Heathkit of the Month #117:
by Bob Eckweiler, AF6C

AMATEUR RADIO - SWL

Heathkit HX-11
CW Transmitter

Introduction:

In late May the world community of ham radio, as well as the Orange County Amateur Radio Club, lost an icon, Chip Margelli - K7JA. At the time, Chip was president of the OCARC – W6ZE; he will be sorely missed. For more on Chip see "K7JA" sidebar.

Chip was interviewed on the Amateur Radio Roundtable podcast (9/6/2016) by Katie Allen – WY7YL[1]. During part of the interview Chip talked about getting started in the hobby as a novice and commented that his first transmitter was a Heathkit HX-11 CW Transmitter (**Figure 1**). Other than a short mention in HotM #3 [2] the HX-11 has not been discussed here, nor really has its predecessor the DX-20. So, in memory of Chip, this month the HX-11 will be covered as well as the earlier DX-20.

The HX-11 was first announced in the fall of 1961 (see **Figure 2**) for $43.50. It replaced the DX-20 which had been selling since 1957. You can think of the HX-11 as a refined DX-20. They share the same tube lineup and the circuitry is very similar.

Here is a link to the index of Heathkit of the Month (HotM) articles:

http://www.w6ze.org/Heathkit/Heathkit_Index.html

1. Notes begin on page 11

Figure 1: Heathkit HX-11 CW HF Transmitter.

The HX-11 CW Transmitter Overview:

The HX-11 is an inexpensive entry-level CW transmitter that is primarily designed for the novice. It has a plate input power of 50 watts and the frequency is crystal controlled. In the sixties the novice license allowed up to 75 watts DC input, but the frequency had to be crystal controlled. In those days there were three HF novice bands:

80 meters: 3,700 to 3,750 kc [3]
40 meters: 7,150 to 7,200 kc
15 meters: 21,100 to 21,250 kc.

The HX-11 will also transmit on the 20 and 10 meter bands for the novice who successfully upgrades. It can also work with a VFO such as the Heathkit VF-1, but that requires some circuit modifications to the oscillator stage. If you wanted to go back to using crystal control, the modification has to be undone. Unlike the DX-40 and its successor, the DX-60 series, the HX-11 (and DX-20) did not have the capability to power a VFO, so an external power supply is required. Heathkit never sold a power supply kit for this purpose.

Operating Crystal Control:

Custom crystals were on the expensive side and many hams only had one or two for each band they worked. You called CQ and then had to tune around to find who was answer-

ing you. QSOs were rarely on the same frequency. After WWII the radio surplus market was flooded with crystals. Many used FT–243 holders [4] and some were already cut for the novice band. They were inexpensive, but those frequencies got very crowded. Some companies bought a lot of the surplus crystals and reground them for the ham/novice bands.

The HX-11 Controls and Connectors:

The HX-11 controls and connectors are shown in **TABLE I**. Of interest is the crystal access. To change frequency a 2" hole plug, located on the left side of the cabinet, must be removed and the crystal mounted just inside swapped, and the hole plug reinstalled. If left off, it could cause a dreaded TVI complaint.

The Heathkit HX-11 Specifications:

The specifications of the HX-11 and its predecessor the DX-20 are shown in **TABLE II**. Mostly they are identical. The HX-11 will still cover the 11 meter band with the correct crystal, but by the time the HX-11 was released 11 meters had been reallocated for citizen band use. The output impedance range is reduced due to the inclusion of a low-pass filter not found on the DX-20.

Operating the Heathkit HX-11:

Prior to transmitting with the HX-11 it is important that the correct crystal for the band and desired frequency be installed in the crystal socket. The proper frequency crystals are given in **Table III** for the bands as they were in the late 1950s and 60s [5]. It is also important that the proper antenna is connected for the desired band. Initial testing and tuning practice should done into a 50Ω dummy load. A 40 watt 120 V light bulb can be used for this purpose.

With the **TRANSMIT-STANDBY** switch in STANDBY, the **OPERATE - TUNE** switch in TUNE, and the **BAND SWITCH** set to the

Heathkit HX-11 Front Layout

Top Row Center:
- Meter: 3 mA full scale, 500Ω (D'Arsonval movement)
  - Scale (top): **0, 50, 100, 150, 200 MILLIAMPERES**
  - Tic marks every 10 mA.(Plate)
  - Scale (Bottom): **0, 2, 4, 6, 8 MILLIAMPERES**
  - Tic marks every 0.4 mA (Grid)

2nd Row Center: (below meter)
- Switch, slide, DPDT (horizontal)
  - **GRID**, **PLATE** (meter switch)

3rd Row (L to R):
- Variable capacitor, 50 µµf
  - **OSCILLATOR** (tuning)
- Switch, rotary, two wafer five position
  - **BAND SWITCH, (80, 40, 20, 15, 10)**
- Variable capacitor, 3-section: 50 µµf, 50 µµf, 50 µµf
  - **AMPLIFIER** (plate tuning)

Bottom Row (L to R):
- Switch, slide SPST (vertical)
  - **ON, OFF** (Power)
- Switch, slide DPST (vertical)
  - **TRANSMIT, STANDBY**
- Variable Capacitor, 2 section: 420 µµf, 420 µµf
  - **LOADING**
- Switch, slide SPDT (vertical)
  - **OPERATE, TUNE**
- Jack, ¼" Phone, Shorting upon removal of plug.
  - **KEY**

Heathkit HX-11 REAR Layout

Rear Chassis (L to R - Viewed from rear):
- Power cord, 2-wire, Heyco strain relief
  - **117 V. A. C., 2 AMPS**
- Fuse Holder, Bayonet type
  - **FUSE**,2 AMPS
- Coaxial connector, UHF, SO-239
  - ⟵ **R. F. OUTPUT**
- 2-wire A. C. Outlet
  - **117 V. A. C., ANT. RELAY**
- #10-32 x ⅝" bolt with two #10 nuts for wire attachment
  - **GND.**

Heathkit HX-11 Other Layout

Left cabinet side,~ 2" from front and ~ 3⅛" from top:
- 2" chrome hole plug with knob handle
  - Access to crystal socket to change crystal.

TABLE I

Figure 2: Introductory ad For the HX-11 From the Fall & Winter 1961 - 62 Catalog.

planned operating band, the transmitter **ON – OFF** switch is moved to ON. Once the tubes warm up (~ 60 sec.) tune up can commence.

Set the meter switch to **GRID**. With the key closed (or removed from the jack) the TRANSMIT-STANDBY switch is moved to TRANSMIT and the OSCILLATOR control is adjusted for 2 to 2½ mA on the meter on all bands except 10 meters, where it should be peaked on the meter scale (4 to 5 mA typically). Plug a key into the **KEY** jack, or open the key if one is already plugged in.

With the grid drive adjusted properly, turn the **LOAD** control to '**0**' (fully CCW), move the meter switch to **PLATE,** and then move the OPERATE - TUNE switch to OPERATE. Press the key, and immediately adjust the **AMPLIFIER** control for minimum current on the meter. Open the key. Increase the LOAD control a division or two, press the key and again adjust the AMPLIFIER control for minimum current on the meter. This time the minimum current will be higher than it was before. Continue this process until the minimum current reads 120 mA. Recheck the GRID current adjusting it to 2 to 2½ mA (or peak it on 10 meters). The transmitter is now correctly tuned. The reason the drive needs to be peaked for maximum on 10 meters is because, on this band, the final is acting as a frequency doubler and requires the extra drive to get maximum power out.

THE HX-11 V.S. THE DX-20:

As mentioned above, the HX-11 is an updated DX-20 with some significant changes:

The DX-20 is not fused. The HX-11 is fused at 2 A. It has a bayonet type fuse holder on the rear panel.

The DX-20 meter, is metal framed with an undamped iron-vane movement. It is replaced with a plastic case D'Arsonval movement meter. This meter is damped; the DX-20 meter swings wildly when sending CW. Both meters are 3 mA full scale with 500Ω internal resistance. However, the meter scales changed from 6 mA to 8 mA in the GRID position, and from 150 mA to 200 mA in the PLATE position of the meter switch. This change results in the changing of the meter shunt resistors between the models. The new meter mounts with a U-bracket in the rear instead of by nuts on two meter mounting studs.

Specifications

SPECIFICATION:	DX-20	HX-11
RF Power Input:	50 Watts	50 Watts
Output Impedance:	50 – 1000 Ω	50 – 600 Ω
Output Coupling:	Pi-network (coaxial)	Pi-network (coaxial)
Output Filter	(none)	Low-pass; cutoff at 34 MC.
Operation:	Crystal - external VFO*	Crystal - external VFO*
Band Coverage:	80 - 40 - 20 - 15 - 11 - 10	80 - 40 - 20 - 15 - 10*
Tube Complement	5U4GB rectifier 6CL6 oscillator 6DQ6A final amplifier	5U4GB rectifier 6CL6 oscillator 6DQ6A final amplifier
Power Requirements:	117 volts AC, 60 cycle, 160 watts	117 volts AC, 60 cycle, 160 watts
Fuse	n/a	2 AMP
Cabinet Size:	13" W x 8½ H x 7" D	13" W x 8½ H x 7" D.
Net Weight:	16 lbs.	16 lbs.
Shipping Weight:	18 lbs.	17 lbs.

* (See Text)

TABLE II

HX-11 CRYSTAL FREQUENCY CHART

BAND METERS	CRYSTAL BAND	MIN. FREQ.	MAX. FREQ.
80/75 M	160 M	1750 kc	2000 kc
80 NOVICE*	160 M	3500 kc	4000 kc
80/75 M	80 M	1850 kc	1875 kc
80 NOVICE*	80 M	3700 kc	3750 kc
40 M	80 M	3500 kc	3650 kc
40 NOVICE*	80 M	3575 kc	3600 kc
40 M	40 M	7000.kc	7300 kc
40 NOVICE*	40 M	7150 kc	7200 kc
20 M	80 M	3500 kc	3587 kc
20 M	40 M	7000 kc	7175 kc
15 M	40 M	7000 kc	7150 kc
15 NOVICE*	40 M	7034 kc	7083 kc
10 M	40 M	7000 kc	7425 kc

* **Caution:** These novice bands have changed.

TABLE III

The HX-11 has a brass sleeve that fits around the final amplifier tube (6DQ6A) that is wired to provide neutralization. It is not adjustable. The DX-20 lacks this feature.

Both radios have a DPST slide switch for the TRANSMIT - STANDBY switch. One section switches on the B+. On the DX-20 the other contacts are unused. Pictorial 4 in the DX-20 assembly manual states "EXTRA SWITCH CONNECTIONS FOR OPTIONAL ANTENNA RELAY". In the HX-11 these switch contacts are wired to provide 117 VAC to a two-wire AC outlet on the rear panel for an antenna relay when in the TRANSMIT position. (External contacts on the antenna relay can be used to mute a receiver.)

The HX-11 adds a low-pass filter in the RF output line. With a cutoff frequency of 34 mc, it strongly reduces any harmonic contact that might be a cause of TVI. Due to the ad-

dition of the filter, the impedance matching range of the transmitter output is reduced.

The cabinet is very similar to the DX-20 cabinet but sports a new part number and green color. The front panel keeps the same physical layout, but adds a new green and beige paint scheme to match the ham equipment of the time, such as the Apache and Mohawk, HM-11 SWR bridge, etc. The knobs are also new; their style is identical to the DX-20 knobs, but they sport new colors. The large knobs are grayish-green and the small knobs are light tan.

There are a few minor component changes, mostly in the 6CL6 oscillator and metering circuits, as well as the new low-pass filter. These changes are briefly discussed in the circuit discussion section.

HEATHKIT HX-11 CIRCUIT DESCRIPTION:

The HX-11 circuit can be divided into four sections: The power supply, the oscillator, the final amplifier and the metering circuits. (see **FIGURE 5** on page 10 for the schematic). A larger schematic is also available online [6].

The Power Supply Circuit:

The power supply is transformer based with a single 117 VAC primary. The primary circuit is fused at 2 amperes and bypassed in each leg by a 0.005 µf 1.4 KV disc ceramic capacitor. The A.C. line is also connected to an A.C. socket on the rear panel (**ANTENNA RELAY**) through a set of contacts on the STANDBY - TRANSMIT switch. This socket is not fused.

The transformer secondary has three windings. The first is a dedicated 5V 3A winding for the 5U4GB rectifier tube filament. The second winding is a 6.3V 2A heater winding for the 6CL6 oscillator and 6DQ6A amplifier tubes. The other winding is a 1,200 volt center-tapped, 120 mA winding feeding the plates of the 5U4GB dual rectifier tube. The DC at the cathode of the tube is filtered by a 5 Henry choke and two 20 µf capacitors in series. Each capacitor is shunted by a 15 KΩ 10 watt resistor. These resistors, in series, act as a bleeder resistor and provide a minimum load required for the choke input filter. In transmit the supply provides 420 volts DC under load to the final amplifier and oscillator. The tap between the two capacitors provides a voltage of about 180 V to the oscillator tube screen grid. It is less than half the voltage due to the additional current being drawn through the upper resistor. A 0.1 µf 1200 volt capacitor "tunes" the power supply choke. This reduces the "surge voltage" when the current through the filter choke drops below the critical choke current [7]. This allows a lower bleeder current in key-up conditions.

The Oscillator Circuit:

A 6CL6 pentode tube is wired as a classic crystal Colpitts oscillator. Surprisingly, Heath has this tube running with 420 volts on the plate, which is substantially above its 300 volt maximum rated plate voltage. The circuit is identical to the DX-20 except for one capacitor in the feedback divider which was changed from 220 µµf to 180 µµf. The oscillator tube's cathode is connected to the keying line so the oscillator is keyed along with the final amplifier. The plate of the oscillator is tuned by L2 and C6, the OSCILLATOR capacitor. Additional capacitance (C8) is switched in on 80 meters. On 80, 40, 20, and 15 meters the plate is tuned to the desired band. On 10 meters it is tuned to 20 meters [8]. The oscillator acts as a doubler when the next lowest band crystal is used on 80, 40 or 20 meters, a tripler on 15 meters, and a quadrupler when an 80 meter crystal is used on 20 meters. On 10 meters it acts as a doubler, with the amplifier also a doubler.

The Final Amplifier:

The final amplifier circuit uses a 6DQ6A

tube which is a TV horizontal sweep tube. When Heath first designed the DX-20 a lot of testing was done on the use of this tube as an RF power amplifier. At the time it was in mass production for the TV market and inexpensive. (Heath's price was $1.02).

The tuned signal from the oscillator is fed to the grid of the 6DQ6A tube through a small capacitor and 22 Ω stabilizing resistor. Grid bias is produced across R4, a 27 KΩ 2-watt grid resistor. Should grid drive be lost, the tube will draw excessive current and could be damaged as there is no clamping circuit. A grid bias of about minus 50 volts is developed with typical grid drive from the oscillator. To protect the tube one should alway set the OPERATE - TUNE switch to TUNE until grid drive is established. This switch is in the screen circuit of the amplifier tube and grounds the screen when in the TUNE position. In the OPERATE position the grid is connected to the 420 volt B+ through a 50 KΩ 10-watt resistor (R7). The screen current of about 5½ mA results in a screen voltage of 150 volts. On 80 through 15 meters the amplifier operates straight through, but on 10 meter it doubles the 20 meter signal.

The plate circuit is a standard pi-network and is identical, down to the part numbers, to the DX-20. The AMPLIFIER tuning capacitor has three 50 μμf sections (C15A – C15C). On 80 and 40 meters all three sections are used. On 20 through 10 meters just one of the sections (C15A) is used. On 80 meters it would be possible to accidentally tune the pi-network to 40 meters if the wrong dip in current is used when adjusting the AMPLIFIER control. To prevent this an additional fixed 68 μμf 4 KV capacitor (C14) is switched across C15. The pi-network LOAD control (C16A, C16B) consists of dual 420 μμf sections in parallel, along with a fixed 150 μμf capacitor (C15) also in parallel.

Heath added a low-pass filter between the output of the pi-network and the antenna connector on the rear chassis. The filter has a cutoff frequency of 34 mc. This internal filter is not in the DX-20, though an external low-pass filter may be installed.

Unlike the DX-20, Heath provides some neutralization in the HX-11. A bit of research showed no problems with the DX-20 that neutralization would have fixed. Perhaps Heath added it due to a minor layout change? Neutralization cancels out the plate to grid capacitance that can cause self-oscillation. Often it uses a variable capacitor to couple a bit of the amplifier output to the previous stage at a point where it provides negative feedback. In the HX-11 the capacitance is fixed. A brass plate is partially wrapped around the tube. This plate is connected to the DC end of the oscillator tank circuit. A 0.001 μf feed-through capacitor replaces a 0.005 μf disc ceramic capacitor used in the DX-20. It is not adjustable but does provide some negative feedback. One caveat is that the brass plate has the full 420 volt B+ on it. BE CAREFUL if you are testing with the HX-11 out of the cabinet.

The Metering Circuit:

Heath decided to use a new meter in the HX-11. This meter uses a damped D'Arsonval movement that doesn't bounce around wildly while sending CW. The new meter has the same sensitivity (3 mA full scale) and internal resistance (500 Ω) as the meter used in the DX-20. However, Heath changed the scale ranges of the meter, as mentioned previously. The grid scale was changed from 6 mA to 8 mA F.S. and the plate scale was changed from 150 mA to 200 mA F.S. This change of scales meant the meter shunt resistors needed to be changed. In the DX-20

Heath uses two precision 1% ½-watt resistors (500Ω for the grid shunt and 12 Ω for the plate shunt). In the HX-11 these resistors were replaced with new values and, surprisingly, regular 10% carbon resistors were used. Evidently Heath was not concerned with the accuracy of the meter reading and felt 10% was acceptable.

Calculating meter shunt resistors can be difficult. However there is a simple way to proceed if you realize that any milliampere meter is also a voltmeter. These meters both have a full scale range of 3 mA and an internal resistance of 500 Ω. From ohms law a voltage of 1.5 volts across 500 Ω will result in 3 mA flowing. To select the correct shunt resistor to make the meter read full scale all you need to do is shunt it with a resistor that will pass 5 (eight minus three) mA when 1.5 volts is applied. (1.5/ 0.005) or 300 Ω. Heath chose 330 Ω a standard value [9], which they probably had in large quantities.

The plate current is actually measured in the cathode which also includes control and

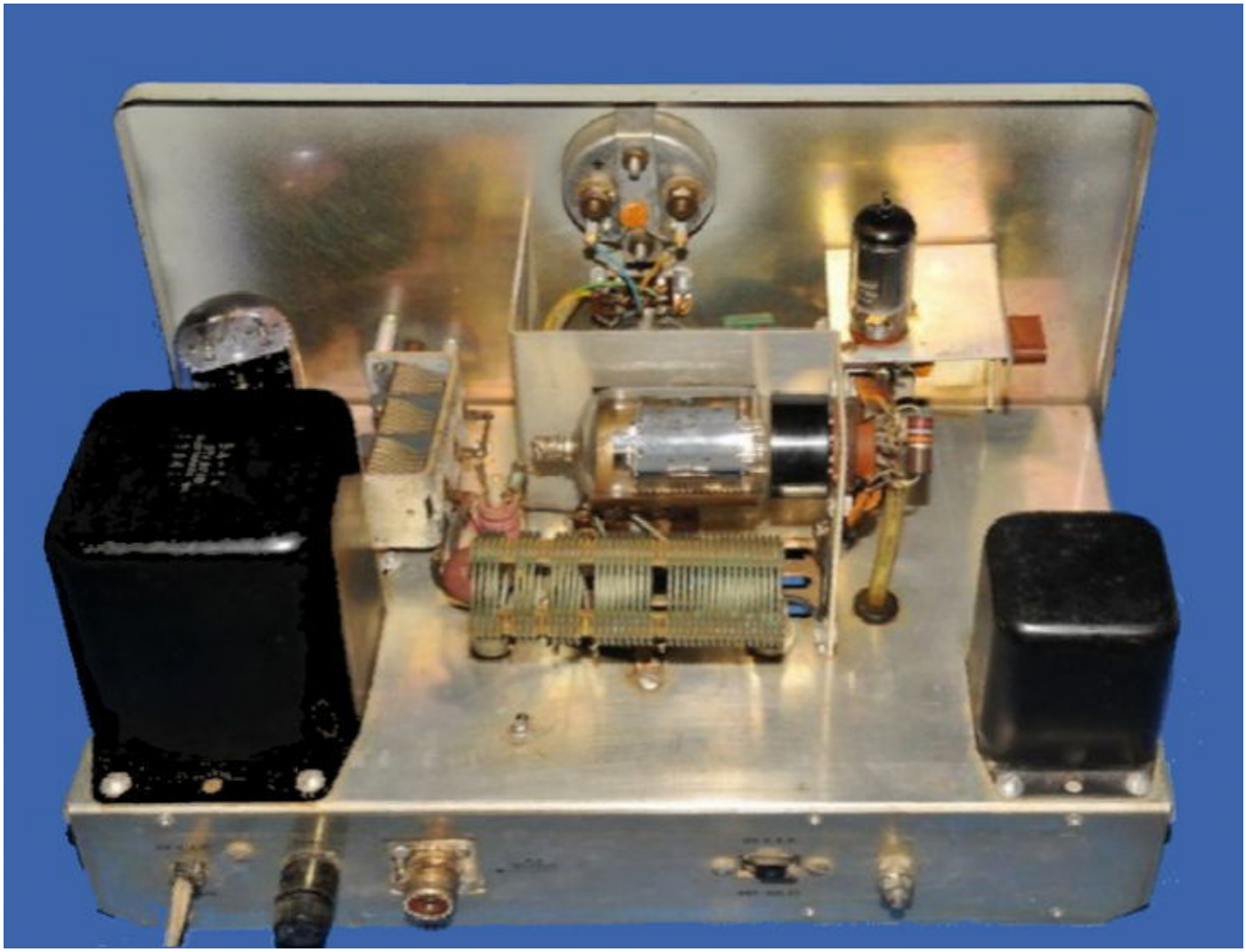

Figure 3: Inside top view of the HX-11. On the left is the large power transformer in front of the 5U4GB rectifier tube and the 3−section AMPLIFIER tuning capacitor. On the right is the power supply choke. The 6CL6 oscillator tube is on the platform to the right and the brown crystal socket is to its right. The 6DQ6A amplifier tube is mounted horizontally in the center alongside the plate tank coil. The brass neutralization plate can be seen partially wrapped around the tube. It is connected to the white feed-thru capacitor near the base of the tube. Along the back of the chassis is the power cord, fuse, antenna connector, relay socket and ground stud.

screen grid current, both of which are small compared to the plate current. For 200 mA full scale the shunt must draw 197 mA when there is 1.5 volts across it. From ohms law that resistance is 1.5/.197 or 7.615 Ω. Heath used an 8.2 Ω resistor in parallel with a 100 Ω resistor or 7.58 Ω which is quite close, but the 10% resistor tolerance seems excessive.

HX-11 Construction:

Figure 3 and **Figure 4** show the layout of the inside top and bottom of the HX-11. The layout is very clean. The oscillator tube and socket sit on an 'L'-shaped bracket that also holds the crystal socket. The oscillator tank coil sits out of view in the area below the meter, shielded by the 'Z' bracket that holds the 6DQ6A amplifier tube and socket. Below the oscillator tube and also hidden from view is the OSCILLATOR tuning capacitor, C6. This layout places the underside of the oscillator section and the final amplifier section in very close proximity, making the lead lengths between the tubes very short. The large off-white capacitor above the 5U4GB tube socket is the 0.1 µf 1.2 kV capacitor C26 that is wired across the 5 henry filter choke.

The layout is very similar to the DX-20 with the exception of the addition of the low-pass filter shielded enclosure. Its location, under the chassis, made it necessary to move the LOAD capacitor C16A & C16B to just behind the front panel, instead of near the rear of

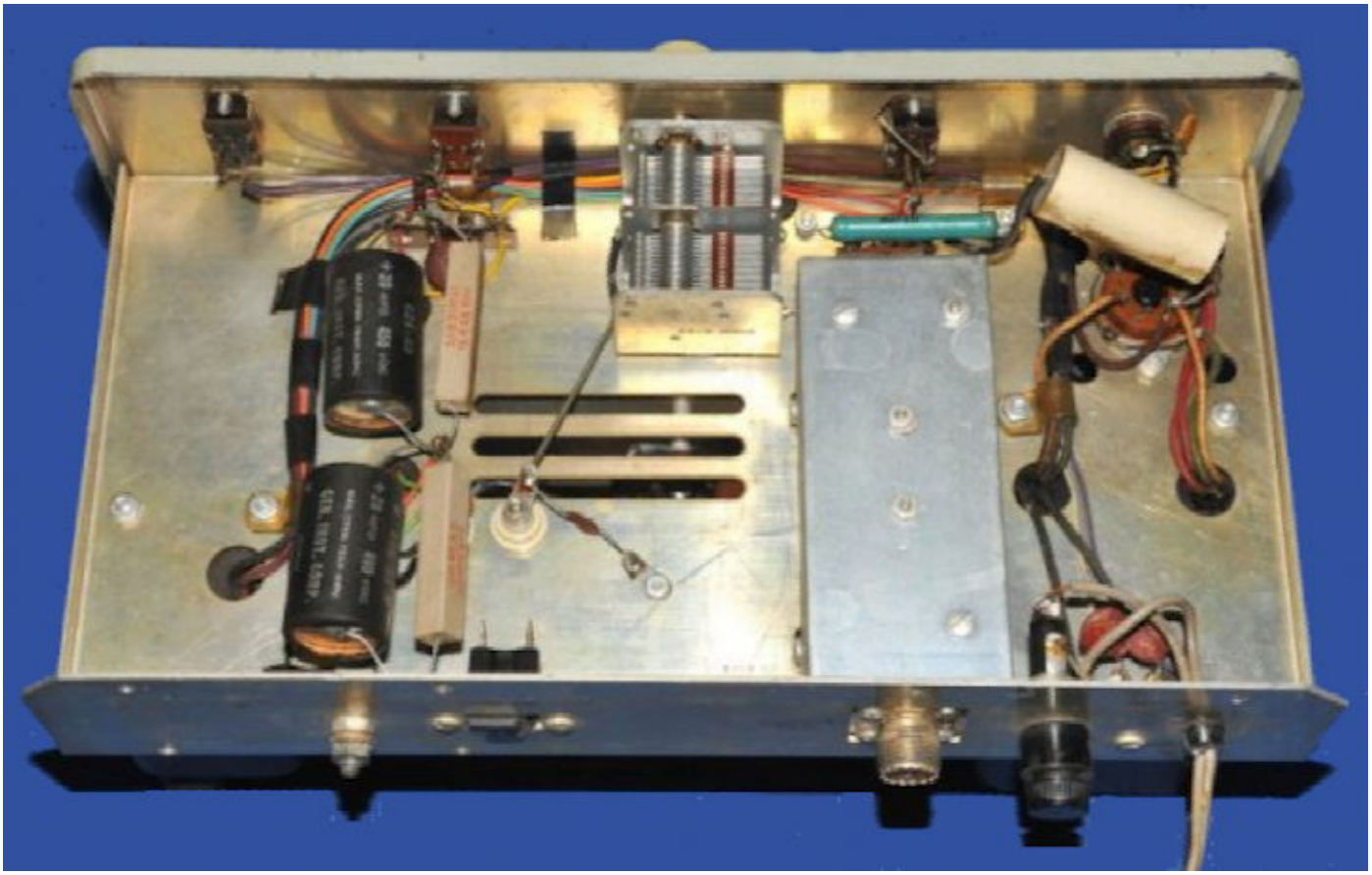

Figure 4: Underside view of the HX-11. The black filter capacitors are on the left adjacent to the two sand-colored bleeder resistors. To the right of the nearest bleeder resistor is a feed-through from the tank circuit. C30 comes off the feed-through to a ground lug. It is in parallel with the two section variable LOAD capacitor at the center top. At left center is the shielded low-pass filter. The green power resistor above it is the screen resistor. Near the top-right is the 5U4GB octal socket, the key jack and C26, the choke resonating capacitor. The leads coming through the two grommets are from the power transformer.

the chassis with an extended shaft, as in the DX-20. This creates longer lead lengths for C16. Perhaps this is why Heath decided to add the neutralization circuit?

HX-11 Restoration:

The HX-11 is somewhat rare, it stopped production in early 1965. The last catalog in the author's files that show it for sale is the Christmas 1964 catalog, where it was still for sale at the introductory price of $43.50.

This kit would make a good restoration project. It lacks can electrolytic capacitors which can make a project either complicated, or expensive. Replacement can capacitors sell in the order or $35 to $50 each. This uses axial can capacitors that are a lot less expensive and easy to find. Here are the things that one might consider changing or updating the HX-11 during a restoration.

A) As mentioned, replace the two 20 µf axial electrolytic capacitors [10].

B) Replace the two 0.005 1.4 kV capacitors that go from each power lead to ground. For safety sake replace them with approved Y2 safety capacitors that are designed especially for this purpose [11, 12]. At the same time a properly wired three-wire line cord should be added.

C) Replace the 10% carbon composition meter shunt resistors with more precision ones (1 or 2%). Select 300Ω for R5, 107Ω (a standard 1% value) paralleled with a precision 8.2Ω for the two resistors that make up R6.

D) Find a way to fuse the antenna relay socket. A simple internal fuse would work.

The rest of the restoration should follow well known routines. Cleaning up half a century of grit and grime, testing, and replacing damaged or out-of-tolerance components. Checking cleaning and lubricating moving parts,

Chip Margelli K7JA - SK

On May 25th the world of ham radio suddenly lost a top-notch operator and well known radio amateur. Those who knew him knew he was dedicated to the hobby and he has the awards and certificates to prove it. The last time I saw Chip was at our May 19th Orange County ARC (W6ZE) club meeting. He was our club president and was enthusiastically discussing our upcoming Field Day plans. Chip and his wife Janet KL7MF, our club Veep, were longtime members. Chip often was our speaker at the June meeting a week before Field Day teaching tips and techniques. He was our auctioneer at most of our recent yearly October auctions. Yes he dressed the part! Just like he did on the Tonight Show with Jay Leno. when he and Ken Miller - K6CTW took the challenge to compete head-to-head with the nation's champion text messenger; CW was victorious.

Chip worked for Yaesu and spent a lot of time in Japan. He learned to speak the language and made many friends while there. You may have spoken with him at a Ham convention when you visited the Yaesu booth. After Yaesu he worked for Heil Sound and InnoVAntennas and for HRO in Anaheim, managed by his wife Janet.

Chip was not just a DXer, he was also found on the other end of a pileup. He was one of the operators that put Albania on the air, and also was a part of COØUS from Cuba.

Chip is going to be missed for all he's done for amateur radio and by all the friends he's made along the way. This short sidebar barely touches Chip's accomplishments. It is directed more for readers of my Heathkit articles than for our club members, many of whom knew Chip well.

Here are some links about Chip, I'm sure a search on Google will bring up many more:

A 2016 interview of Chip by Katie Allen - WY7YL on the W5KUB podcast:
https://www.youtube.com/watch?v=pD47QNP603M

Chip and Ken blow away the phone texting champs on Leno's Tonight Show in this 3 min. 43 sec. WMV video:
https://www.w6ze.org/Newsletter/ITEMS-of-INTEREST/Morse_Competition.wmv

Remembering Chip on QRZed:
https://forums.qrz.com/index.php?threads/k7ja-chip-margelli-sk.866284/

SK, Bob AF6C

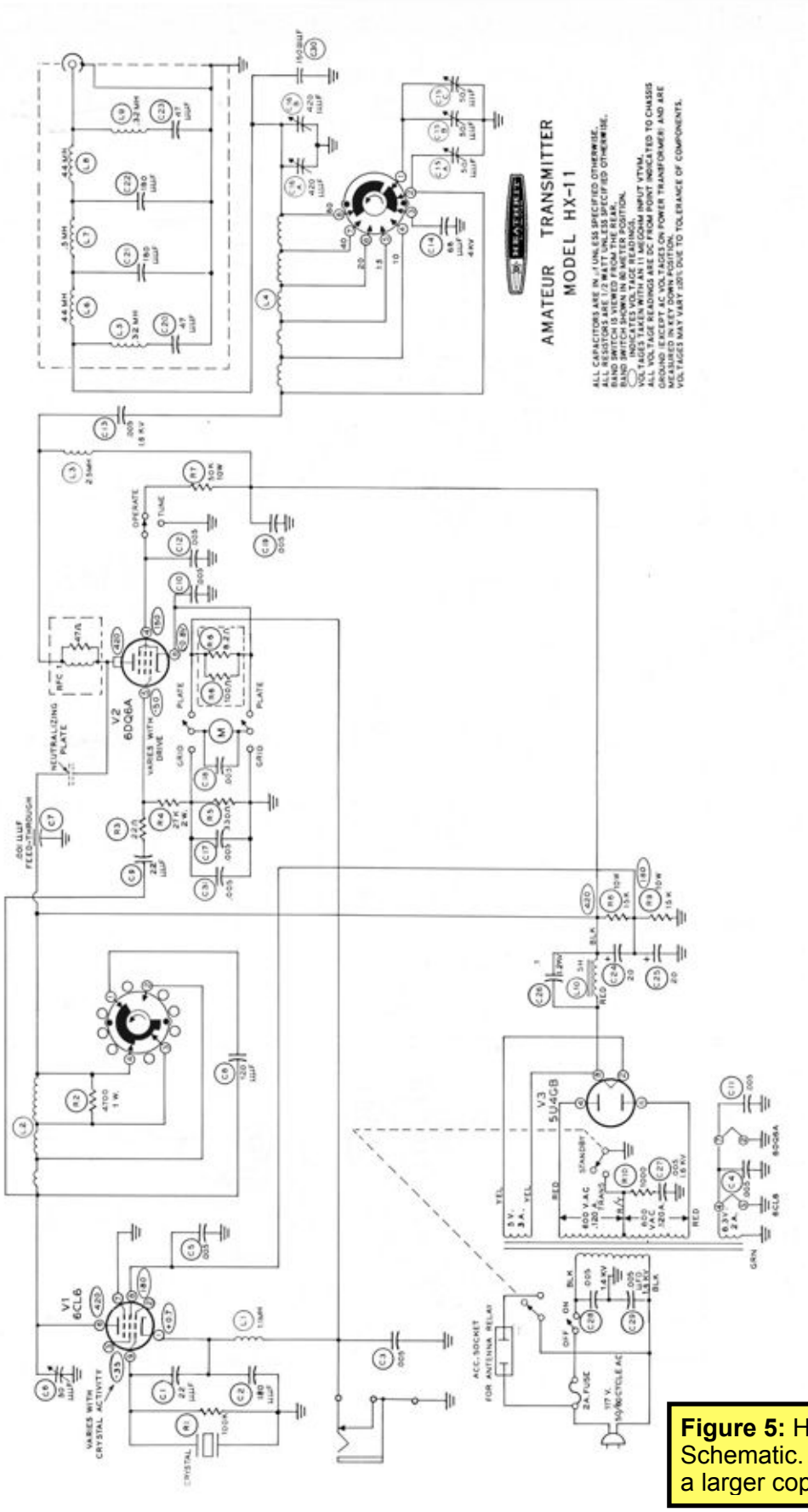

Figure 5: Heathkit HX-11 Schematic. See notes for a larger copy.

variable capacitors and pots, etc. A forum such as the Heathkit forums on Groups IO [13, 14] has a lot of hints and techniques to help restoration projects.

Final Comments:

Those of us who started our ham radio career in the era of the Novice license and learned code by operating CW in the small novice bands of 80, 40 and 15 meters find it a memorable period of time. The Novice license term was one year and NOT renewable. You had to reach 13 WPM in the one year the license was good for. Failure meant either trying for a Technician class (which was a lot different then), or find a new hobby.

Those days of sending CQs and then tuning the 50 kc (or on 15M 150 kc) looking for a reply are never forgotten. My contacts came regularly, usually on weekends or between the time I got home from Jr. High and dinner. After that it was homework and study time. I was late for dinner a lot in those days!

73, from AF6C

Remember if you are getting rid of any old Heathkit Manuals or Catalogs, please pass them along to me for my research.

Thanks - AF6C

Notes:

1. A link to the interview is given in the K7JA sidebar.
2. Heathkit of the Month #3 mostly discussed the Heathkit DX-40.: https://www.w6ze.org/Heathkit/Heathkit_003_DX40.pdf
3. In keeping with the period of the kit, kc is used instead of kHz, mc instead of MHz, and µµf instead of pf.
4. FT-243 crystal measures 13/16" X 3/8" x 1-1/8" tall (less pins). Pins are ⅜" long x 0.093" dia, and spaced 0.486". Up to 2 can be plugged into a standard octal tube socket.
5. Current novice band allocations are:

80	NOVICE	3525 kC	to	3600 kc
40	NOVICE	7025 kc	to	7125 kc
15	NOVICE	21025 kc	to	21200 kc
10	NOVICE	28000 kc	to	28500 kc

Current novice crystal frequencies for the HX-11 are:

BAND METERS	CRYSTAL BAND	MIN. FREQ.	MAX. FREQ
80 NOVICE	160M	1763 kc	1800 kc
80 NOVICE	80M	3525 kc	3600 kc
40 NOVICE	80M	3513 kc	3562 kc
40 NOVICE	40M	7025 kc	7125 kc
15 NOVICE	40M	7009 kc	7066 kc
10 NOVICE	40M	7025 kc	7125 kc

6. A larger schematic is available at: https://www.w6ze.org/Heathkit/sch/HX11.pdf
7. This is called a resonant choke power supply. For more information see:https://www.qsl.net/i0jx/supply.html
8. On ten meters the oscillator puts out a 20 meter signal that is then doubled in the final amplifier.
9. 270 Ω and 330 Ω are the closest 10% resistor value to 300 Ω. However, 300 Ω is a standard 5% value and 301 is a standard 2% and 1% value.
10. One source for axial electrolytic capacitors is Just Radio. Their website is: https://justradios.com they also have axial tubular mylar capacitors and carbon and film resistors.
11. For more information on X, Y safety capacitors see: https://www.w6ze.org/btt/BTT050.pdf
12. One source for X, Y Safety capacitors is Just Radio. See note 10 for URL.
13. https://groups.io/g/heathkit
14. https://groups.io/g/Heathkit-Radios,

Notes for HotM #117 (HX-11) 6/2023