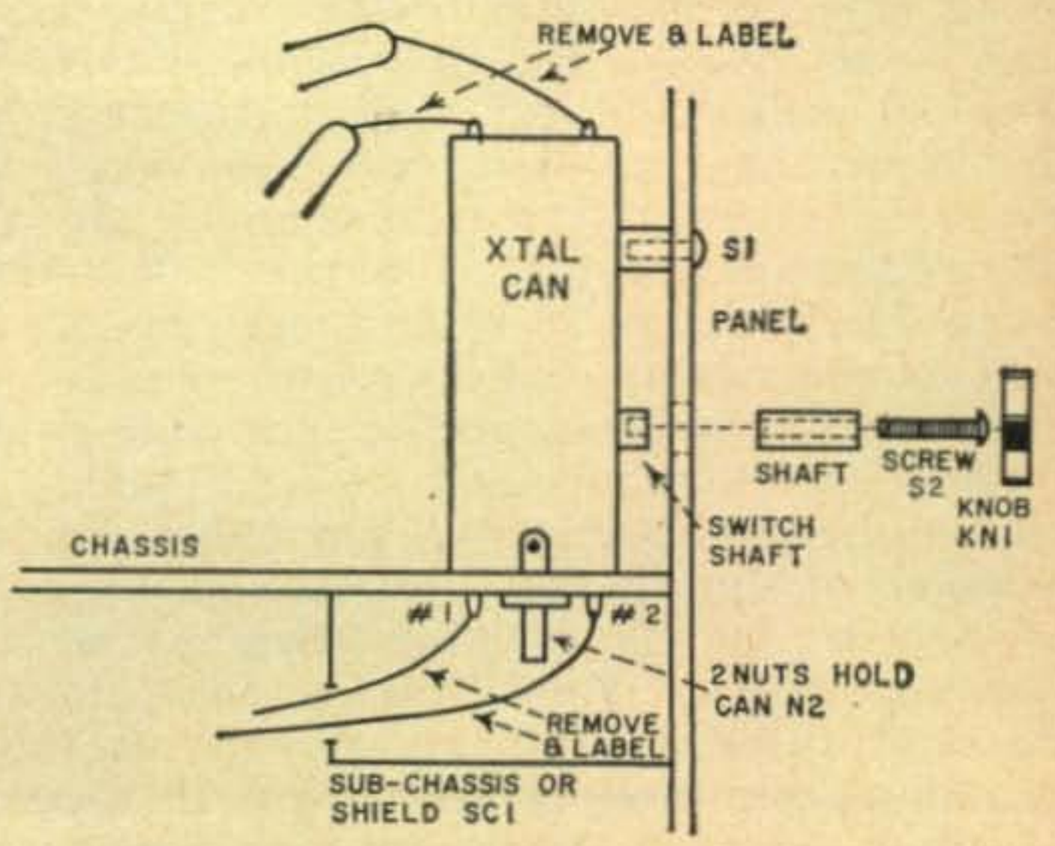

Fig. 2—Cross section view of the crystal filter.

MARS BULLETINS

First Army MARS SSB Technical Net

Wednesday evening, 9 PM EST on 4030 kc upper sideband.

May 6—"American Antarctic Communications Adventures" by Amory H. Waite Jr., Project Engineer, Exploratory Research Division, Communications Dept., U.S. Army Research & Development Laboratory, Fort Monmouth.

May 13—"Telemetering For Guided Missiles" by J. R. Popkin-Clurman, W2LNP, Pres. & Director of Research, Telechrome Mfg. Corp.

May 20—"The Megacoder" by Harry Kihn, Member of Technical Staff, RCA Laboratories.

May 27—"Novel Tuning Methods At UHF & Lower Micro-Wave Frequencies" by Bernard D. Nadler, Electronics Engineer, Lewyt Mfg. Corp.

Upon completion of the May schedule, this technical net will recess until September.

Air Force MARS Eastern Technical Net

Sundays 2-4 PM EDT—3295, 7540, 15,715 kc

May 3rd—"RF & X-Ray Measurement In The Field". Anthony T. DeMinco and Robert L. Dondero, Project Leaders, Directorate of Technical Services, Rome Air Development Center.

May 10th—"Microwave Communications Systems". John F. Longley, Bell Telephone System.

May 17th—"Basic Transformer Theory". Robert W. Gunderson, Braille Technical Press.

May 24th—"Basic AC Systems". Robert W. Gunderson, Braille Technical Press.

May 31st—"Crystal Control and Adjustments To Quartz Crystals". Harold C. Reynolds, Philco Corporation.

Air Force MARS Western Technical Net

Sunday 2-4 PM PST—7832.5 kc, 3295 kc, and 143.46 mc.

May 3—"Organization Facilities & Operation of a Modern Communication System". Mr. P. C. Christensen, Chief Engineer, Mackay Radio, San Francisco.

May 10—"Wide Band Micro-Wave Telemetry". Mr. Fred Barry, Manager, Equipment Development Div., Philco Corp.

May 17—"High Impedance Modulation Systems for Klystrons". Mr. Gene Tallmadge, senior project Engineer, Levinthal Electronics Products Inc., Palo Alto, Calif.

May 24—"Electronics in Medicine". Dr. J. Phillips Sampson, USC Medical School Teaching Staff.

May 31—"Equipment Utilization and Conversion". USAF MARS Western Technical Net Members.

equipment is now ready for use and either earphones or the loudspeaker may be used. The mike is a T-17 although any good carbon mike may be used.

Many questions have been asked as to the possibility of converting this equipment as well as the BC-1335 to Citizens Band Class D. Unfortunately we were not fully convinced of this at the beginning, but we have worked out a solution which is satisfactory. Citizens Band, Class D requires crystal control on the transmitter. This is not fully true of these FM equipments. We have worked out such circuit changes as are necessary and next month will convert the BC-659 to AM for citizens band (as well as other bands) and this should satisfy many readers. Likewise July will see the BC-1335 so converted for the same purpose. ■

73, Ken, W2HDM

SUPERPOWER [*from page 46*]

tion of station W6BXL were sent to the laboratories of UCLA where they were calibrated against a known standard. The results of this follow:

	LOW POSITION		
	Volts	*Amperes*	*Power*
FCC Inst's. as read	2650	.175	463 watts
FCC Inst's. as calibrated	2850	.177	504 watts

	HIGH POSITION		
	Volts	*Amperes*	*Power*
FCC Inst's. as read	3800	.330	1254 watts
FCC Inst's. as calibrated	4150	.348	1444 watts

On the basis of the facts evidenced in the commission's inspection, the amateur license of Mr. Bailey, W6BXL was suspended for a period of six months effective June 16th, 1958. Turn down those Variacs Men! ■

BC 348 [*from page 47*]

be installed as close to the crystal can as possible. It was installed above the MVC control and BFO. The original knobs of the 348 are too big and have to be replaced by pointer knobs, which should also be used for the phase control. After it is installed mark the sharpest point for the phase control.

To get at the phase control we must first remove the crystal can as follows:

( ) Remove S1 shown in fig. 2
( ) Remove crystal knob KN1 by loosening Allen screw.
( ) Remove the S2 screw that appears when the knob KN1 is removed.
( ) Remove the two wires on top of the can and label them so you can put them back in their proper places.

( ) Turn the set over and remove the sub chassis SC1 or the shield over the bottom of the crystal can (should be one screw holding it).

( ) After removing the sub-chassis (SC1) remove the two wires underneath that are connected to the crystal can and label them.

( ) Next remove the two remaining nuts (N2) and slide the can out (in some sets you will have to do a little jiggling to get it out).

( ) Next lay the can down and remove the screw below the switch shaft, #S3, and slide the crystal structure out. (It may be varnished and thus difficult to remove.) The appearance of the assembly is shown in fig. 3A. *Do not move the coil or damage it in any way.* At the bottom of the crystal can you will see a condenser, #K1.

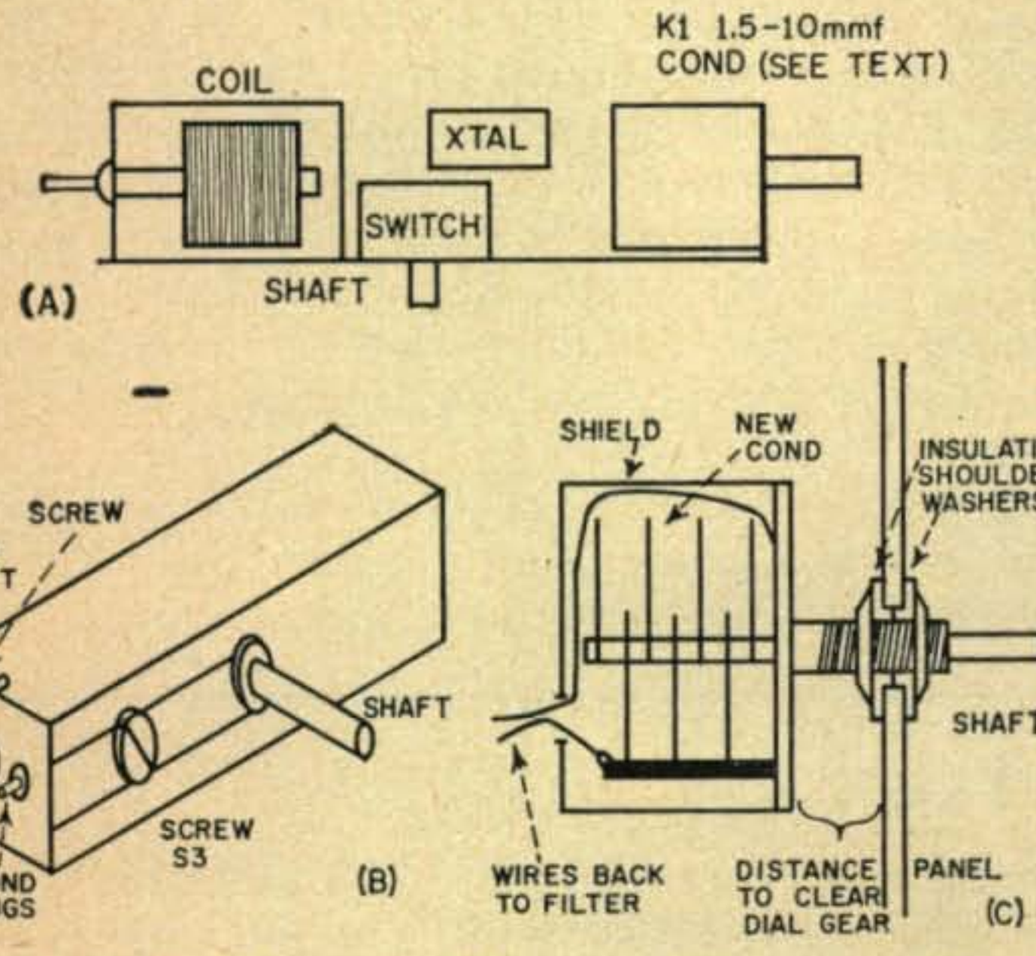

Fig. 3—Modification of the crystal filter to provide an external phasing control. View A-Crystal Filter removed from shield can. View B-Crystal Filter can be removed from the 348. View C-Details for mounting the phasing control on the front panel. Note use of shoulder washers.

( ) Remove this condenser and remove the two wires that are connected to it and label the one connected to the rotor and the other connected to the stator.

( ) Now drill a hole in the cabinet to mount a new condenser, such as the #PL-6000 or equivalent, that has a longer shaft. The hole should be drilled so it is far enough over to clear the dial gear as in fig. 3C.

( ) Install two shoulder washers in this hole so the condenser will be insulated from the chassis.

( ) Next make a shield to cover the condenser, making sure that it does not touch the stator or rotary plates of the condenser. **Be sure! !**

( ) Mount the condenser and shield making sure the condenser is *not* grounded and the shield *is* grounded.

( ) Now extend the leads that went to the

For further information, check number 52 on page 142

old condenser in the can and run these leads through the hole in the bottom of the crystal structure where the shaft of the old condenser went through.

( ) Put the structure back into the can and replace the can making sure the two wires on top and bottom of the can are put in their proper places and soldered.

( ) Screw the can in with the two (N2) nuts and one (S1) screw.

( ) Connect the two leads that went to the original condenser to the new PL-6000 making sure you put the stator and rotor leads back correctly.

( ) Replace the sub-chassis SC1 and put a knob on the new PL-6000 shaft. The knob's set screw should be filled with wood filler or some other substance to keep your fingers from adding capacity to it.

In place of the original condenser I substituted the Cardwell PL-6000 which is 1.5-10 mmfd. The only drawback to the PL-6000 is that it is a large condenser and the smaller you can get the better as there is a limited amount of space. There is a 9 plate midget condenser of the same rating and about one half the size whose number is Underwood CV-140-A. Any condenser can be used as long as it is 1.5-10 mmf.

I have had very good performance from the 348 and cannot find any areas to improve on since it was converted. ■

HQ 129X [*from page 40*]

Diode type delayed AVC[3]. Modifications also improved "S" meter sensitivity and first audio stage operation. All parts associated with the noise limiter and second detector tube (V6) are removed as indicated in the diagram fig. 4. The space previously occupied by the 6H6 tube (V6) will now provide room for the TNS circuitry and associated tubes above the chassis. They may be mounted in any convenient way, such as in a 2½ x 2½ x 4" Minibox or on a Vector shielded can assembly arrangement. In this particular case, the TNS circuitry was made as a subassembly in the Minibox, terminating leads brought out the end of the box and wired to the proper points after removing the 6H6 socket, which leaves a large convenient hole. The Minibox was mounted to the chassis using the old 6H6 tube socket mounting holes.

Using the existing terminal strips from which old parts are removed, the new parts are wired as per fig. 5. The 500 *k* TNS squelch control is mounted where the ANL switch was removed. The 50 *k* delayed AVC control is mounted on the back chassis apron near the antenna and ground terminals of the receiver. This requires drilling a ⅜" hole. The 50 *k* control may be adjusted to give a desired range. A complete analysis of the Sinking Diode delayed AVC circuit is given in the Radiotron Designer's Handbook[3]. Its principle is to hold the AVC