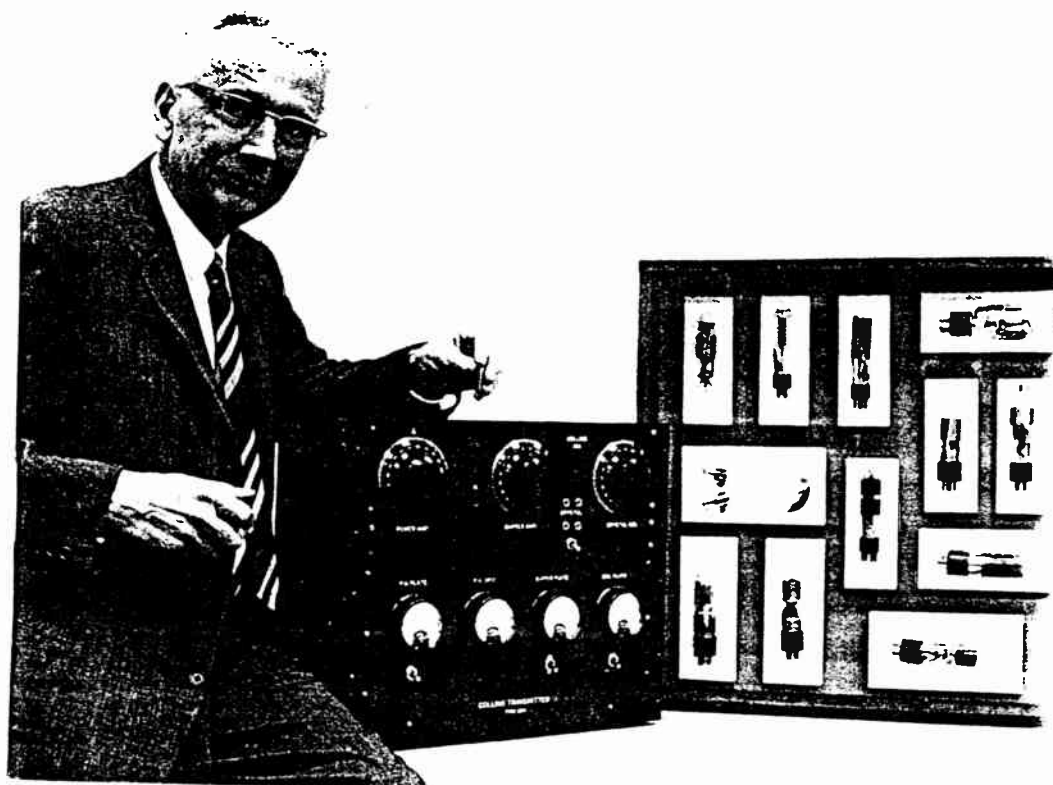


THE COLLINS
GUIDEBOOK
AND
NOTES



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"The real thrill in amateur work comes not from talking to stations in distant lands, not from receiving multitudes of QSL cards from all the world - although these are things to stir the imagination - but from knowing that by careful and painstaking work and by diligent and systematic study, you have been able to accomplish some feat or establish some fact that is a new step toward more perfect communication."

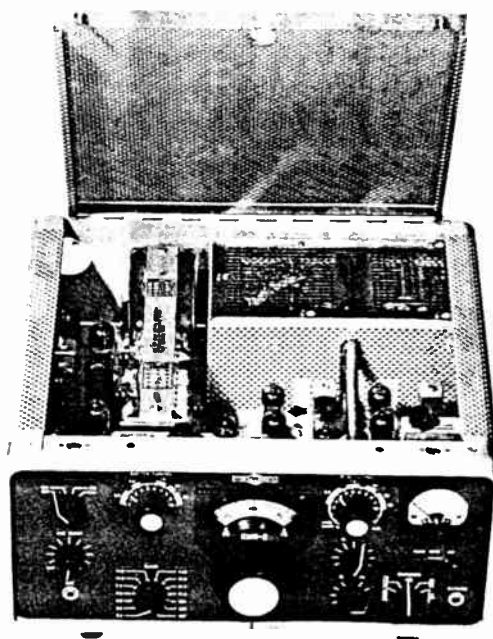
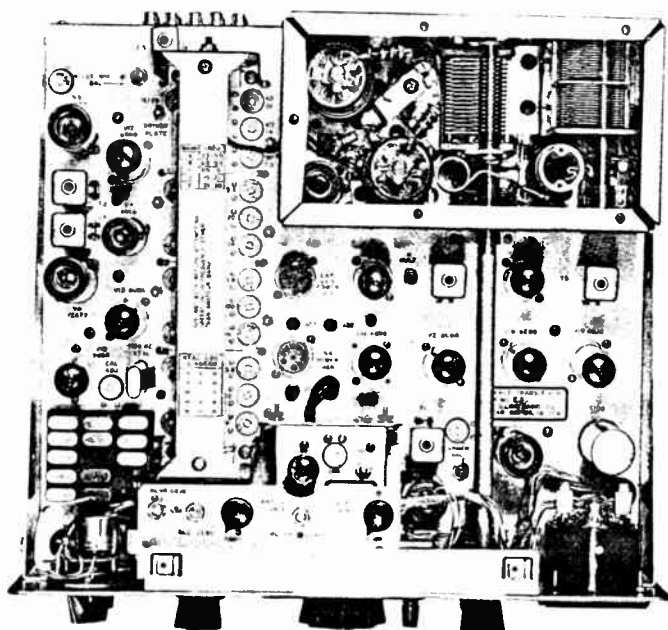
ART COLLINS, 1926
Radio Age Magazine

TIPS ON SEARCHING FOR EQUIPMENT

I trust you have recovered from the Holiday Season and now look forward to a new year for finding those elusive radios for your collection. I imagine we can all but forget about the bargain prices that classic radios used to sell for. Unfortunately those days may be over; yet, some of you out there do uncover a terrific deal now and then. I still contend that many bargains wait to be snatched up if we just be patient and keep our ears open. Sometimes we must just put the question out there that we are looking for older radio gear to see if we get any kind of nibble. Networking as it is called now does work. Don't laugh or grin at that guy with a sign on his back at a hamfest - he may be the one who found a Viking 500 in someone's attic.

Have you ever thought about going through your QSL cards from the 50's and 60's to see if the gear listed might be still around? You may have to refer to a recent CALLBOOK to see if the guy is still current. Drop him a postcard/QSL card to see if he still owns the equipment.

Another opportunity to explore rather discretely is to check the "Silent Key" column in QST each month. Because this column is rather dated, I don't think you would be offending the next of kin if you inquired about any older gear that the deceased may have owned. In some instances, you may be quite useful to the next of kin in disposing of a ham's estate.



Top View of KW-M2 Transceiver

CONFESSIONS OF A "GARBAGE PICKER!"
by Peter Cavalla, N2SPJ

As a pre-teen I got bit by the Ham bug quite hard. Money was scarce so I resorted to dismantling radios and TVs that were rescued from garbage cans for my parts. Quickly, I got the knack of spotting a radio in a garbage can 100 yards down the block.

I would rescue these discarded carcasses, cart them home and sneak them into the house and down the basement before Mom could spot me. She did not understand how such "junk" could be so rare and that a radio with push-pull output and a really good Hi-Fi output transformer was an absolute gem. This early training as a garbage picker remained with me throughout my adult life, an invaluable skills that one does not acquire in graduate school.

In 1922, some 40 years later, I was returning home from a 6:00 A.M. Mass on Father's Day when I spotted it. Through the mist of that rainy morning, my experienced eye caught the flash of something black and large as I drove by. My muscles tightened on the steering wheel as I slowed to a stop. A flashback to an earlier time alerted me to the possibility that the object was some kind of communication receiver. Should I stop in the rain and fog to check it out? So I made a careful U-turn to take a closer look. Would my intuition fail me - I thought not.

I got out and pulled the heavy slick object from the garbage can. As if waiting for some heroine, I swear it smiled at me from that big wide dial. The front panel had an emblem which said "Collins." The model number was unmistakably a 75A4!

I could hardly believe my eyes. I opened the top cover and peered into an aluminum crevasse of cans and glass tubes. I did not want it to get any wetter so into the car it went right on my light tan car seats. I looked for any other goodies that may be hanging on for dear life and found what looked like a passive audio filter. No manual or other extraneous parts were to be found. By this time, I was soaked. I thought it best, since my wife would not be up so early on Sunday morning that I not ring the door bell for assistance, but rather to take my treasure in through the back door. I wanted to share my excitement with my wife but I knew she might not share my enthusiasm, especially in my seeing me in my new wet crumpled suit. I was dying to power up this new find, but since I was

not running late and the receiver was still damp, I thought best to wait. That night the 75A-4 seemed dry enough on the outside. The receiver cleaned up beautifully.

I plugged it into a Variac and set it to about 25 volts - good engineering practice I thought. I turned the 75A-4 on and no fuses blew. At that moment, my wife "rang the dinner bell" to call me for dinner so I let the receiver cook, hopefully the receiver would not be clouded in transformer smoke when I returned.

After dinner I was at it again. The transformer was just warm. That meant at least the primary was good. I wanted to try it at full voltage but I would have to wait. After all, I had been waiting for 40 years for a find like this, what was another wait day.

Next morning, another check with limited voltage and all was well. The day at the office seemed to go so slowly. All that day I could think about nothing but that A-4. Finally quitting time came and I could return to my 75A-4, wife and children - in that order.

I plugged in a set of headphones and listened tentatively, watching all the while for any hint of smoke or sparks as I increased the A.C. voltage from 50 volts to 60 and so on. At 90 volts, I began to hear a buzz in the earphones. I stopped at that point and let the receiver warm up some more.

I connected the antenna and tuned around. I could hear something on some bands. It works!! Well all most! After some switch cleaning, two capacitors and one new tube the A-4 was working like a new one.

This fine receiver rekindled my interest in ham radio. I listened to W1AW on 80 meters for code practice and with the help of PARC (Poughkeepsie Amateur Radio Club) I got my license. So to all of you garbage pickers, don't despair. You never know when you will find a real treasure. (Editor's note: One wonders why would anyone discard a

75A-4. Was this the aftermath of a wife's ultimatum: "Either That receiver goes or I go home to my Mother!" AND NOW ON TO ANOTHER SHARED MOMENT FROM ANOTHER COLLECTOR IN NEW MEXICO.

"WHO WOULD HAVE EVER THOUGHT"

by

Richard Peterson

Richard, WB5NEN, has a proven method for collecting Collins and other classic radios that should be of interest to those out there who say "there's no more 'gold' in them there hills!" or as someone said, "Yes, there are still old vintage Corvettes in barns and maybe a Collins radio, too, under a hay stack!"

Richard writes, "Like you say, there's a lot of collectable stuff lurking in people's closets and storage building, waiting to be found - even here in remote Silver City."

"A while back, while at a lawn part, a woman overheard me say that I collected old radios. She apologized and said I probably wouldn't want her items because they were "ham radios." Turns out she had her father's estate in storage, but nobody wanted it."

"I looked at it and for \$100 I got a B&W transmitter in excellent condition, with manual; National NC-240D receiver with speaker, good condition, with manual; a tube caddy with 100+ unused tubes; CDE rotator; Eico GDO; Eico 5" scope; Instructograph with tapes; books; etc. All of it works"

"That gave me an idea, so I ran the attached newspaper ad just for the heck of it. Best thing I ever did."

"Most persons had junk, but two callers had goodies: A couple of retirees (coincidentally living on the same street in the same subdivision) each had a Collins 51J4 with all three mechanical filters. One was rack mount, but it had the hard-to-find Collins St. James Grey speaker (near perfect), and the manual; the other 51J4 had the St. James Grey enclosure (needs touch-up paint), some mouse droppings, but no speaker. Both work. Both are in good condition (one hardly needs alignment!) They'll clean up beautifully."

"I paid \$100 for each. Total outlay was \$200, plus \$3.57 for the ad." Not bad, if I do say so myself." (Editor: "What an understatement!")

Here is the ad that Dick placed in his local newspaper that one can use as a sample: "WANTED - Collector is looking to buy old Amateur Radio transmitters and receivers manufactured by Collins, Johnson, Hammarlund, National, Heathkit, others. Most manufactured before 1960. Call if you have any of this equipment. (I am not interested in 23 or 40 channel CB radios). . . . (your name, address, phone number)."

(Editor: "Good luck, Dick in your search for vintage equipment; however, I don't want to see your ad in my local paper - can't stand the competition

BUYING EQUIPMENT

I get a lot of inquiries - and I am sure you do to - about the price of classic radio equipment. Without going out on a limb, I would have to state that the asking price of a radio is largely determined by how original the radio is. In buying used equipment, especially, if you intend to keep it for resale later, several points should be kept in mind. First, how "original" is the radio? Any electrical modifications to the set from an article that may have appeared in QST or CQ although it may have made improvement to the radio's performance has to the collector destroyed any claim to its originality.

In the 60's and 70's many hams retrofitted their AM receivers with product detectors, hang AGC circuitry, etc. to receive SSB. Some of these sets can be restored back to their original state but unfortunately there is no way to "plug up" an empty hole where a tube had been added! Therefore, an original set is going to be worth more than one that has been modified, in my opinion.

Now here is where I really take the "plunge"! Because many callers ask me what should I pay for a Collins radio, I have put together a representative listing of the early Collins radios for ready reference and what has been the "average" asking prices for these sets from listings on the air and in print. Keep in mind that in later years of production, the prices of the S-Line sets did escalate tremendously. You can add or subtract to these used prices depending on originality and condition. Also, if the set has a speaker, perhaps, add \$75 and with additional mechanical filters add another \$100 or so. I hope that I don't start a "brushfire" of controversy; however, it may assist some of the newcomers just starting out to collect Collins gear.

WHAT WAS THE TYPICAL PURCHASE PRICE OF A COLLINS RADIO, THEN AND NOW (1994)?

<u>USED</u>	<u>NEW</u>
75A1 - \$375 including speaker	\$250.00
75A2 - \$440.00	\$300.00
75A3 - \$530.00	\$350.00
75A4 - \$790.00	\$500.00
32V1 - \$475.00	\$200.00
32V2 - \$575.00	\$200.00
32V3 - \$775.00	\$250.00
 310B-1 - \$190.00	 \$150.00
 310B-3 - \$215.00	 \$175.00
KWM-2 - \$1150.00 (1963-Winged)	\$400.00
30L1 - \$520.00 (winged)	\$500.00
30S-1 - \$1556.00	\$1000.00
32S-3 - \$750.00 (1963-Winged)	\$400.00
75S-1 - \$525.00 (1963-Winged)	\$350.00
75S-3 - \$680.00 (1963-Winged)	\$400.00

COLLINS "GRAY BOXES"
"WHAT DID THEY COST NEW"

MODEL	1960	1963	1966	1969	1974	1979
75S-1	\$495					
75S-2	\$575					
75S-3		\$680				
75S-3A		\$750				
75S-3B			\$658	\$795		
75S-3C			\$728	\$850	\$1200	\$3390
32S-1	\$666					
32S-2	\$746					
32S-3		\$750		\$865		
32S-3A				\$1065	\$1440	\$3673
KWM-2	\$1095	\$1150	\$1150	\$1150		
KWM-2A	\$1175	\$1250	\$1250	\$1250	\$1760	\$3992
30L-1		\$520	\$520	\$520	\$767	
30S-1	\$1556	\$1556	\$1795	\$2200	\$3467	
51S-1			\$1828			
62S-1			\$895			
KWM380						\$2995

Source: Collins Sales Literature.

Note: In 1985, Amateur Electronic Supply in their sales catalog listed a KWM-380, serial number 2208, priced at \$6495 and serial number 2259, priced at \$6995.

COLLINS "BLACK BOXES"
"WHAT DID THEY COST
NEW"

MODEL	YEAR	PRICE
75A	1946	\$375
75A-1	1948	\$375
75A-2	1950	\$440
75A-3	1953	\$530
75A4	1957	\$740
32V	1947	\$475
32V-1	1948	\$475
32V-2	1949	\$575
32V-3	1953	\$775
KWS-1	1957	\$1355
KWM-1	1956	\$820
310B-1	1948	\$190
310B-3	1948	\$215

Source: Collins Sales Literature

"DESCRIBING YOUR EQUIPMENT FOR SALE"

We want to remind our subscribers to be fair and honest in describing the quality and condition of their equipment. Because evaluation of equipment tends to be highly subjective, the seller may have a tendency to be too generous when describing the condition of his equipment. The following guidelines or standards may be applied when selling equipment. Hopefully, these descriptors will provide you with some guide to follow in future negotiations.

In the opinion of many classic radio collectors the term "mint" refers to a piece of equipment – like a newly minted coin that is brand-new – that is, has never been used. I am thinking here of someone who just turned on the equipment to see if it worked. Restoring a piece of equipment back to original should never be reassigned this designation. Mint equipment deserves special recognition – one of a kind – a museum piece if you will. What comes closer to mint would be someone who has just purchased a new radio and did not wish to keep it – "having low, low hours and little handling." Not too many pieces of gear fit into this category; yet the term has become somewhat like a cliché anymore when describing equipment that really deserves a "notch" lower in classification.

Near mint or "like new" refers to a piece of equipment that is free of obvious surface paint nicks or scratches; shiny chassis and cabinet; few hours of operation; cannot be told from new from a distance. A very representative piece deserving of being in a collection. This is the type of equipment that most of us have in our collections.

The term "very good" signifies that the equipment meets factory specifications; needs no maintenance or repair; can be immediately plugged in and operated. Some signs of minimal wear but no major scratches or dents.

"Good" equipment has no missing parts or extensive modifications that would seriously detract from its performance or appearance. Overall, this classification would be assigned to equipment that has been in use for some years and shows obvious signs of wear.

Equipment that is in "fair" condition may not be in working condition. The owner has no interest in restoring the equipment and in most instances has "stored" it in his basement or shed. One may even consider cannibalizing such gear for parts.

"Poor" equipment is synonymous with beat up, junk, or scrap. What one ham described as gear that you wouldn't take if it were free. Well-scratched, dented, rusted, or seriously abused. Should have seen the scrap heap years ago. Strictly, a parts rig; one that never should be plugged in unless you like surprises!

MY THOUGHTS ON RESTORATION

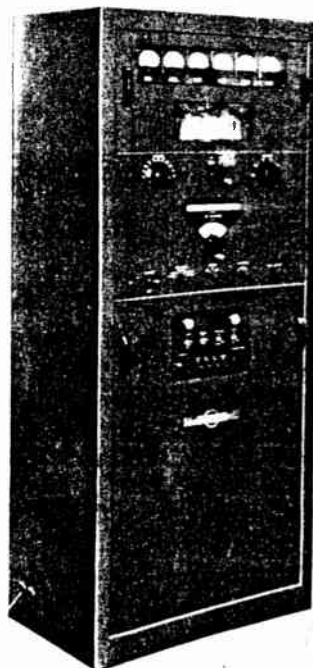
by
KODEW, BILL WHEELER

The term, "restoration" has scattered meaning to different people that are keeping old radios on the air. I have been restoring Collins equipment for about twenty five years and have cleaned up a lot of so called restored equipment during this time. To some Saturday morning technicians getting a radio just to "play" is their idea of restoration, or just getting the painted cabinet close is acceptable.

Do you cut the old resistor leads and replace by tack soldering the new one or do you completely remove the old one and replace it by wrapping the new leads like the ladies did forty years ago in Iowa? Sure it takes more time and effort but you are restoring a radio, not just making it play!

But, "Bill," you say, it is so hard to find the old original parts and Radio Shack is so handy! Yes, this is true, but you are not working on just any radio - you are involved with keeping part of amateur history alive! Isn't that worth taking the extra effort?

Take the extra time to find the correct part, and when you are done with the repair, no one should find where the repair was done. If the cabinet is in need of repair, do it properly, with the correct color. The end result will be a radio that has lasted and served for thirty years and should last and serve for another thirty.



KW-1
Transmitter

A GLIMPSE INTO THE WORLD OF COLLINS RADIO
BY DENNIS DAY, WJEC

Topic: S-Line Production - "I really never paid much attention to production quantities or serial numbers. I can tell you that for each "production run" there was an "MJO," (Manufacturing Job Order) which was a formal one page (I believe) document which specified the quantity to be built, time frame, etc. We would receive a copy of these in Engineering and "bid" the production engineering collateral. In turn, we had an "EJO" (Engineering Job Order) or an "EP" (Engineering Project) as I recall, set up to change our engineering effort to."

Topic: S-Line Serial Numbers - "Regarding serial numbers - remember during the KWM-2 days our dealers had to deal with customers who wanted the units with the absolutely latest serial numbers. The HAMS would discuss this on-the-air, so they knew in general what serial no's were "old stock" and versus newer ones. That's when the Amateur Product Line Manager asked us to start scrambling the numbers. And, that's when we went to the nameplate decal to allow production control to do this." (Comment by editor: According to one story - When Bob Henry of Henry Radio on the West Coast complained to Art Collins about having old stock radios that were hard to sell, Art ordered to have the numbers scrambled).

Topic: S-Line Front Panels - "Yes, the story of Art Collins wanting a "camera like look" (his Leica) is correct. The mechanical engineer took Art's camera to our in-house photo lab and photographed an area of it and did a step-and-repeat until they had the size of our panel. Collins had a "fab-shop" which could and did make anything! We made all our sheet metal, etc. in those days including the chemically etched panels and PA cage covers, etc.?"

Topic: S-Line Escalating Prices-Late Production - "The price went "sky high" when production quantities became very low. Set-up and other labor costs are prohibitive for small quantity production."

Topic: The 30L1 Linear - "The 30L1 Linear Amplifier (as recalled by Gene Senti and Arlo Meyer): Gene Senti had an idea for a compact desk-top amplifier using four 811 in parallel. One weekend he bread-boarded an output network and the four 811's on an old chassis and brought it into work. A Collins HAM mechanical engineer, and good friend of Gene's, Arlo Meyer (WOLBK), saw the breadboard and believed he could package it in an S-Line cabinet. They decided to make two amplifiers for themselves, as home projects. Gene would do the electrical design and Arlo the mechanical. Gene procured two sets of electrical parts and Arlo laid out the chassis, made drawings and spent some evenings in the engineering lab metal shop cutting out and bending up two sets of sheet metal parts. They assembled the two models in S-Line cabinets at home and put them on-the-air with their S-Lines. Gene brought his PA into work to show his boss, Ernie Pappenfus. Ernie was impressed and in turn showed it to Bob Cox, Division Director, and then to Art Collins. Art said "build it", so a "green room" (crash effort with few people involved in a small green room) was set up. Gene became the project engineer, Fred Johnson was in charge of making production drawings, Leo Arthurs procured all parts and Harold Downing (WA0HQG) was the lab technician that built the engineering model. This team had top priority for their project, worked long hours in the "green room," and were supported by many others outside the "green room." In about one week, the first 30L1 engineering model was operating and within a few months production of the 30L1 began. Gene and Arlo both sold their home-brew PA's and bought production 30L1.s

Several of us who had KWM-2's in our cars installed these systems for evaluation. I had on my 1960 Plymouth - on a rear bumper mount. They had to be used without a spring because of their mass and therefore wind resistance. This, however, contributed to their continued mechanical failure. Electrically, the units worked quite well and I used mine for a couple of years, I believe. The decision was made to drop the project and I don't know what ever happened to the units. I also don't know if any photographs of the units exit.

And now to the story about Prose. I recalled that A. Prose Walker had succeeded Warrne Bruene as our department manager. He would stop to visit with Jerry Vonderheide, (Project engineer on the 32S-3/3A) and I many times regarding the new radios. When we finished the engineering models (one each 75S-3 and 32S-3) Prose took them home to check-out. Prose is a "CW" man's CW man." Receiver selectivity, BFO tuning, transmitter CW keying waveshape and CW spotting were all critically assessed. I was never much of a CW operator and Prose would always rib me about this. My standard retort was "If God would have wanted me to talk with my fist he wouldn't have give me a mouth." With that, Prose would laugh and go on. By the way, God knows, Prose knows, and I know what his first initial "A" stand for ---but do you know? It was a big secret at Collins. I believe Prose still has the 32S-3 engineering model. I don't remember what happened to the 75S-3 engineering model.

In this second part of a continuing series begun last month, Dennis Day, former Director of Engineering at Collins Telecommunications Products Division, explains why Collins chose to use the 811 tube in the 30L1 and elaborates on the development of a tuned mobile antenna system for the KWM-2 transceiver. He also relates an interesting story about A. Prose Walker, former ARRL President and a department manager at Collins Radio.

Collins typically used Eimac tubes in power amplifiers, and when Bill Eitel of Eimac discovered Collins had 811's in the 30L1, he really got upset. He was told that if he could produce a tube having performance equal to a pair of 811's, Collins would try a pair in the 30L1." Bill said he would do it and later delivered a pair of zero-bias triodes for trial. Their inherent distortion characteristic was not good enough and because of production schedules, Collins went into production using the 811-A's. Eimac later fixed the distortion in their tubes, which became the 3-400Z family.

Next, Dennis describes the development of an automatically tuned mobile antenna for the KWM-2. Quoting Dennis: I'm not sure how this project came about, but the General Electronic Controls, Inc. Company of Minneapolis, Minnesota was involved. They designed and produced, I believe, five HF automatically tuned mobile antenna systems for use with the KWM-2. I have copies of their schematics, the "Model 20A Automatic Coupler" and the "Model 21A Coupler Control Unit." Their release date to Collins is shown as October 6, 1960. The system consisted of a small control unit which had a 12 VDC power switch, a bandswitch and VSWR bridge. It was designed to fit under the vehicle's dash. The octal plug on the back of the KWM-2 provided the band information directly, so the control unit bandswitch wasn't used. The SWR bridge showed the state of tune, of course.

The antenna/coupler consisted of a base canister about four inches in diameter and six inches tall, as I remember. It had a stepper motor for bandswitching shunt loading capacitors, a tapped base loading coil and the center loading coil. Also, a discriminator and servo driven roller coil provided the tuning. There was a hollow three foot base rod, another canister about the same size as the base one for the center loading coil, and a five foot top rod. The center loading coil was a large high "Q" coil for 40 and 80 meters. It was switched by a shaft coming up through the hollow base rod.

In this third part of a continuing series, Dennis Day, former Director of Engineering at Collins Telecommunications Product Division, recalls development of the KWM-5000 transceiver. "While I was doing production collateral, Gene Senti, Ed Andrade, and others were at work on the KWM-5000. This transceiver was first referred to as part of "A Prestige Line of Amateur Equipment," by Gene. Later it got its KWM-5000 name but was also referred to as the "Cadillac" and the "Gold Plated Special." One engineering model was built. It was only partially debugged before the project was terminated by Art Collins. Some day, I hope to finish the debugging and put it on the air. (Dennis owns #1 - ed.)

According to design plans for a Prestige Line of Amateur Equipment with drawings dated May 10, 1960, by Gene Senti, Dennis indicated that the program objective was stated as follows: "To develop a completely integrated amateur station. Quality and advanced state of the art are the prime considerations, with price and build quality of secondary concern."

The technical plan was "a transceiver employing two selectable VFO's which would allow transceiver operation with either VFO, or fully separated operation of the transmitter and receiver within any 1 MC range. The receiver/exciter circuits were built into a table top cabinet. The linear amplifier and driver were automatically tuned and could be installed up to several hundred feet from the operating position. It was proposed to build in those items which have been supplied as accessories in the past such features as an RF wattmeter, phone patch, Conelrad Monitor, Q-Multiplier, 10-minute time, clock, etc. Styling would be similar in appearance to the S-Line but will of necessity be larger and may approach the appearance of our broadcast console.

The frequency range was 3 to 30 Mhz in 1 Mhz bands. RF output of the exciter was 0.25 watt. The PA was to use the Eimac 4CX1000 tube.

An official engineering project number (EP 39-1894) had been assigned and funding authorized to proceed with design and development. The plan objective was similar to the previous one except for the inclusion of a 32S-1 PA in the transceiver package. The expectation was to do the automatically tuned remote linear later.

Early 1961 equipment specifications for the transceiver (175 watt amateur type) would be housed in an S-Line style cabinet 8-1/2 inches high, 20 inches wide, and 15-3/4 inches deep. It would weigh 50 pounds. Operating specifications would be similar to or better than the 75S-1 and 32S-1. The unit would have 27 tubes.

Art canceled the project because he didn't feel it advanced the state-of-the-art, which it really didn't. We thought it would be an asset to the HAM-Line, however. There's a saying that goes, "the boss isn't always right, but he's always the boss!"

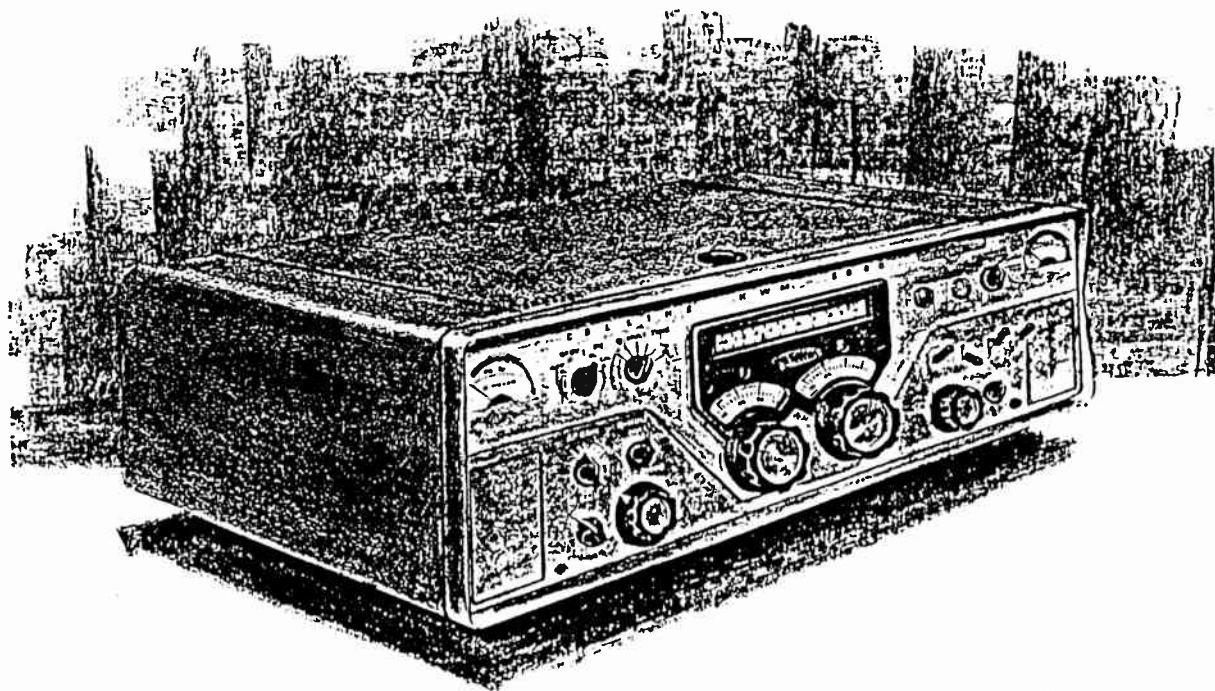
The update to the 30S-1 was the 30S-3, originally called the 30S-2. Joe Vanous was the overall project engineer and designed the RF network and control circuits. I did the solid-state dual servo design. Glen Deen (WOBWS) did the solid-state power supply designs and the output "pancake" coils. Elmer Bruce did the mechanical design, and Joe Jekerle (W0VE0) built the two models.

The 30S-3 was designed for continuous automatic tuning and loading from 2 to 30 Mhz, with 2KW PEP or 1 KW CW input, attended or unattended and local or remote control operation. It used a new Eimac ceramic instant heat triode designed for Collins. This tube was initially called a 3CX1000A7 and was later put into production by Eimac. The 30S-3 was smaller than the 30S-1, being 28 inches high, 17 inches wide, and 13-3/4 inches deep - weight 75 pounds. It would load a 3 to 1 SWR and would tune and load any 2 to 30 Mhz frequency in less than 40 seconds. Tune time across an amateur band was less than 10 seconds. The linear required less than 1-second warmup. Excitation was 20 watts or more to tune and less than 70 watts of RF drive to put out a generous kilowatt.

Dennis had this unit on the air until a few years ago. "I can tell you that it works like 'gang busters.'" Dennis indicated that it will be back on the air when he gets back on HF.

"As I recalled, Art cancelled this PA because he didn't feel it was enough of a technical advancement, even though the production drawings were near release. Art had in mind a much smaller aircraft type of PA. Joe Vanous was immediately reassigned to designing the "Transamp," a "universal" RF Translator and PA in an aircraft ATR configuration. This project was also later cancelled.

Next month Dennis talks about later developments with the S-Lines, specifically the new 32S-4 and 75S-4 units.



• FREEMAN'S JOURNAL - SPECIAL - MAY 27, 1960

THE KWM-5000

Beginning about November, 1963, I began planning a completely new amateur line. I completed design for the transmitter, receiver, and transceiver. Funding was approved to do the transceiver design and then spin-off to the receiver and transmitter. Bill McKay was assigned to proceed with the low level RF circuits while I undertook the power amplifier and power supply.

The tuning range was continuous coverage 1.8 through 30 Mhz., in 6 bands: 1.8-3.0, 3-5, 5-9, 15-21, and 21-30. It used a slug rack for slug tuned coils and switched capacitors, ala our previous equipment. (What a delight to 160 meter fans to have a Collins set that worked 160! - editor)

The transceiver was completely solid-state except for the single Amperex 8300 dual tetrode in the PA. Operating in parallel, at 1250 VDC on the plates, the power output was 100 watts PEP. The 8300 is an instant heat tube and therefore the transceiver had less than 1 second warm-up. The power supply was a switching power supply which operated off 12 VDC or 115/230 VAC.

We managed to finish these circuit designs, breadboarding and test before the project was cancelled. I believe the primary reasons for cancelling were lack of receiver front-end performance and other hot projects. Joe Vanous and I were assigned to do the B-58 Hustler HF Transceiver retrofit at that time. (Dennis' reference is to the B-58 airplane. ed.)

All I have left of the project are photos of the artist rendering of an early version with slightly bowed-out sides, the last model and the complete new line, and the balsa model. Also, I have a partial schematic for the transceiver and the PA parts.

In closing, Dennis recalled that in "winding down the decade from late 1968 and through 1971, the economy took a major dive." This is the period when Loney Duncan transferred to Dallas, Jack Crosgrove was promoted to our Division Director, and Jim King was promoted to our Department Head. I was given parts of several groups, including Gene's (Senti) after he retired. "It was a very difficult period and we lost over half of our workforce."

Dennis also had some passing thoughts about his "old" boss, Art Collins (W0XX). Incidentally, Art was born in 1910 and died on February 25, 1987, at the age of 77. "Art must have done most things 'right' or he couldn't have built the company he did. He possessed technical vision and ideas "extraordinaire" and caused them to be executed with great precision."

Those in engineering regarded Art Collins as an innovator, inventor, technologist, forward thinker . . . but not a "business man," Highest technology and quality was his hallmark . . . at whatever price was necessary. This led to many innovations and inventions and world renown in the radio communications and avionics arena. However, such "business" oracles as Forbes, Business Week, and The Wall Street Journal never gave him high marks for his business acumen.

Collins engineers would be given equipment development tasks which were state-of-the-art (did the "art" come from "Art" or "Arthur"), very challenging and interesting work. In general, there was a philosophy in place which led us to design and develop equipment, with company funds, in preparation for entering a market or developing a market. Those jobs which were bid on were always of a high technology nature, and perhaps had never been accomplished before.

Dennis retired from the Collins Defense Communications Division of Rockwell International, March, 1990, after spending 34 years with the company. I speak for all the Collins enthusiasts out there in wishing him well in his retirement years. Keep in touch, Dennis.

THE NEXT PHASE
"BUCK ROGERS HATS"

Talk about your new 21st century technology! I read in the Electronics Buyers' News where Rockwell International Collins Avionics and Communications Division, Cedar Rapids, has been licensed to build more than 20,000 commercial belt mounted computer systems for industrial workers. The computer can store large numbers of engineering drawings and diagrams to be displayed on helmet or cap-mounted displays for hands-free operation by repair technicians, factory workers, and public service employees. The system uses a 0.7 inch active-matrix LCD flat panel from Kopin Corp. to project the image on the display. This marks a major diversification for Collins, a predominantly defense-oriented contractor, that had made military avionics and microwave communications systems. Times are a changing! (ed.)

THE FABULOUS KWM'S
and
SOME OF THEIR UNTOLD STORIES
by
Chuck Carney, W5PVV, ex W0GDJ
Amateur Product Line Manager
1957 to 1966

"I know it's not, but Collins equipment is perceived by the military to be a cut above it's competitors because of it's ham equipment line," the President of a Collins competitor once told Bob Cox, then President of Collins Radio Company.

I relate this because Collins' Amateur Radio Equipment has always led a dual life, amateur radio and government communications, throughout the entire life of the Collins Amateur Radio Product Line. Most amateurs are well acquainted with stories of Collins ham equipment in "hamdom," but may not be aware of its influence in the Government Services. For one thing, Collins ham equipment was often the test bed for advances in electronic circuitry for commercial and military radios, mechanical as well as electrical, and as such, we usually led the pack with technology advancements. And, in those days, for some unfathomable reason, the military found that Collins ham equipment often met requirements their designed-to-mil-spec equipment didn't, and most importantly, was available to meet emergency demands. As a result, there were some very interesting stories on their uses that should be retold; stories that are not well known outside Collins Radio.

First I should probably qualify myself by mentioning that I was the Amateur Radio Product Line Manager from 1957 to 1966 – much of the golden years. The function of the Product Line at Collins was to provide the interface between engineering, manufacturing, sales, advertising, and service repair for all Amateur Products. As such we determined the products to be manufactured, their build rates, pricing, sales networks (domestic, international, and military) and responsible for profit-and-loss. One of our toughest jobs, though, was putting out fires, for Art didn't like any aspersions cast on our equipment – none. And as we look fondly back, we sometimes forget the rough spots in those transition years (which is another story).

Most of these "tid-bit" stories are from memory and some of the detail are lost in the dark recesses of memory and are therefore short, but, collectively, you may find them interesting:

* Dag Hammarskjold, Secretary General of the United Nations, was killed in an airplane crash in the jungles of Africa in 1962, while on one of his many diplomatic missions. The crash and his demise were relayed to the outside world over a MARS suitcase KWM-2.

* When Vice President Nixon was confined to Venezuela during a coup attempt in 1958, no one in the country (including he and his group) was allowed to communicate with the outside world for several days, either commercially or through their aircraft, Air Force One, 18-miles away. However the aircraft commander, Col. Tom Collins, who had previous carried the plan's suitcase KWM-1 to their hotel (it looked like ordinary luggage), threw a wire out the hotel window and in a few minutes was talking to SAC Headquarters in Omaha, keeping President Eisenhower advised of what was going on, and of their own well being. There is a picture of Colonel Collins and his suitcase KWM-1 in the Fall, 1958, issue of *Collins Signal*.

* For a period in the 1960's all military Command Aircraft were required to carry suitcase KWM-s and the pilot was responsible for carrying the suitcase with the group any time they departed the airplane while enroute. I recall talking to King Shwayder (President of Samsonite) who had just returned from a trip with General LeMay, then Commander of the Strategic Air Command, who showed him the aircraft's KWM-2 nestled in one of Samsonite's Silhouette cases. Thousands of these suitcases were sold to government services. He was suitably impressed. The September 1962 issue of Fortune Magazine carried a Samsonite ad showing the KWM-2 in one of their suitcases, the CC-2, along with a Collins testimonial (which was highly unusual, I can't recall ever seeing a Collins authorized testimonial in another company's product advertisement).

* At one time all U.S. embassies and legations, except the largest (those with standard h.f. military communications equipment), were furnished with suitcase KWM-2's or S-Line, for emergency back-up communications.

* I vividly recall how the suitcase KWM-2 came into being. Several people had asked me "when is Collins going to build a suitcase for the KWM-2." This included the military because they had been cobbling suitcases together for both the KWM-1 and 2, for years. After talking to Ernie Pappenfus (then engineering department head), he indicated it wasn't really something engineering wanted to get involved in because of their work load. I then decided to talk to Samsonite to see if they would be interested in designing one for us.

As fate would have it they had just started a program looking into industry uses for their suitcases. They were a little reticent, at first, because it didn't look like a very large volume program in the beginning, but they wanted to get their "feet wet" in the industrial market and jumped in with both feet. After getting development and unit cost estimates, I figured 50 cases would be the minimum we could order initially, so I put in a requisition for 50 units. Bill Roodhouse, Vice President of Marketing, told me to come over and talk about it. When we talked about it he said he might authorize purchasing two (which probably would have killed it). At that moment Bob Cox, then President of Collins, walked in and in his inimitable way, asked what the conversation was about. Roody told him we were talking about a suitcase for the KWM-2. Bob immediately came to a point, "I wondered when someone was going to pick up on my idea for a suitcase for the KWM-2." Needless to say Roody signed the requisition for 50 and the Samsonite portable was born. A later modification made it possible to fit either a 32S, 75S, 30-L, 51S, or KWM-2/PM-2 in one suitcase. And, thousands were sold.

* General Stilwell (son of the WW II, China Theater, General Stilwell), who was then a paratroop commander, often jumped with a suitcase KWM-2 between his legs letting it go at about 10-feet off the ground, as did his sergeant. This was to be assured of having communications when they hit the ground. He reportedly never had an equipment failure on one of these exercises. This, of course, was backup to other military h.f. equipment dropped by independent parachutes, which often drifted too far away to be immediately available or, perhaps, not open at all and crash.

* The U-2 spy plane used a KWM-1 for its long range communications. At an AFCEA (Armed Forces Communication and Electronics Association) convention one year, I talked to a communication engineer (who, incidentally, was an avid Hallicrafters fan) who was attached to Lockheed's "skunkworks" who related the story of the KWM-1 in the U-2 (over refreshments in our hospitality suite). The military had no airborne h.f. equipment anywhere near as light as the KWM-1. When asked, someone from Collins told them that it probably wouldn't work at aircraft altitudes because of tank circuit arc-overs, due to its compact construction. Not much room in that radio. But, it apparently worked better than anything else they had. The U-2 that Gary Powers flew when he was shot down over Russia, used a KWM-1. It was located on a small shelf behind the pilot's head, and fed a tuned wire antenna that stretched from beyond the canopy to the tip of the tail. I was pledged to secrecy on this program and found out thirty years later than Gene Senti, the

engineering wizard behind the KWM-1 development, had an experience wherein he supplied some technical information to the U-2 program, and also had been pledged to secrecy. Thirty years seemed long enough for both of us.

* Once while discussing an Airforce procurement of S-Line radios, one of the group noted that they had so much trouble with units seemingly wandering off that they resorted to spraying an indelible purple dye on the front panel, chassis and cabinet for easy identification. I never heard how it worked out.

* In Vietnam, many KWM-2's were used in the field and on the run. The Tape Antenna was specifically designed for field use as a tuned antenna for this application. It was difficult to use any h.f. radio in the field without an antenna coupler or a tuned antenna. Most of the time these radios were set up and operated by non-technical personnel. We had so many requests from the military for an easy to set-up, easy to maintain all frequency antenna that we started to see what we could do. Verticals are cumbersome to carry as portables, they require a counterpoise, and can often be difficult to erect in some terrain. In these applications, medium range communication is most normal, with low-angle radiation antennas working best, which isn't the verticals best feature. So we started looking at dipoles.

In the brainstorming it was envisioned that if we had two 50-foot tape measures placed back-to-back, with a locking device, and calibrated in frequency instead of feet and inches, it might fill the bill. Because our antenna engineers didn't often get involved with amateur radio applications and their heavy work load at the time, we were given some tips and asked to find another way to get it done. We went to Hy-Gain and asked if they could do it on a hurry-up basis, which they agreed to. We gave it the model number TD-1 and sold a lot more of them than I had envisioned, predominantly to the military. We later discovered there was a flaw in its design which we hadn't anticipated. The tapes were made of stainless steel and as such were quite reflective in the sun light, which often drew sniper fire. One tech told me the way he solved this was to set the antenna to frequency, and then dip the tapes in a gallon of army s---t brindle brown paint. Otherwise they worked great. A few years later Collins developed a wire model with a lot more class, obliterating the above problem.

* We received a newspaper clipping (from some Army newspaper), describing the introduction of h.f. communications for long haul and medium haul service in Viet Nam. The article was very non-committal giving no names or equipment detail, as if carefully reviewed by censors. There was, however, a handwritten notation alongside, from one of the Air Force techs: "These KWM-2A's are really getting a workout here. Many are on the air 24 hours a day in long haul nets. The rest are set up in the field from knee deep rice paddies to carried up in the mountains on strikes."

THE KWM/S-LINE
SERIAL NUMBER STORY
Charles S. Carney, W5PVV
Amateur Product Manager
1957-1966

Collins, as a policy, made continuing circuit improvements on production line radios, as production progressed. Most of these were incidental like changing the value of a resistor, or adding a capacitor, or some other component that made an operational or manufacturing improvement.

Some of these changes were the result of field complaints. Another more irritating situation that sometimes arose was when a given production test could no longer be met. Usually this was due to one or more component values varying, but still remaining within their specification tolerance. This can happen when new component shipments are received, or when vendor changes are made. Most of the time this has little or no effect on performance. However, there is always the time when cumulatively, these drifts all change in the wrong direction, and manufacturing is tearing its hair out with: "hey, we lost the recipe."

Engineering is then called in to figure out why. The culprits are ferreted out and the necessary circuit changes are made. These problems are innocent enough, and just a fact of life. However, rarely does the Instruction Book reflect these changes except perhaps every year or two.

Now, when hams come to find out their equipment does not conform to the schematic in their instruction book, they want to know why. Or, when one ham thinks that his friend's equipment works better than his and it is explained: "oh, there's a mod out on that," they get very restless. Then, when he decides to buy a new rig he remembers that the latest production units have the latest mods and therefore are the best, at least in his mind. So, he shops all the ham stores and catalog houses.

The second subject he want to discuss is serial numbers. This drove our dealers up the wall. Some even wanted to ship their *older* new units back to have all the mods put in and fitted with *new serial numbers*. This drove us up the wall! There was a gradual awareness in hamdom that this was happening with the 75A4/KWS-1 series, but the problem compounded with the KWM-2 and the S-Line for they were much larger production runs, and new radios with new engineering concepts.

Added to this was another name-plate problem we were becoming aware of. Nameplates historically were placed where they could be easily viewed. On most ham equipment this was on the back of the cabinet, or even on the front. When the KWM and the S-Line were put into production it was a reflex action to put the name-plate/serial number on the back of the cabinet. However, on these radios, the cabinet could be very easily removed and we came to realize we were just "serializing cabinets" - not radios.

I finally prevailed on Ernie Pappenfus (then had of ham engineering) that we had a "fire" that needed putting out. So, we scrambled serial numbers and put them on the radio chassis. But, fixing one problem always generates another. The serial numbers never went on a radio until it had finished final test (in case it never made it), and permanently affixing metal name tags to a finished chassis posed some problems for manufacturing. Besides, it was difficult to scramble a pile of metal name plates. So that was solved by going to a decal type of serial numbered name-plate. Plastic name plates raised a few eye-brows at first, but in the end seemed to placate all concerned.

TROUBLESHOOTING THE
KWM-2 TRANSCEIVER
by
Your Editor, W3BJZ

Over a period of some 15 years beginning in 1960, Collins Radio introduced four different KWM-2 models identified not by any sequential numerical designation to indicate the end of one production year and the beginning of another new model. Rather, model "years" became identified by their emblem insignia, for example, whether the unit carried a "winged" - "round" - "no emblem" - or "Rockwell-Collins" name tag just above the dial escutcheon.

Through these years Collins issued, to the best of my knowledge, ten (10) factory service bulletins from 1960 through 1974. Thirty-nine circuitry changes were annotated in the Collins 2Instruction Book, 9th edition, 15 January 1978. Although most of these changes were to improve performance, some engineered to improve the reliability of the radio.

The two most obvious changes came when Collins replaced the two open frame relays, K2 and K4, with new plug-in units for easy replacement in the field. Then they added an extra crystal board for extended frequency coverage for military applications. With this latter modification, the KWM-2 acquired the new designation "KWM-2A."

Obviously, many amateurs updated their KWM-2's using the information contained in the "service bulletins" that Collins released. Other tips or recommended changes to improve performance appeared in many of the more popular amateur radio periodicals during the 60's and 70's. Understandably, the possibility of owning an unmodified KWM-2 as it came from the factory in Cedar Rapids is rather remote but a nice find.

Forewarning

Before you precede to "unbox" your KWM-2, I need to call your attention to the hazards of servicing any tube-type radio that requires high voltage. When the KWM-2 is turned on, the set is "alive" with voltages that can be lethal: 110/120 A.C., + or - 800 volts D.C. and + or - 300 volts. With the set off, there is still 110 volts present. This is not a solid-state set that you can poke around in without much consequence once you take it out of its cabinet.

One side of the 110/120 A.C. line current is present in the radio even when the set is turned off since one side of the A.C. line is carried to the radio through the 11-pin "Power Plug" on the rear apron and appears on Relay K4 and Switch S11 (on the function switch). However S11 normally has a protective cap over this switch. This is the one that is located just in back of the Function Switch in the upper left hand corner of the front panel.

In the case of the newer plug-in type relay, this problem is not as dangerous since the relay contacts are protected by the plastic cover - except of course the solder terminals which should be covered with insulation.

The chances of getting shocked is much more likely if relay K4 is the "older style" open frame type relay. From the underside of the chassis the relay wipers on terminals 11 and 12 are fully exposed. Without getting into the polarity question of whether the terminals/wiper are at ground potential, this potentially dangerous situation should be recognized and avoided. Note that the standard power supply plug is not a polarized type.

Thus, be sure to disconnect the KWM-2 from the power supply if you are contemplating any service to the radio. However, this is not always possible especially when realigning the set from underneath or doing troubleshooting. Exercise caution when working around potentially hazardous voltages. The transition back to tube-type equipment for some hams who for the past 10 or more years have been operating solid-state equipment deserves this forewarning.

Prerequisites

Initially, I would suggest having the following basic service equipment, commonly found in most ham shacks. No doubt some of you may need to locate some of these items either by loan or new acquisitions.

1) A set of splined or bristol wrenches preferable with a detachable handle. Try to purchase a set of Xcelite No 99PS-60 manufactured by Cooper Tools. Contact your local industrial tool or hardware supplier. All set screws used in the KWM-2 are of the splined type. A set of "L-bent" splined wrenches can be substituted but they are rather cumbersome.

2) Any standard volt-ohm meter or vacuum tube volt meter, ideally, with an R.F. probe.

3) A relatively inexpensive frequency counter to read the output of the BFO oscillator, the HF oscillator, and the variable frequency oscillator. Try borrowing this item rather than making a first-time purchase if need be.

4) An R.F. frequency generator.

5) A slug tool to perform adjustments to a number of slug-tuned coils.

6) A 50 ohm dummy load, 100 watt.

7) Relay contact burnishing tool (Number 600 Wet/Dry Emery Paper purchased from a local automotive paint store may be substituted)

8) An assortment of standard shop tools normally found in most ham shacks.

Removing the KWM-2 from its cabinet

Before removing any parts from your radio, it is highly advisable that you have a container such as a coffee can with lid to store any parts that you remove from the M-2. Do not lay screws etc on your workbench and hope that they will be there when you return to reassembly. I cannot list all the times that I have had to go on my hands and knees to search for that elusive screw or washer that fell inopportunely off the workbench.

Now comes the "unboxing" as I call it. Lift the lid and remove the two Phillip head screws on the front trim ring - these are just under the front lip of the lid.

Next, place a bath towel on your lap and position the radio, face down with the legs tilted from you. Remove the front legs, the back legs, and, then, the rear center screw. Hold onto the radio as you carefully slide the cabinet with one hand away from the radio - a helper could be useful at this point. Be careful not to handle or move any of the under chassis components in the process. Did you ever see such a maze of wires and components in your life!

The "Heart" of the KWM-2

The slug-tuned R.F. circuits that are mechanically tuned using the slug tuned rack is unquestionably at the "heart" of the KWM-2. Normally, the first inclination when a "problem" arises is to realign the slug-rack through a slight tweaking or readjustment of both the ferrite cores in conjunction with the 19 ceramic capacitors that "dot" the underside of the slug rack. It should be noted that four (4) other ceramic trimmers are typically used elsewhere in the circuitry. Under normal service procedures using the steps covered in the Collins service manual generally corrects any low grid drive on certain bands or poor performance of the receiver as noted in the S-Meter position.

However, life is not always that simple! Sometimes there is component failure, especially with the ceramic trimmers themselves. The ferrite cores which slide into five (5) coil forms rarely go bad unless the thin "wire" from the brass adjustment screw to the ferrite core breaks. Epoxy cement fixes this problem if a replacement cannot be found.

Over time, the 19 ceramic trimmers have an affinity for collecting foreign deposits or other residue that can result in erratic readings during realignment. Using the grid position of the meter as an indicator under transmit or the 100 Khz. calibrator marker under receive alignment, one should see two distinguishable peaks from each trimmer. If the trimmer adjustment appears sluggish or nonexistent, the remedy is not to replace the suspected ceramic trimmer defective trimmer instead it may be the trimmer needs cleaning.

These trimmers have essentially two surfaces that are coated with a silver material. When taken apart, in some instances, this material has spread to the entire surface through the wiping action of the top half. Rather than "shooting" a mist of contract cleaner on the trimmer itself, the trimmer should be removed. And, just when you thought it would be easy! Now that you have time to inspect the M-2 in the "raw." lay the M-2 on its side preferably with the knobs to your right. Find the non-metallic rod that runs through the four aluminum switch enclosure cans to the bandswitch knob. Rotate the bandswitch to expose the two set screws and back out the screws about one turn using your spline tool.

Grab the front portion of the rod with a small pair of pliers just where it fits into the hub containing the set screws. Now carefully slide this rod to the rear exit hole with any lateral movement so as to not disturb the various wafer switches that the rod moves. The rod should slide very easily as it disengages from each wafer section. Use a screwdriver on the front of the rod as you attempt to grab the rear of the rod as it protrudes from the rear exit hole.

Lay the M-2 down in its normal resting position. Next, remove that aluminum shield enclosure that covers that ceramic trimmer that is causing you the problem by removing the two stud nuts from the top side of the chassis. It may be more than one enclosure that you will have to remove.

Place the M-2 on its side again. Pop the can off to expose the underside of the coils and ceramic trimmers. On the underside of the suspected ceramic trimmer, you will see a soldering lug that slips into the holding pin that joins the two halves together. Carefully slip the soldering lug back from the pin using small pliers gripped to the soldering terminal. The top half (from the top of the chassis) should "pop" off with a nudge on the pin using a toothpick, for example. Notice that the ceramic has a thin layer of silver on one portion. There is a thin rubber cushion that can be removed from the bottom section. Use lacquer thinner (K-Mart or Wal-Mart) on both sides to remove any of the metallic residue or foreign matter. Reattach the clip by holding the ceramic trimmer from the top side while sliding the clip back on to the pin. When replacing the enclosure, make sure you don't pinch any of the wires or cabling against the chassis and the enclosure lip.

Carefully slide the bandswitch rod through the wafer sections and tighten. If you inspect the rod, you will see the indentation that the two set screws made into the soft rod. Draw a line out from that point to get a reference mark when seating the rod into the hub. This will help you realign the rod.

Contrary to what may be a perceived as a highly critical alignment procedure is really not such a horrendous experience. Once the set screws are tightened, you can inspect how the front crystal switch makes contact as you move the bandswitch through each band. I am sure you have done it right and that the realignment can proceed normally. Good job!

Perhaps, this hands-on explanation may seem more complicated than it really is. No doubt a little old-fashioned ingenuity will suffice to get you through this step.

the 75-4 RECEIVER

Production: 7000+ from 1955-1957. Weight 35 pounds, Size 17-1/4 x 10-1/2" x 15-1/2". Last price - \$790.00.

Collins 75A-4 Receiver was designed expressly for Amateur operation on the seven HF bands - 160, 80, 40, 20, 11, and 10 meters. The Receiver retains the time-proven features of the earlier 75A Series; notably, excellent image rejection through the use of double conversion; precise dial calibration and high stability, provided by the permeability tuned, hermetically sealed Collins VFO and the crystal controlled first injection oscillator; and ideal selectivity produced by Collins Mechanical Filters in the IF strip. Later models (sometime after 3000+ serial number) had the 4:1 reduction knob and the 15 meter band went only to only 21.5 Mhz rather than 21.8 Mhz. on the earlier models. Estimated production was over 7000+ units with the last run made at the Collins plant in Canada in 1959.

The price when announced in 1955 was \$595.00. The 270G 10" speaker and cabinet assembly sold for \$20.00. The 312A-1 speaker/control sold for \$37.50. Asking price today for a 75A4 with no speaker and one mechanical filter varies, of course, but the typical price is somewhere around \$400.00 for an excellent set. The mechanical filters, 500 cycle and 6 KHz. can sell for over \$100. The 270G speaker, if you can find one!, may carry a price tag of \$100.00. Lucky, indeed, is the person who can find a 75A-4 with extra filters and a speaker for a couple of hundred dollars!

THE KWM-3 TRANSCEIVER

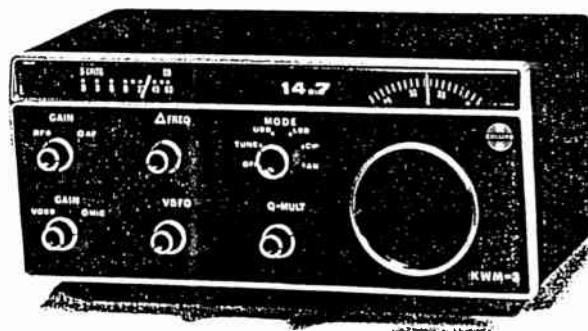
According to Dennis Day, WOECK, somewhere in 1966, part of the new Collins URG-II system line included the included a new line of commercial and amateur equipment designated URG-II-1/2. Somewhere along the way the Ham transceiver, designated the KWM-3 was conceived. According to Dennis, "this plan was not executed because we were all too busy on URG-II contracts and other projects. None of us were excited about this plan because it would have had an exorbitant price. However, the equipment would have possessed state-of-the-art performance with an automatic digital tuning tracking system." What you are seeing in this picture is the control console unit without the "main frame transceiver" that would have been connected to this console through shielded wiring harnesses.

THE KWM-1 TRANSCEIVER

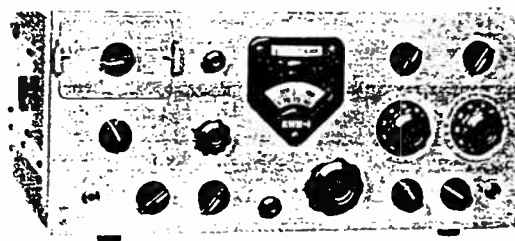
The KWM-1 transmits on upper sideband with an input of 175 wats PEP in the 14 - 30 Mhz. range. The bands are covered in 100-kc segments with a total of ten segments available. It weighed in at 15 pounds and measured 6-1/2" high x 14" wide x 10" deep. Collins supplied a 516E-1 12vdc power supply and a 516F-1 AC power supply. One could purchase a 312B-2 speaker console, a mobile mount, other crystal plug-in units that held 10 CR-18 HF oscillator crystals, and a DX conversion adapter that allowed the operator to separate transmitter and receiver functions. The actual production count of KWM-1's produced from 1957-1958 is considered quite low when compared to other Collins equipment. The unit, then, cost \$850 with power supply; today an average used KWM-1 can sell for around \$500. One interesting story about this unit is that officials accompanying Vice President Nixon to South America used the trusty KWM-1 for emergency communications to Washington using a wire draped outside his hotel room in Caracas, Venezuela.



the 75A-4 RECEIVER



THE KWM-3 TRANSCEIVER



THE KWM-1 TRANSCEIVER

TUBE REVIEW
by KØDEW, Bill Wheeler

There was a time, when new-old stock and JAN tubes became scarce causing some of us that use 811A's to be horrified at the prospect of finding suitable replacements. The reliability of some foreign manufactured power tubes were certainly something less than desirable. Some just self-destructed when high voltage was applied! It is this amateur's opinion that this condition has changed for the better.

PRIDE Tubes, located in Huntsville, Alabama, is offering RF power tubes that are tested in actual sets before the tubes are sent to the consumer. Last spring at the Dayton Hamvention, I was asked by the fellows from PRIDE if I would use a set of tubes in my Collins 30L1 and then to share my results with other Collins users. I agreed to do so with two conditions, first, they must send me four tubes from off their shelf - I did not want the ones they had brought to Dayton for "show and tell." Second, I would test and misuse the tubes any way I saw fit; they would be used as the majority of hams would use them - by operation them on the air.

During the next nine months, I gave the PRIDE tubes the toughest workout in my 30L1 that I could without deliberately attempting to destroy them. One of the operating parameters used was to tune the 30L1 at 14.175 Mhz and call the Collins Net on 14.263. I am told by DXers and contesters that this condition will sometimes exist in the "heat of battle." Another "mean" thing that I did was to cycle the ON-OFF switch on the amplifier. This was done on 75 meters because these fellows have seen and done about everything in ham radio. Only occasionally was I informed that my signal was going from S8 to 20 over, most of the gang just passed it off to rapid QSB.

After nine months of this rather foolish operation, the 30L1 using PRIDE tubes has had full output on all bands and there are no signs that the tubes have deteriorated in any way. It is very refreshing to find a radio supplier that knows what Collins owners need and have attempted to produce a product to meet our needs.

If you are looking for 811As or 572Bs that have been RF tested before they find your shack, give PRIDE Tubes a call at (800) 638-3925 or write PRIDE Tubes, 8200 South Memorial Parkway, Suite C, Huntsville, AL 35802. Your Collins will be glad you did!

COLLINS DEPENDABLE 75A-2 Receiver

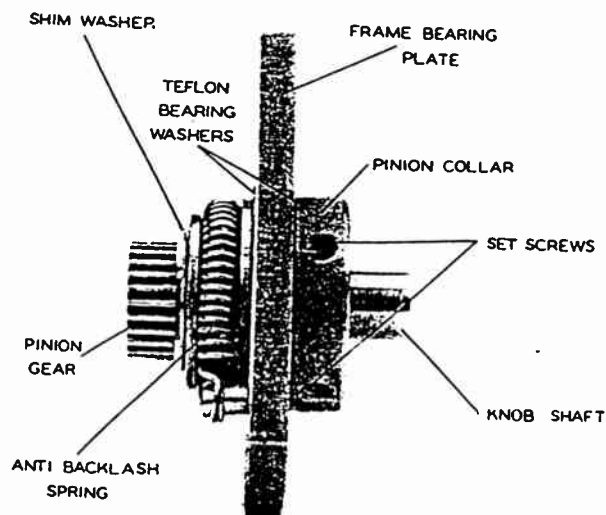


COLLINS VERNIER TUNING KNOB

The popular vernier tuning knob that was specifically designed for the Collins 75A4 receiver became retrofitted to other Collins sets such as the KWS-1, 32V series transmitters, 51J series, KW-1, 310B series and earlier 75A series receivers. The construction is such that it can be readily taken apart for cleaning and lubricating. The following information was excerpted from the official Collins instruction booklet on the knob.

Lubrication: If at any time, the knob loses its smoothness or begins to feel toothy, there is a possibility that the lubricant has become dirty or dried out. Remove the entire assembly from the receiver and wash the vernier mechanism in cleaning solvent - kerosene will do nicely with a toothbrush. Clean out the back of the tuning knob with a clean lintless cloth. Coat the ring gear teeth with a thin film of light grease such as Lubriplate or Vaseline. Disassemble the pinion from the pinion collar by releasing the two collar setscrews and withdrawing the pinion shaft. Wash the parts in solvent and then reassemble after first coating them with the light grease. Squeeze the pinion and the pinion collar together and tighten the setscrews. Assemble the remainder of the knob.

Adjustment: If the tuning knob feels wobbly, remove the knob, release the pinion collar setscrews (see figure) and squeeze the pinion and pinion collar together, then tighten the setscrews and replace the knob. If the tuning knob binds as it is rotated, remove the knob, release the pinion collar setscrews (see figure) and loosen the pinion and pinion collar. Tighten the setscrews and replace the knob. Continue adjusting the pinion and pinion collar until the knob turns freely with a minimum of wobble. The main dial should not move when the BFO control is rotated. If it does, tighten the pinion and pinion collar as described above.



S-Line Speaker Mounting

K9ARZ, Larry Stark

Ever since I purchased my first Collins S-Line receiver "umpteen" years ago, I have been bothered by the mounting of speakers in the 312-B3 and 516-F2 cabinets. The problem with speaker mounting is that it is usually accomplished by using machine screws through the front grill of the cabinet. Not only are the screws unsightly, but they have a tendency to dimple the soft aluminum of the front grill. Another problem resulting from this method of mounting is that vibrations can be transmitted by way of the screws to the front grill causing an annoying buzzing at certain audio frequency and volume levels.

A simple yet very neat way of mounting speakers in the S-Line cabinets involves the use of two (2) 8" x 10" picture mat boards with oval cut-outs. The type I use are marketed under the brand name "ELITE MATS" manufactured by U.S. MAT of Woodinville, Washington. The mats come in a variety of colors and I chose charcoal gray to match the color of the speaker cone so as to mask the cone once installed. Because the inside of the oval cut out (4-1/2" x 6-1/2") is white as one would expect with a framing mat, it is necessary to darken the white beveled edge with a black magic marker. The size of the cut-out is just perfect for the 5" x 7" Collins or Radio Shack (#40-1261) speaker.

Once the white part of the mat is darkened, center the grill material over the entire mat and trace around the grill with a soft lead pencil. Then using a metal ruler or straight edge and a good Xacto or hobby knife, cut the mat board to the same dimension as the grill. Do the same with a second piece of identical mat board. When both pieces of board are prepared, you are ready for mounting. Place one of the boards with the charcoal gray side down and center your speaker over the oval cut-out. Mark the holes for the speaker mount with pencil on the back of the mat. Using an awl or sharp punch (do not use a drill on the cardboard) make four holes large enough to pass a #6 x 32 screw.

The screws I used were flat-head recessed screws that become flush with the surface of the board when tightened down. Use large flat washers between the speaker and mounting nuts. Lock washers or a few drops of paint or varnish will ensure that the hardware will not vibrate loose.

The mat board with the speaker mounted on it will mount behind the L-bracket and will be isolated from the second mat board which merely serves as a trim board under the grill. Both of the latter pieces are mounted on the face side of the L-bracket. With this arrangement, there is complete isolation between grill and speaker, and the finished project looks identical to the way the 516-F2 comes from the factory without a speaker installed.

REPAIR OF THE SLUG RACK ASSEMBLY

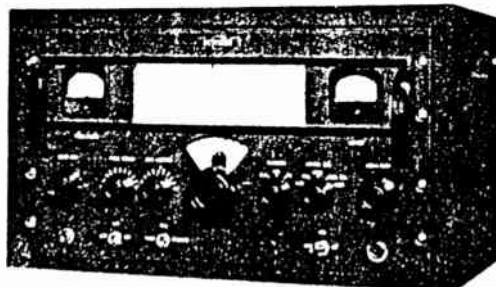
The tuning assembly used as the receiver preselector and transmitter exciter tuning may need occasional maintenance. Occasionally, one of the copper-colored bands that serve as belts to the assembly may break. In that case, brass shimming material of the same thickness may be substituted. This shimming stock can be purchased through an automobile parts supplier or automotive machine shop. Be careful not to lose the small spring clips that are used to place tension on the belts.

Carefully lay a good band over the shimming stock for a template. After marking, cut a new band with a pair of scissors. Apply a liberal amount of solder at either end for reinforcing. Or, the end of a solder lug can be soldered as a substitute eyelet at either end of the band. Next, punch a hole in either end with a small nail since a drill will twist the thin stock.

It is not necessary to remove the assembly for cleaning and relubrication. Before applying new lubricant, wipe off the old grease with a rag. To the rear of the assembly is a jam nut and set screw that applies tension to the cylinder through a small ball bearing. Remove the set screw - but do not lose the steel bearing. Apply any good lubricating grease inside the hole and to the cup of the setscrew. The correct procedure when retightening this set screw is to apply finger pressure to the slug holder in the "up" position (10 meters). When the correct tension is reached, there should not be any slippage when you move the slug rack holder with your finger in a downward movement. The front panel control knob should now run freely without any binding.

At the same time, force a liberal amount of grease into the large front bearings at the front of the tuning cylinder. A can of spray grease (white lithium) with a plastic tube works well for this procedure. You should also run a coating of grease on the vertical alignment rails both front and rear after wiping down these vertical rails.

Perhaps, you might check alignment of the slug rack using the procedure contained in the service manual. In most instances, this will not be necessary.



32V-3 Transmitter

CW FILTER LEVEL EQUALIZATION WITH THE S-LINE

By Edison Fong, WB6IQN and Emmy
Denton, KC6DSZ6

As most Collins S-Line owners know, when switching from the phone mode to the CW mode, a loss of 2 to 3, S-units is experienced due to the higher insertion loss of the CW filter. The standard 2.1 KHz phone filter such as the F455 FA-21 series have an insertion loss of about 10db with the 500 Hz CW filter having about 12 dB loss.

Technically, this should be barely be audible in terms of volume. But as most Collins users will tell you, the difference is significant. This is most likely due to the fact that the power bandwidth is narrower on the CW filter and thus will appear as lower volume at the speaker. Most users obviously live with this characteristic, but this problem had always annoyed me for some twenty years.

This winter I finally decided to tackle the perpetual problem. The first thought that came to mind was a modern solid state high frequency op amp set to a gain of 6-10 dB's inserted at the CW filter. This will certainly solve the problem. There are high frequency op amps readily available, but they are rather expensive and have limited high frequency response at 455 KHz. This solution will also require an additional power supply and its accompanying filtering, regulating, etc. since these op amps do not operate with B+ voltages of 140 volts.

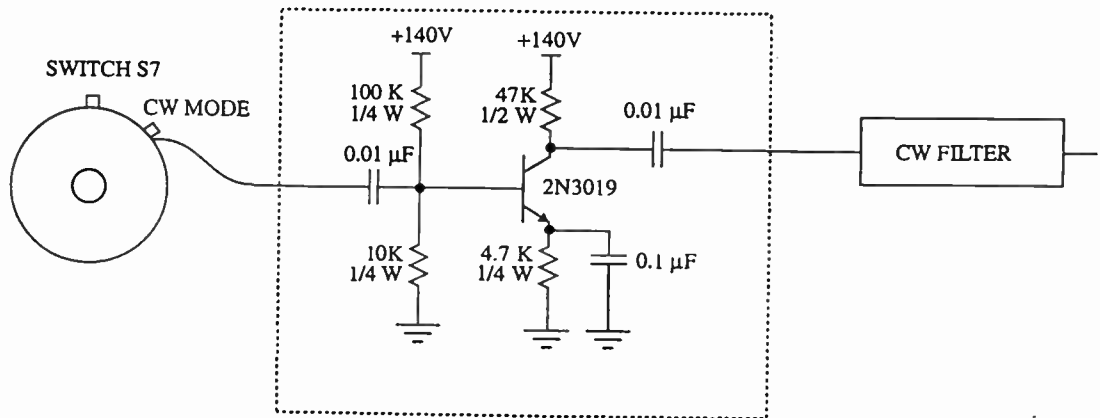
Did I want to add an extra pc board inside my 75S-1? Heavens no! My other alternative was to add an extra tube for gain, but this would have required an extra tube socket. Where would I place an extra socket in the S-Line?

With state of the art semiconductors, there are now low cost, high voltage, high frequency transistors available. Such a transistor is the National's 2N3019. With 140 volt V_{cbo} , 80 volts V_{ceo} , and an f_T of 100 Mhz, it makes an ideal high voltage untuned, 455 KHz IF amplifier. An extra power supply is not necessary since it can run directly off the 140 volt B+ line due to its superior high voltage performance.

The schematic for the amplifier is shown in the figure. All the components can be mounted around the CW filter and wafer switch S7 with some careful thought. An extra PC board or terminal strip was not necessary. The 140 volt line was taken from tube V4. Because of the high resistance values chosen, no heatsinking of the components are necessary. The 0.01uf coupling capacitors should be rated at 50 volts or greater. The 47K resistor must be 1/2 watt rated due to the power dissipation.

The extra amplification works great and literary pulls the CW signals out of the mud so to speak. You will no longer hear that sudden drop in gain while switching from SSB to CW. (Editor's note: This idea should really be appealing to the guys who use the 250 cycle crystal filter in their S-Lines.)

CW FILTER LEVEL EQUALIZATION WITH THE S-LINE



THE 35U-1 LOW PASS FILTER FOR THE 75A-4

Thanks to Arnold, W8UPG, for sending me the instruction sheets for this rather obscure accessory for the Collins 75A4 receiver. This add-on unit helped to reduce the interference to the reception of amateur signals sometimes occurring when the A4 receiver was located in the vicinity of a high powered television transmitting station. The filter, according to Collins Radio, provided not less than 70 dB attenuation to all signals above 60 megacycles.

The filter in a semikit form was designed to be installed in the antenna lead-in at the rear of the receiver. To install the kit, Collins advised that the ANTENNA terminal strip and the ANTENNA coaxial fitting at the rear of the 75A-4 must be removed from the set. The ANTENNA terminal strip was no longer used and could be discarded. But the coaxial fitting must be transferred to the 35U-1 filter box so care must be exercised in its removal from the 75A-4.

The filter terminates in 52 ohms/ If a higher impedance line is used, it was recommended that an external antenna tuner, balun, or balun coils be used to transform the line to 52 ohms, unbalanced for connection to the filter.

Early 75A-4 receivers used a type N connector and RG-8/U coaxial cable. In this case, the old receptacle cannot be mounted on the 35U-1 filter. In their instructions sheets, Collins recommended three options. By the way, the instructions that I have are the 2nd Edition, dated 15 February, 1958. I will be happy to reproduce these sheets for anyone requesting them. The schematic for the unit is given below.

COLLINS KWM-2 and 75S-3 MODIFICATIONS

BY

Warren Hall, K0ZQD

The following are a couple of "no-holes," easily removed changes that improve the M-2. Warren wants everyone to know that his modifications have not been authorized by Rockwell (Collins) International.

Incidentally, Warren, K0ZQD, will be at Dayton at spaces 2942-2943 with some Collins gear to sell.

Stabilize Voltage to the P.T.O.

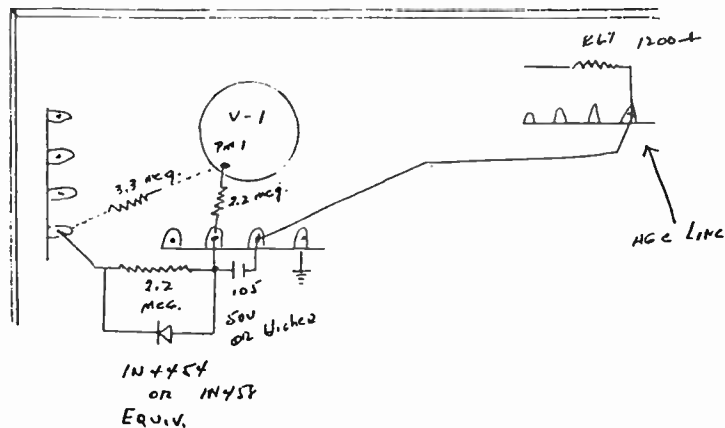
Remove J-26 RCA jack from the chassis and install in this hole a 150 volt, 10 watt stud mounted Zener diode. Attach a wire from the solder connector on the Zener to vector turrett E-60-A. No dropping resistor is required as the Zener runs cool! be.

AVC Release Time

To increase AVC release time, install a large capacitor (try .25 mfd. 200 volt) between vector turrett E-60-L and Pin 4 on the Noise Blanker socket. Pin 4 on NB socket is grounded when the front panel switch is switched to noise blanker position. To tailor the release time, choose a larger or smaller capacitor to suit your likes.

75S-3 AGC Change

Mount a 4 terminal strip (with 1 terminal grounded) under socket screw of V-2. Replace a 3.3 Meg. resistor with (2) 2.2 Meg. 1/2 watt resistors as per illustration. By using a four terminal strip, it allows room for the components used in modifying the 100 KC calibrator circuit. This produces a harmonic generator and levels out the 100 KC markers between 80 and 10 meters. (Note: this 100 KC modification can be lifted from the 75S3B,C schematic)



"S" Meter Drift

Put a diode (1N34 or 1N458 etc.) from V-7 Pin 7 to ground. Negative end to ground (Band end). This imposes a slight voltage on that tube and clamps it down a little. Measure the cold (turn-on set) voltage at Pin 1 of V-7 and V-6. Make a note of this reading. Let the rig warm up for an hour and measure these same pin voltages. If the voltage change is very much different from one tube to the other, select tubes that have more uniform warm-up characteristics. This voltage changes make the "S" meter go nuts!

TIDBITS

MICROPHONE PLUGS - The brass PL-68 plugs used as microphone plugs on Collins and other gear are getting more difficult to find. Japanese plated steel replacements are available but just don't have the look and feel of the original brass plugs. One of the reoccurring problems associated with this plug is the iron clamp used to immobilize the mic cord. The metal clamp becomes bent, difficult to reinstall and causes problems replacing the plastic cover that refuses to go over the larger diameter of the reinstalled metal clamp. Ten or so turns of unwaxed dental floss tied around the recess for the old clamp and a dab of fingernail polish will firmly fix the mic cord in place with the added benefit of being easy to remove without damaging the brass plug. (A "tip of the hat" to NSAMA for this idea)

COLLINS 75S RECEIVERS - Experiencing a loss of signal strength as evidenced by a low S-Meter reading - check the value of R16 a 47,000 ohm 1/2 watt resistor in the screen lead of the 6BA6-V4, 1st IF to the positive lead of the S-Meter. The value may have gone high which was the case in a recent 75S-1 that had this problem.

S16F2 POWER SUPPLY - If you find the low voltage reading higher than 285 volts, you might want to replace the input filter choke L2 which may be shorted. This choke tends to fail causing the voltage to rise since the circuit is now capacitive input rather than choke input.

COLLINS OFF/ON SWITCH - Failure of the A.C. switch located to the rear of the upper function switch on the KWM-2 and S-Lines is due to the surge of current when turning the set off. Before this happens, you have two alternatives: 1) use a power bar to control the A.C. input to the sets or 2) install a relay in the primary side of the S16F2 or PM-2 power supplies. The switch on the rig becomes the "trigger" to operate the relay that is installed on the power supply. Harry, W4ACN, recommends this change - if you want Harry to do this for you, see the Classified Ads in this issue.

CLEANER - Searching for an excellent switch, volume control cleaner that is fast drying with no residue, go to your local NAPA automotive parts store and ask for the product QD Electronic Cleaner packaged by CRC in a 11 oz. spray can. The part number is 765-1843. Locally, I can buy a can for \$4.99.

LUBRICANT - When applying a light grease to the exciter slug rack and switch detents of your S-Lines, try white lithium grease available in plastic tubes or in spray cans. Available at your NAPA dealer or K-Marts.
Warning: do not use any grease on the plastic dial parts.

RELAYS - Can't find a burnishing tool to clean the contacts of a relay. Consider using a small tear section of a plain brown bag. Hold the relay contacts closed and slide the paper back and forth. Can anything be any cheaper!

CATALOGS - Two of the best parts catalogs are FREE. Newark Electronics, Catalog 113 with 1488 pages can be gotten buy dialing 800-281-4320, ext. 46. Allied Electronic Supply with 1048 pages can be gotten b y dialing 800-433-5700.

- * Like a nice fat electronic reference catalog - Call Allied Radio, at (800) 433-5700. Note: Minimum order is \$50.00.
- * Replace your worn or defective speaker in your Collins 312B console units with Radio Shack Part Number 40-1261. This is the oval 5" x 7" unit.
- * Need an old hard-to-find twist-loc type filter capacitor, contact Everett Hoard of Frontier Electronics, Box 38 or 403 S. McIntosh Street, Lehr, North Dakota 58460 or call (701) 378-2341.
- * Replacement Collins meters and new face plates for S-Line equipment Contact Bartlett Instrument Company, 14th Street and Avenue M., P.O. Box 445, Fort Madison, Iowa 52627 or (319) 372-8366.
- * Can't find Bristol or spline wrenches to remove set screws from Collins gear etc. Try a set of Xcelite No. 99PS-60. This is a 11 piece set with handles. Manufactured by Cooper Tools. Try your local hardware or industrial tool supplier in your area.
- * Still an excellent source of hard-to-find parts: Fair Radio Sales Co., Inc. P.O. Box 1105, Lima, Ohio 45802. Send for their catalog.
- * If you need an exact color for touching up a piece of equipment. Go to K-MART or hobby store and buy an assortment of Testor bottled paint. With the right combination, you should be able to touch-up a scratch. Some commercial paint stores (Sherwin-Williams, etc.) have the new computer matching system that examines your original panel to determine the correct paint codes to mix. Not all stores have this sophisticated equipment yet.
- * A rather inexpensive replacement for the Collins AM mechanical filter may be ceramic filters Type CFM2 sold by Digi-Key (800) 344-4539. Listed as TOKO AM Ceramic Filters for only \$3.64 each, they could be a terrific bargain for the expensive originals. Request a free Digi-Key catalog to determine your exact filter needs.
- * Be careful when cleaning radio equipment with ordinary household cleaners especially ones that contain high concentrations of ammonia. Strong detergents can harm both paint and plastic parts. Many of the older front panels had a thin layer of paint applied that can be easily rubbed off if you apply too much pressure using a cleaner/wax.

- * The following paint formulas for Collins equipment: Your Pittsburgh Plate and Glass (PPG) paint dealer will know what these numbers and letter represent. All paint is PPG, Interior Enamel, Wall and Trim, Lo-Lustre Oil: Formulas are for (1) quart. For the Trim Rings on the S-Line/KWM-2: White and Pastel Mixing Base (20-110) 20-110 plus B10 plus C12. For the S-Line/KWM-2 Cabinets: Midtone Mixing Base (27-160) 20-150 plus B34 plus C12. The Saint James Color for the 75A, 32V, etc. is Neutral Mixing Base (20-554) B2Y+20 plus C14 plus W18 plus A12.
- * Black Wrinkle Paint is becoming very difficult to find. One company that still makes wrinkle paint in black only is SEYMOUR OF SYCAMORE, INC. located in Sycamore, Illinois. They claim to be one of the largest paint companies in the USA. Call them at (800) 435-4482 for a local distributor of their "Pit Crew" Wrinkle Finish No. 16-2448. The texture produced when "baked" in your kitchen oven or in the hot sun is extremely nice.

Some of you may recall that Pete Hoskins prior to his retirement operated a paint store in Marion, Iowa, that supplied custom paint to the Collins owner. In a telephone conversation several years ago Pete told me that his company supplied the Saint James wrinkle paint to the Collins factory. Pete recalled that on some days the paint technicians at Collins had to strip and repaint the metal panels when the finish did not come up to standards. To achieve that distinctive finish, he indicated that two paint additives, China Wood Oil and Cobalt Dryer were mixed into the paint. The sprayed on finish was baked in an oven for several minutes at 275 degrees Fahrenheit. Pete warned me that the finish that you are asking about cannot be done very easily - believe me I know what you are up against." More research has to be done on this subject.



Many of the set screws of the older radios are sometimes frozen when a type of green varnish was applied to the threads. Get out your soldering iron/pencil and very carefully apply the hot tip to the screw for maybe 30 seconds (or longer). If the screw does not turn with reasonable pressure, repeat the procedure for another 30 seconds and try again.

Dry transfer title and markings are available from DATAK Corporation, 65 Seventy-First Street, Guttenberg, NJ 07093 or (201) 869-2200. Free Catalog. Their most popular set is the "Amateur Radio and CB" set K59B in Black or K59W in White.

Gateway Electronics (new and surplus) at their Saint Louis store did have the ceramic trimmers for the Collins S-Line and KWM-2. Talk to Bill or John when calling. When I spoke to them on 02/22/94, they still had 30 or 40 pieces left. The number to call is (800) 669-5810 when ordering. Gateway operates three stores: their main store in Saint Louis, two others in San Diego, CA. and Denver, Colorado. Also ask for their flyers.

There are two Collins technical and swap nets on through the week. Sunday, at 3 PM EST on 14262 Khz. and Tuesday, at 8 P.M. EST on 3805 Khz. (newly started).

W7FG Vintage Manuals - Vintage and Modern manuals. We trade, or pay to copy yours. All manuals come bound with comb binders and card stock covers. 24 hour service includes 1st class postage. SASE for catalog or call for immediate help. 3300 Wayside Drive, Bartlesville, Oklahoma 74006. (918) 333-7893.

Need readily accessible paint. Try your Harley Davidson motorcycle dealer. They sell black wrinkle paint in 12 oz spray cans under number 98606 CJ. You can see how this paint wrinkles by inspecting a Harley in the sales area. They tell me that it airdrys with a little heat. Try two heavy coats: put one coat on then wait 5 minutes and put on second coat. Bake 2 hours at 150 degrees. If your oven has a window check on the wrinkling. The paint tends to begin to wrinkle from one corner and then rapidly sweep across the panel. I am buying a can to test. Make sure that you tell your wife why you are visiting the Harley dealer or she may be suspicious!

When a meter is not damped sufficiently especially when indicating signal strength or varying under plate current, try placing a 1 mfd. or lower capacitor directly across the meter terminals.

When you discover that one of the windings of a transformer is open, especially a power transformer, don't despair. In some instances, the transformer can be repaired. Many times the open is caused by a break in the connection of one end of the winding and the transformer lead. Once you disassemble the transformer look carefully where the leads are soldered. You may have to strip some of the insulation back to get to the one winding that is open. Carefully solder the winding lead to the larger connecting wire and you're back in business. What could have ended in the junk can was a transformer saved.

Collins speaker grills have a velvety surface applied that is known as "flocking." The material (wool-like) was sprayed on to a prepared sticky surface to give the appearance of cloth. If anyone can help us with a source, please let me know. I have called every hobby store in this area but no luck. Some clerks do remember years ago selling this stuff in a spray can.

Try guiding your screw into a hard to reach hole with a little grease applied to your screwdriver.

Warren, KOZQD, has a novel approach in polishing knobs on a buffing wheel. Attach the knob on a long 1/4" shaft rather than attempting to hold the knob in your hand where it can quickly become a "missile." Use a polishing rouge on the wheel and then go at it!

When reattaching the panel overlay to the your KWM-2/S-Line equipment, try using the type of "super glue" that is in a paste form since it won't have a tendency to run. However, if you opt to use a contact cement you may have to use a "C" clamp and a two blocks of soft wood to hold the panel securely to the aluminum front panel.

Bob Kemp sent me a tip on "restraightening" plastic dials, especially the one's on the Collins 75A series receivers etc. that have become warped in spots. Bob has been successful in bringing his 75A3 dial back its original shape. He starts by laying the dial on a flat surface and then taking a steam iron to gradually heat the areas that are warped. He used a terry cloth towel on the back of the dial. He dials the iron to a medium temperature and then checks every 2-3 seconds to see if the dial was not getting too pliable. After the dial warms, he presses a flat board to the front of the dial for a few minutes until the dial cooled. Like heat and check - heat and check! He said this method is preferred to a hair blow dryer. The key, of course, is to be extremely careful that you don't apply too much heat that could "stretch" the plastic or deform the markings.

Wayne, W6IRD, (714) 639-3982, can supply the screws that attach the PM-1 power supply to the Collins KWM-2. He also has spacers for the "feet" of the S-Line.

Ordinary bathroom cleanser like Comet does a nice job when cleaning aluminum. Use a little cleanser on a nylon scouring pad (the one that looks like a cloth) to clean the grime on a aluminum panel. Go back and forth in one direction to avoid swirls. These will clean, smooth, and shine metal surfaces without scratching or removing metal. They are much better than steel wool.

I had a problem the other day when attempting to realign a Collins 75A1 receiver. It seems that the ferrite core on one of the R.F. coils (20 meters) had become detached from the tuning rod. The ferrite rod did not fall out but merely was stuck in the coil, giving the appearance that it was moving up and down in the coil. If a stage does not peak, you might want to dig a little deeper and, perhaps, find this problem. Attaching the threaded rod to the ferrite core with a little epoxy cement should remedy the problem.

On the S-Line and KWM-2 equipment, there seems to be a clear coat that was applied to protect the surface. To restore these knobs, requires a little bit of care. Experiment with a clear spray varnish or poly from a spray can such as Krylon. The knobs of the R-390 are aluminum and can be resprayed using a semi-matt or semi-gloss black from a spray can. Remove the original paint using paint remover and then spray with a primer before the finish coat. A clear coat can be applied but not too heavy that it streaks or runs.

A great source of equipment manuals is: MIL-COM Exchange Electronics, P.O. Box 982, Orange Park, FL. 32067-0982. or (904) 282-7277. They have very high quality reprints available.

To fill in knob engravings, use lacquer-stik, just rub across until groove is filled in and wipe off excess. Available in White, Gold, Red, and Black.

To polish knobs, meter faces, or anything else plastic, use NOVUS Plastic Polish \$1 and 2 - works great at removing scratches and puts a deep shine on knobs. Both the lacquer-stik and NOVUS Polish are available from Antique Electronic Supply (See their ad in this issue)

Even an occasional realignment of I.F.'s can cause a powdered slug to become loose in the groove. Once you have the slug positioned at the "peak" for instance, then apply a few drop of wax from a lighted candle into both ends of the coil. This should set the slug from moving. The type of candle that works best here are those used to decorate a birthday cake. Pastel blue is my favorite!!!

Try tuning into the Collins Users Net on Tuesday's at 3805 Khz. at 8 P.M. EDST. This net is rather informally run with no real agenda. The 20 meter version of the Collins Users Net

meets each Sunday at 14263 Khz. at 2000Z or 4 P.M. EDST. This net is more formal with a net control station and a call-up by call areas.

Contact Jim, WA6PNP at (714) 620-5875 for Collins S-Line speaker grills, power supply screens for the resistor compartment of the 516 power supplies, and meter shields and relay brackets for the S-Line equipment.

If you didn't already know it, PRIDE Tubes actually tests each of their transmitting tubes in amplifiers before they are shipped. Besides their 811A's, PRIDE does market other transmitting tubes as well as audio and some receiving tubes. Give them a call on their toll free number when you are thinking about replacement tubes. (See their AD)

A reader has suggested that the reason for the Collins 32V transmitter low voltage power transformer failure was due to the leakage of the screen bypass capacitors to the screen of the 4D32 final amplifier tube. When these bathtub capacitors begin to leak, they place an additional strain on the low voltage transformer due to the increased current flow to ground. Because new bathtube capacitors are no longer manufactured, try bypassing the screen with a disk ceramic if you suspect a leaky capacitor. Measure the resistance to ground with the lead removed going to the screen reading. There should be infinite resistance.

Amperite Co., Inc. located at 600 Palisade Avenue, Union City, NJ 07087 is still in business after 71 years. These are the folks that supply the time delay relays for many of the Collins sets, like the 30S1. I talked to Steve Schlansky at (800) 752-2329 about their products and he indicated that they still make the original 180 second time delay relay tubes that are in the original glass envelope with 8 pins. Cost is \$29.99 plus \$2.00 for shipping. Amperite has a product catalog which I have just ordered. Steve looks forward to assisting any ham through direct sales who has need of an Amperite product.

Can't find suitable steel dial cord for your Collins receivers etc. Try plastic coated leader line that is stranded stainless steel No. 30 lb. test. One manufacturer is American Fishing Wire, in West Chester, PA.

Jammed powdered slugs in I.F. cans may be loosened by blowing hot air from a hair dryer into the top opening hole. If you are lucky, the slug can be removed. I would recommend coating the treads with common Vaseline before inserting.

A lot of discussion lately on tight PTOs in Collins rigs. Rather than dismount the PTO unit, try sticking the plastic straw from your WD-40 can into one of the screw holes (one that is self-threading). Shoot the inside with the lubricant to free or to soften the grease. You will have to do some research on this subject to find out which screw to remove to get access to the "guts" of the PTO - can anyone out there help us with this one?

Fusing the primary of a power transformer is fine; but did you know that the secondary could be fused as well. Rigs that need this kind of protection are the Hallicrafter HT-32/37, Collins 32V series etc. Try using a 1/2 amp fuse soldered from the center tap to ground.

"Filling-in" the engraving on knobs and front panels with white typewriter correction fluid is an easy solution to worn, yellowed markings. Try a slight bit of kerosene on a rag to remove any "over" application.

Many of the "quirks" (random oscillations, intermittent, unstable conditions etc) that appear in Collins, National etc. can be traced to poor grounding. Retighten the nuts and screws on all shield cans, all tube sockets and tie points where a ground lug is used whenever you experience such a problem.

Ordinary household ammonia works wonders when cleaning old equipment. Remove all plastic parts though like meters, dials, don't forget about protecting transformers with plastic bags or remove entirely. Spray liberally and then rinse with warm water. Finally, use a hair dryer to "blow-dry" the equipment. I have successfully cleaned a number of KWM-2's this way.

To make any wrinkle finish panel or cabinet glisten, apply a thin coat of Krylon Clear Spray to the surfaces. Works best on Collins wrinkle finish front panels to protect labeling.

More free parts catalogs: Hosfelt Electronics, Stubenville, Ohio, 800-524-6464; Mouser Electronics, Texas, California, NJ. 800-346-6873; Elmira Electronics, NY, 800-847-1695; All-Electronics, So. California (800)826-5432.

ESTIMATING HOURS OF USAGE: "Guess-timating" the actual condition of a Collins radio is sometimes difficult but not impossible. However, make no mistake about it – a high hour set will show its age despite cosmetic reconditioning. Without a running time meter who can say how old the set is especially when serial numbers were mixed on the later Collins sets (S-Lines). Would we choose a late round emblem or Rockwell unit over a winged early model KWM-2? Ultimately, it becomes a matter of condition, condition, condition! All of us appreciate an owner that has taken care not to abuse his investment. A slight layer of dust on the chassis is fine but not a layer of grime including heavy nicotine deposits that require a bathing of ammonia.

One obvious clue is to lift the lid on the radio and see if there is a heat spot directly over the audio output tube – 6EB8 for the KWM-2) or – the 6BF5 for the S-Line receivers on the lift up lid or if there are heat spots under resistors underneath the chassis. Underneath the chassis, look at the general sheen of the resistors especially the higher wattage ones and the electrolytic covers. Overtime, resistors and paper capacitors take on a dull appearance. Inspect the tube sockets. If they have been subjected to tube heat overtime, they will appear to be slightly darker and dull. Are there rub marks on the front panel especially under the loading control of the KWM-2, under the AVC control of the S-Line receivers, or around the audio level control? Do the stainless inserts on the knobs appear to have dulled and are excessively scratched? Is the nylon dial cord frayed exposing the steel inner cord. Does the set appear to the naked eye to be well cared for by a thoughtful owner. Unfortunately, much of this tale-tale evidence can be masked quite well especially if the set has been thoroughly restored with a good cleaning and cosmetic repair.

TOUCH-UP WORK: The "rubbings" where the paint is rubbed off particularly around the loading control and AVC control of the S-Line equipment and KWM-2 can be retouched. However, not with an artist's brush or a can of paint spray but rather with an air brush, a small paint sprayer used for close up work especially used by professional automotive painters. Matching the exact shade of the gray paint is rather tricky. The closest match is in an aerosol can labeled "Smoke Gray" from Rustoleum. Rather than puncture the can which is not advisable, point the nozzle into a container to "extract" the paint. You may have to tint with white or black to match the front panel color exactly. Use a small test panel to determine the right color. You should let this test panel dry before making the comparison.

POLISHING KNOBS: The black knobs found on the 75A and 32V series equipment often have surface scratches on the front surface that can be easily removed by the following process: Remove the knob and place it face down on a strip of No. 220 wet/dry emery paper, that you can pick up at any automotive parts dealership. Wet the paper slightly and rotate the knob in a circular pattern several times periodically inspecting to determine if any deep scratches have been removed. Next, lightly sand the knob using No. 600 paper that should remove any small hair-line scratches. Experiment with black shoe polish smeared on the emery paper rather than water. Shoe polish will be absorbed once the knob's surface is dulled helping to restore the knob's original luster. Finally, if you have an electric buffing wheel, try polishing the knob with a little wax polish applied to bring back the original luster.

COLLINS PTOs - If you are experiencing "excessive" binding or tightness when turning the main tuning knob, the problem can often be traced to the internal gear mechanism of the PTO itself. The original lubricant on the spiral gear mechanism tends to become stiff or hardened due to the ambient heat. The solution, of course, is to disassemble the PTO unit, repack the internal drive mechanism with white lithium grease after removing the original grease. If you need assistance, please write for a more detailed how-to-do article.

75A1 RF IMPROVEMENT - For improvement in receiver sensitivity, replace the 6AK5's with 6GM6's. According to W3HM, Howard, "the difference is very noticeable to both the ear and S-Meter."

METER INSTALLATION - Warren, KOZQD, sent us this tip on how to reinstall the nuts on the four meter studs of the S-Line or KWM-2. First, place a bathroom towel on your working surface to protect the front of the unit when you position the unit on its front panel. With a curved pair of forceps or long needle pliers, place the flat and lock washers in place. Remove the cotton from one end of an ordinary "Q tip" and thread one nut at a time on this end. One thread deep will hold the nut firmly in place as you position the nut on the stud. Finally tighten each nut securely - don't over do it - with the proper nut driver or suitable tool. A tip of the Collins hat to Warren for furnishing this idea.

S-LINE DIAL SLIPPAGE - If you have confidence in going through the procedure of removing the shaft bushing and shaft from the front bezel, the problem with slippage of the dial may not be a worn plastic inner dial so much as an out of adjustment pinch drive. Examine the clearance between the two hubs that pinch the dial. Very carefully, squeeze the two hubs together with a small set of pliers to readjust this clearance. I have done this with several sets, and the results have been very gratifying in removing the slippage in spots on the dial. You may find that the distance inside the two hubs have changed from wear. Reinstall the PTO and the bushing/shaft once engaged in the groove and you should be back in business with a very smooth running dial assembly.

ALIGNMENT: Typically, when you see someone in the process of realigning a radio, it is generally done with the unit out of the cabinet. It has been my experience that many Collins radios such as the KWM-2, in particular, can be tweaked up a bit with the cabinet installed.

PAINT FOR THE R-390: Try ACE Hardware Machine Gray spray paint for a very nice "military" type color when restoring the front panel of this set.

AUDIO TRANSFORMER FOR THE R-390A OR SP-600: To convert mil-spec audio out of these sets, buy a 70 volt line transformer at Radio Shack, P/n 32-1031 for \$5.99. It has primary taps of 10, 5, 2.5, 1.25 which ohm out at 500, 1000, 2000, 4000, and 8000 ohms. Run leads from receiver audio out to the 10w (5000 ohm) tap and common on the transformer. Secondary taps are 4, 8, and 16 ohm. Run leads from speaker to either 4, 8, or 16 ohm (whichever applies) and common. Result is excellent audio! The quality control varies somewhat, several sampled transformers vary somewhat on ohm value, i.e. 10 watt tap 625 ohms, 568 ohms etc. It doesn't seem to affect the audio though. The transformers are made in China which may explain the variance. "A tip of the Collins hat to Les of Gulfport, Miss. for these two tips.

COLLINS CABLING: The interconnecting cables for the KWM-2 and 30L1, the S-Line equipment etc. are of two distinct types: one is an audio cable and the other is an RF cable. Do not mix the two! The RF cable should be high quality 52 ohm cable preferably RG/62 and be used in RF circuitry. Using incorrect RF cabling can result in frequency tracing problems when using the 75S receiver and 32S transmitter combination.

THE 516-F2 POWER SUPPLY: A number of excellent modifications have been suggested for this power supply. However, we would like to offer our own opinions on this subject. First, if you are contemplating doing anything to this power supply, make sure you incorporate the A.C. relay modifications that has been floating around for years. Install at least a 10 amp relay in series with one leg of the A.C. and remotely switch the relay from the off/on switch on either the 32S transmitter or KWM-2 units. The relay can be mounted underneath the chassis or on top if you discard the L3 choke in the low voltage section. You will have to tie C5A and C5B together that now converts the filtering to a single section choke input. (See ER Number 62, June, 1994 issue). A suitable relay for this purpose can be purchased at a Radio Shack outlet.

My own opinion on this modification is to leave well enough alone and simply purchase a 4 or 6 outlet AC bar (with master kill switch) from a K-Mart or Wal-Mart store. The master switch on the bar performs all the switching for you when you leave the equipment in the "on" position. Keep in mind that the relay modification still requires manually switching the "off/on" switch on the Collins that decreases the life of the switch. However, I will concede that the inrush current is diminished considerably when using the relay.

A word of caution about the second most popular modification to these power supplies, and, that is, removing the 5R4 and 5U4 rectifier tubes and substituting solid state plug-in replacements or soldering a "chain" of suitably rated silicon diodes (total 2000 PIV) to the socket terminals underneath the chassis. Those who have changed from vacuum rectifiers to solid-state devices should know that the low voltage can rise above the recommended 275 volt value to approximately 360 volts during standby or 330 volts during keydown. A ten-percent to 20-percent increase in voltage is not uncommon using silicon rectifiers.

Therefore, the cure is to install two parallel 600 ohm-10 watt resistors in series with the center tap of the low-voltage secondary (red/yellow lead). If possible place these resistors near the chassis rail that will act as a heat sink. Bear in mind that C5A-B is a 400 volt unit and should be replaced at the same time. Without the two 600 ohm resistors, that capacitor is nearing its rating without those dropping resistors! Finding these two-10 watt resistors today compounds the problem.

Better yet, replace the 5R4 (HV), if you must, and retain the 5U4. Make sure you adjust the static current back to its original value by readjusting the bias pot.

A third modification employs a 100-volt 1-watt zener diode (HEP Z0438) between R8 and R9 junction. This device holds the bias voltage more constant especially during transformer loading in the CW position.

A fourth modification requires the replacement of CR1 selenium rectifier in the bias supply with a 600 PIV silicon diode.

DUST REMOVAL: If compressed air is not available to clean a dusty chassis, try using a moderately stiff 2 to 3 inch paint brush. A toothbrush works well, too in certain areas. You should be able to remove most of the dust and grime from above and below the chassis. Be careful not to apply too much pressure that could cause component leads to short against each other.

SOLDER JOINTS: Most if not all Collins radio had a slight dab of red coating on each solder joint to keep track of which joints had been inspected during assembly. Part of quality control, I imagine. Thus it is easy to determine whenever a joint has been resoldered by a "non-Collins employee." However, don't be fooled - some of us have repainted joints just to make them look like the original. If you want your radio to appear authenticate, try using candy apple nail polish. A sharp eye should be able to tell the difference, especially if the paint has just been recently applied - it just looks "fresher" than the original. Just make sure you tell your wife why you are in need of her nail polish! By the way, clear nail polish makes an excellent binder or cement for certain applications if Duco Cement is not available.

NEWARK ELECTRONICS: This large electronic mail order firm has moved. According to an informational postcard that I received, they indicated, "Due to our continued growth and the consequent need for larger facilities, Newark Electronics has relocated to: 100 Hightower Blvd., Pittsburgh, PA 15205-1134. Phone (412) 788-4790 or FAX (412) 788-1566. Some of you have received their free catalog and know how extensive their parts inventory is.

KNOB REFINISHING: Again, when refinishing those black knobs with a scribe line, use the end of a toothpick (which is less likely to scratch the knob than a metal pick) to "dig" out that old white residue. Next, refill the groove with a white lacquer stick or white typewriter correction fluid. A rag slightly damped with kerosene removes any excess. Shine the knob with black shoe polish - my preference.

THE AGE FACTOR: "Guess-timating" the actual age of the S-Line and KWM-2 is not easy if not impossible especially within a given model (see Charles Carney's article, this issue). Of course in terms of sequential dating, the 75S-1 model preceded the 75S-2, until the last model, 75S-3C. And, that the winged insignia preceded the round insignia models. And, that with the early KWM-2's, these sets did not have plug-in relays unless they were retrofitted. Collins Radio offered a relay modification kit for those so inclined as well as other modification kits through the 60's and 70's, thus making it difficult to determine age based upon the issuance of a dated field service bulletin. Not surprisingly, therefore, not many of our sets are original as shipped from the factory.

Next, the so called crystal check is often referred to as an indicator of establishing the age of the radio by examining the date code on the underside of the 100 Khz. crystal. However, in later years there was no date code on the crystal or couldn't someone have substituted crystals! The date codes as found on paper and electrolytic capacitors with a little bit of interpolation can provide somewhat of a clue.

On the other hand, a late model S-Line or KWM-2 can appear to be "old" just because it was used heavily or had been abused - like being left in an unheated damp room without the protection of some sort of cover. Parts show rust; components, particularly resistors, and tube sockets are scorched from extended service. Overall, the set has all the appearance of wear and abuse - especially evident when one inspects a radio used by a heavy smoker.

Thus, the desirability owning a "round emblem" S-Line or KWM-2 should not be overshadowed by the general condition or appearance of the radio. For instance, the distinction between a round or winged KWM-2 is not as consequential, in my opinion, as it is in the S-Line, between that of an early S-Line such as a 75S-1/32S-1 combo and the later combinations: 75S-3C and 32S-3C. On balance one should not be too impulsive to buy a late round emblem radio in average or poor condition if there is a winged model that is pristine or in like-new condition. The point is not to be so overly concerned or apologetic if your set is an early winged model in extremely fine condition and performs or exceeds factory specifications.

PILOT LAMP ASSEMBLIES: The two panel light assemblies for the KWM-2 and S-Line equipment are often a source of the problem rather than a burned out pilot lamp. Whenever the soldering lugs lose their tension or bonding to the barrel, the lamp is intermittent. One solution rather than replace the assembly is to run a bead of solder from the end of the lamp assembly to the ring of the solder terminal after thoroughly cleaning both pieces. Try cleaning the spring loaded pin to the rear rather than make a solid solder connection thus ruining the spring tension. This tip should effectively cure the intermittent that one assumes is a burned out 6 volt pilot light.

ANTENNA RELAY INSPECTION HOLE: Did you know that the later KWM-2's had an inspection hole cutout in the lower right hand side of the perforated PA cover. This may be a modification done by the military to allow access to the contacts for burnishing. The hole size is 3/4 inch with the hole positioned 2-1/2 inches from the top cover and 1-1/2 inches in from the front. The hold should just expose the contacts of the relay if done properly.

POWER TRANSFORMER FAILURE: Most of the older power transformers were rated for 110/115 AC input. However, it is not uncommon to meter 120 to 125 AC volts in today's house outlets. With the boost in voltage of 10 percent or more, these early transformers are subjected to stress that can lead to failure, not to mention, the increase in output voltage. What I am suggesting is that if you determine that the AC voltage is on the plus side of 120 volts, you might want to consider lowering the voltage to your equipment with a Variac or similar device. Forget that line that "it's just warm to the touch" approach in determining if a power transformer is operating within its duty cycle curve.

EXTENSION FEET: Ed, W3WDF, is advertising Collins type rubber feet for most Collins gray boxes and front leg elevators for Collins S-Line cabinets for the S-Line. Price is reasonable. Contact him at 8245 Garden Oaks Drive, San Antonio, TX 78266-1710 or (210) 651-9348.

KWM-2 RELAY (K-4): Multi-function relay K-4, adjacent to K2, may not be closing due to the failure of R163, a 6,000 ohm, 5 watt resistor located on vector turret E50 between terminals E and F. This resistor is in series with the 275 volt bus to provide operating voltage to the the coil of K-4. This resistor is prone to premature failure.

U.S. GOVERNMENT SURPLUS PROPERTY: Buying surplus military property is not all that difficult of a process.

First, you must know the location(s) of local Defense Reutilization and Marking Office or DRMO's in your area.

A list of such property locations can be secured by writing the national sales office at this address: Defense Reutilization and Marketing Service, 2163 Airways Blvd., Memphis, Tennessee 38114-5210 or call 1-800-222-DRNS. Ask for their Reference Pamphlet or How to Buy Pamphlet. The material will list property locations and contacts throughout the U.S.

The material is rather self-explanatory on procedures etc. for purchasing property on a bid basis. Good luck.

516-F2 POWER SUPPLIES: A drop in voltage under load, especially on the high voltage side, may indicate that the filter capacitors are leaky. Voltage drop on the low voltage side should be no more than 10 percent (20 volts is about normal) and about the same percent on the high voltage side.

If you ever replace the original cable on this power supply, make sure that you don't appreciably lengthen the interconnecting cable. From personal experience, I know that length is critical. When I measured the filament voltage at the KWM-2, I discovered that my ten foot interconnecting cable from the 516F2 power supply had dropped the filament by more than 1 volt. How often we assume that the problem is with the 32S or KWM-2 and not the 516F-2 or (PM-2).

WHERE ARE THEY NOW: For those of us who fondly remember those well-established firms that we did business with back in the 50's and 60's are still around.

EverReady Battery Co., Inc. Highway 441 North Alachua, Florida 32615 (904) 462-3911	Potter and Brumfield 200 S. Richland Creek Dr. Princeton, Ind. 47671 (812) 386-2316
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Stancor Corporation 9797 Reavis Road Saint Louis, MO 63123 (314) 865-8799	Ohmite Manuf. Co., Inc. 601 Howard Street Skokie, Ill. 60076 (708) 675-2600
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North American Capacitor Co. (formerly Mallory) 7545 Rockville Road Indianapolis, Indiana 46214 (317) 273-0090	Switchcraft Inc. 5555 N. Elston Ave. Chicago, Ill 60630 (312) 631-1234
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Vishay Sprague 678 Main Street Sanford, Maine 04073-0231 (207) 324-4140	Alpha Wire Corp. 711 Lidgerwood Ave. Elizabeth, NJ 97207 (800) 52-ALPHA
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Amphenol Corporation 1 Kennedy Avenue Danbury, Connecticut 06810 (203) 743-9272	Belden Wire and Cable Co. P.O. Box 198 Richmond, Ind. 47375 (317) 983-5200
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ITT Cannon 1851 E. Deere Avenue P.O. Box 35000 Santa Ana, CA 92705-5720 (714) 757-8301	International Resistor Co. P.O. Box 1860 Boone, NC 28607 (704) 264-8861
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A must replacement item is that aged original gray line cord. Out of sight - out of mind, I know. Stuffed behind those gray boxes - an accident just waiting to happen.

Speaking about premature failure. If you are blowing fuses, check for carbon paths around the 5R4 tube socket, especially between the top chassis plate and the socket itself.

While we're talking about this "old workhorse" of a power supply. Prices for good used unit are now eclipsing \$100. Have you ever given thought to the HP-23 power supplies that HEATHKIT sold for their SB-100 series transceivers and HW series transceivers.

With a new interconnecting cable, this power supply can be made to work quite nicely as a replacement unit at half the cost. I have seen HW-12 transceivers with this HP-23 power supply selling for under \$50 for both units.

REPLACING CAPACITORS AND RESISTORS: When removing an old capacitor or defective resistor from a terminal such as a tube socket, some restorers leave the lead in the set and solder the replacement to these leads. This eliminates the possibility of damage to the terminals when wiggling the old lead off the terminal. However, with desoldering ribbon or a desoldering tool, one can remove the original part quite nicely. I have seen it done both ways. But be aware that excessive strain to the terminal can leave you with a bigger problem to tackle.

FILTER CAPACITORS: You may have noticed that no manufacturer, to my knowledge, is making multi-section electrolytics. Keep a sharp eye out for those canned capacitors at hamfests. Even though they may be old stock, they should be ok. You can buy fresh single section electrolytics from a number of radio parts distributors such as Allied or Newark Electronics to solder on a terminal strip next to the old electrolytic. Frontier Electronics in Lehr, ND 58460 does rebuild multi-section units.

DIAL SCALE FOR 32V SERIES TRANSMITTERS: From April 10, 1947 until June 30, 1949, the 11 Meter band covered the range of 27.160-27.430 Mhz. The 32V-2 was announced in the August, 1949 issues of QST. It appeared that Collins Radio had everything ready to go and the FCC did it to them! The 11-Meter band was changed to cover 26.960-27.230 Mhz effective July 1, 1949, which made the 32V-2 dial for 11-Meters incorrect. The later slide rule dial on the 32V-3 had this change. What a subtle difference in models!

("A tip of the hat to our friend, Doug, K6PUN, for submitting this tidbit.)

KWS-1 BLOWER MOTOR: Replacement motor bearings for your KWS-1 can still be obtained. Contact source is FAFNER BEARINGS located in Warminster, PA (near Philadelphia), telephone number is (215) 672-9300. Their part number is 38KTD and the price is around \$22.00. They may not sell direct; ask for one of their distributors.

METERS - Need a new meter face or a new meter for your S-Line, KWM-2, 312B4, 30S-1. Contact Bartlett Instrument Company, 14th Street and Avenue M, P.O. Box 445, Fort Madison, Iowa 52627 or (319) 372-8366. They were the original supplier of meters to Collins.

PAINT - I still get a lot of inquires asking about repainting the earlier "black boxes," (75A and 32V series) in the original wrinkle finish. As far as I know, no one is packaging St. James Gray in a wrinkle. Your local Harley-Davidson Motorcycle dealer does sell black wrinkle paint in spray cans. The St. James Gray can be purchased from your editor in quart cans (See Ad in this issue) or be mixed by a PPG Paint supplier using the correct paint codes that I can send you. You will have to apply a mist coat using a spray gun over the black wrinkle to get the desired effect. Don't overlook having the work performed by a local automotive body shop, especially the applying the finish coat of St. James Gray. Touching up a marred panel or cabinet of the earlier Collins sets such as the 32V or 75A series etc., is another matter. Someone suggested using a sponge dipped with St. James Gray to cover a blemish. If you need more assistance on this subject, please write.

COLLINS EQUIPMENT 40-METER COVERAGE CHANGE

For those 40 meter enthusiasts that would like to shift coverage from 7.2-7.4 Mhz. to 7.1-7.3 Mhz, insert a new heterodyne crystal in position 2B that oscillates at 10.255 Mhz. This enables one to tune the entire 40-meter phone band in one segment.

S-LINE SPINNER KNOB

Because the S-Line weighted spinner knob is extremely hard to find, one might want to increase the ease of tuning by adding weight to increase inertia. Apply bathtub caulking to lead shot that you can obtain from a local firearms dealer. Position the lead shot in the backside cavity of the plastic knob. Adding or deleting weight is a matter of personal preference.

IF YOU HAVE ANY HELPFUL TIPS THAT YOU WOULD LIKE TO PASS ON, PLEASE SEND THEM TO US. ANY ITEM USED WILL GET A "TIP OF THE COLLINS HAT" FROM YOUR EDITOR.

