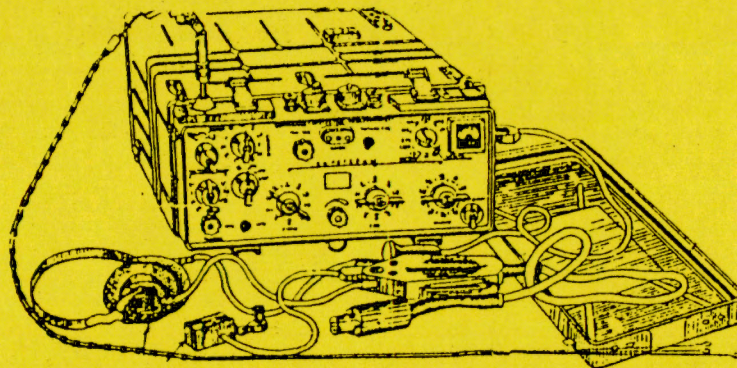


**Communication Equipment**  
**of The North Vietnamese Army**  
**and the Viet Cong**



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In 1954 when the Geneva Agreements were signed ending the French Indochina War, communications in both North and South Vietnam were in poor condition. Military equipment much of it left over from WWII, was worn out. Since the French had handled both military and civilian communications their departure left the Republic of Vietnam with little equipment and no native expertise. On the other hand, North Vietnam inherited the resources of the victorious Viet Minh: experienced communicators and a battle tested military signal organization.

While the South Vietnamese laboriously rebuilt military signal units with the logistical and training support of American advisers during the late 1950's, the North Vietnamese interlaced their homeland with an austere, but comprehensive, communications network. By 1960 a powerful North Vietnamese governmental agency, the General Directorate of Posts, Telecommunications, and Broadcasting, had rehabilitated the old French wire network and installed radio-telegraph stations in every province. Encouraged by promises of aid from several Communist allies, North Vietnam then boldly em-barked on an ambitious five-year modernization plan for telecommunications. The Communists intended to build a national microwave system, complete with automatic switchboards, to supplement the wire network. Automatic radio-teletype and voice radios would replace the existing radio-telegraph system, a slow, manual Morse net.

Although few of those hopes for modernization were actually fulfilled by the end of the five-year term of the plan, the optimistic outlook for North Vietnamese communications probably influenced Communist strategists meeting in Hanoi in September 1960 to consider whether the time was ripe to step up the insurgency in South Vietnam. They knew what prodigious demands such a campaign would make on North Vietnam's communicators. Reliable domestic communications to every province in North Vietnam would be essential in coordinating mobilization of the nation's resources and movement of men and material to the southern front. Since the insurgency was to be orchestrated directly from Hanoi, communicators also would have to establish extensive long-distance networks to meet the needs of both the Communist Party's political administration of an underground government in the faraway provinces of South Vietnam and the military's strategic direction of campaigns against the South Vietnamese Army. To support tactical operations within South Vietnam, the military and political cadres actually conducting the insurgency would require lightweight easily concealed radios. Undaunted by those requirements for domestic, strategic, and tactical communications, the North Vietnamese in December 1960 announced the establishment of the National Front for the Liberation of South Vietnam.

Communist leaders tried to insist that the National Liberation Front was a popular uprising of South Vietnamese nationalists displeased with Diem. Although the insurgents had a clandestine headquarters, called the Central Office for South Vietnam (COSVN), in a remote jungle area near the Cambodian border, doubtless Hanoi maintained direct communications with the communist bases throughout South Vietnam in addition to funneling strategic direction through the new field headquarters. Probably to relay communications from Hanoi to remote areas in the South, North Vietnamese communicators established a large communications complex at Dong Hoi about fifty miles north of the border with South Vietnam.

The oldest and most reliable strategic communications system available to the North Vietnamese was the clandestine communications-liaison network in operation since the

Franco-Viet Minh War along the Ho Chi Minh Trail. As infiltration increased in the early 1960's, communications-liaison took on increasing importance. By 1964 two communications-liaison battalions were handling strategic communications and infiltration along the trail.

To communicate general information, policy, and propaganda to South Vietnam, the North Vietnamese employed voice and telegraph radio broadcasting. The Vietnam News Agency, an operating arm of North Vietnam's General Directorate of Information, managed the activities of both Radio Hanoi, the official North Vietnamese radio network, and Radio Liberation, a clandestine station located in South Vietnam near the headquarters of the Central Office for South Vietnam. Much of the broadcast equipment had been manufactured in the United States and captured from the French. Recognizing early the importance of undermining the South Vietnamese people's confidence in and allegiance to their government, North Vietnamese propagandists began beaming specially prepared programs to South Vietnam over Radio Hanoi soon after the division of the two countries. By 1962, when the South Vietnamese domestic broadcasting network comprised only fifteen small transmitters, all less than 25 kilowatts in strength, North Vietnam had ten 100 kilowatt transmitters and several relays in Cambodia beaming Radio Hanoi's signal throughout South Vietnam.

To maintain the facade that the National Liberation Front was a legitimate revolutionary organization existing in-dependently of North Vietnam, Radio Liberation operated an international broadcast station. That transmitter, however, was located not in South Vietnam, but at the Radio Hanoi communications complex in Me Tri, a suburb of Hanoi. As Communist propaganda assumed an increasingly important role after the beginning of the Paris peace negotiations in 1968, the Me Tri complex grew to house twenty-three transmitters beaming broadcasts throughout the world in ten languages.

Of many special communications networks established as the insurgency accelerated during the early 1960's, one operated by the North Vietnamese strategic intelligence service, called the Research Agency, was the most comprehensive and active. To manage its covert operations in South Vietnam, the Research Agency used a combination of radio broadcast, courier, and radiotelegraph.

Organized into small cells of three or four agents with cover identities and false documents, the members of the Research Agency lived a seemingly normal life in South Vietnam while covertly gathering intelligence on American and South Vietnamese military and government activities. Because the cell's communicator was the only one routinely to make contact with any member of the Communist movement outside the cell, he had to be especially careful to preserve his cover. The communicators required only a radio receiver, usually a common Japanese transistor radio, to receive missions and instructions broadcast directly from Hanoi. To avoid arousing any suspicion, a cell communicator normally left his radio in plain sight at his place of business or home and at a specified time, on an assigned frequency, listened for his instructions broadcast in Morse code and encrypted. Couriers handled outgoing communications to avoid exposing the cell communicators to radio intercept. If an agent had an urgent message to send to the Research Agency, such as news of an imminent bombing attack, the communicator brought the message to one of several clandestine transmitters hidden throughout South Vietnam for just such a use. As a result, U.S. and Allied Forces captured large numbers of transistor radios.

By the time the American air campaign against North Vietnam began, the Communists in South Vietnam, capitalizing on political and religious dissension, were well established politically and had accumulated enough military strength through infiltration and recruitment in the South to challenge major units of the South Vietnamese Army. By late 1964 the Viet Cong had an army of 34,000 full-time guerrillas and about 100,000 part-time insurgents and sympathizers, and the North Vietnamese Army was moving several regiments into the northern provinces of

South Vietnam. From its jungle headquarters northwest of Saigon, the National Liberation Front controlled a territorial governmental structure comprising five military regions. Forming a Communist shadow of the legitimate governmental hierarchy within each region, the Viet Cong established committees down to the provincial and sometimes even the hamlet level. By mid-1964 they controlled more than half of the territory in twenty-two of South Vietnam's forty-three provinces.

Even after the size of the Viet Cong organization grew unwieldy, leaders in Hanoi were reluctant to relinquish control of the insurgency to the National Liberation Front. They continued to attempt to disguise their direct involvement in Viet Cong operations and to perpetrate the myth that the National Liberation Front was conducting a popular rebellion. To control and coordinate the activities of Viet Cong and North Vietnamese Army units operating in critical areas of the northernmost region of South Vietnam, Military Region 5, the high command established National Liberation Front headquarters there.

Because of the protean evolution of the insurgency, there was little standardization of Viet Cong signal organizations or equipment. Most signal units traced their origins to a single communicator serving as both radioman and messenger to a small Viet Minh cell during the 1950's. As the movement grew, so too did the communications organizations. In 1965 some uniformity in the organizational structure for communications began to appear: the Central Office for South Vietnam and Military Region 5 were each supported by 4 signal battalions, the other military regions and the infantry regiments all had organic signal companies, and provinces and battalions had signal platoons. Divisions of the North Vietnamese Army fighting in South Vietnam were supported by organic signal battalions. By late 1966 the Viet Cong and the North Vietnamese had approximately 150 combat battalions in the field under the command and control of thirty-two regimental headquarters and seven divisional headquarters. Besides the organic signal units assigned at each level, that entire force was supported by three area support signal battalions.

Dictated by the needs of the war and by available resources, command relationships, signal configurations, and organic equipment changed throughout the course of the conflict. Most communications units conformed to some type of tripartite organization- a battalion would have a radio company, a wire or telephone company and a messenger company. Whatever the organization, the quality and availability of Chinese, Soviet and captured American equipment usually dictated the actual capability of the unit. As the magnitude of the Communist military effort increased, new units assumed some missions of overburdened units. By 1972 for example, several signal battalions were supporting COSVN headquarters.

For a more thorough analysis, the reader should consult Chapter 16 of the book, **Military Communication, A Test For Technology**, by John Berger, from which the foregoing was extracted.

Let us now turn our attention to the tactical communication equipment used by the military forces of North Vietnam and the Viet Cong. By the mid-1960's the Chinese began to increase the amount of aid they provided the North Vietnamese. As a result the NVA was equipped almost exclusively with radios made in China and these began to move south into the Republic of Vietnam where they were eventually captured by U.S. Allied Forces. The United States Army had several classified documents that dealt with foreign radios. The FOMCAT Foreign Material Catalogue (SECRET) and a small green book put out by USAEUR, the U.S. Army Europe, that dealt with Soviet radios and was classified CONFIDENTIAL. Therefore, since these documents were classified, we could not inform U.S. troops of these radios in an unclassified manner. We in Technical Intelligence did secure permission to write about items in an unclassified format if the set was captured in South Vietnam. By

international agreement, the first "new" item captured in Vietnam went to the South Vietnamese government and subsequent items went to the U.S. Army.

In July 1967, the only issue of the Technical Intelligence Bulletin was published by the Combined Material Exploitation Center (CMEC). Most of the known radios that were in service in Vietnam were covered in some detail in this T.I.B. The CMEC also had an extensive display of captured radios and other communication equipment and was on the briefing circuit for incoming intelligence personnel.

Telephone systems were not employed on any large scale and were usually used in the higher headquarters in secure areas such as Laos and Cambodia. Occasionally this equipment was captured by U.S. and Allied Forces. The main field telephone was the Chinese Model 0743, a copy of the Soviet TAI-43, copied from the WW II German field telephone. A Chinese 10-line cordless switchboard was the most commonly encountered item. There were also Yugoslav desk telephones, Polish storage batteries as well as captured U.S. EE8 telephones. There was also a Field Telephone that resembled the US EE 8 but in a leather case and apparently made in Japan was recovered. By the end of the US involvement several variations of the Chinese Model 0743 telephon had been recovered. There was an export model which had a different number and still another variation called a CX 2 telephone. The only difference seems to be the data plate.

Routine administration and logistic matters were handled by couriers who carried recording tapes from point to point. Correspondence was put on magnetic recording tape which meant that a lot of material could be transferred in a small space. The most commonly encountered recorders were the small reel-to-reel sets that came out before the cassette recorders were on the market. Most of these recorders did not have a pinch roller and the speed of the tape across the recording head depended on where in the reel the tape was, the last portion usually going slower than the first part. In addition, the drain on the batteries was very heavy and as the batteries were worn down, tape speed slowed. It did give the VC a secure means of transmitting routine communications.

Radio communication was usually reserved for operations and intelligence with intelligence having the higher priority. Operations orders could be transmitted by courier but intelligence needed a faster means of transmission. There were several different types of radios in use by the North Vietnamese and the VC.

### **RADIOS THAT WERE USED BY THE NVA AND THE VC<sup>1</sup>**

Among the radios that were captured were the Type 71 B Radio Transceiver, which was a manpack AM radio which weighed 45 lbs. It covered 1.9 to 7.2 MHz and was 6 1/2" x 12" x 15". Power was provided by a D71 dry battery with taps for 1.5V, 7.5V, 90V and 150V.

#### **Chinese Type 102 E / XD 6 Station**

One of the most often captured radios was the Chicom Model 102 E which was manpacked or mounted in vehicles. This set was a copy of the U.S. AN/GRC 9 set with a few changes. The transmitter took up more space and the outer carrier, a metal chest housed the transmitter, receiver and a space for the D81 dry battery. The transmitter required a 6410 hand

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<sup>1</sup>Throughout this report the initials NVA, VC and PRC are used. They stand for North Vietnamese Army, Viet Cong and Peoples Republic of China and should not be confused with the East German National Volks Armeel or the PRC used for AN/PRC designations.

cranked generator or a 964IE dynamotor. The hand-cranked generator looked just like the U.S. versions but had a built-in voltmeter, an idea first seen in WW II Japanese generators. The set was a 15 watt set with a range of 75 miles, and covered 2-12 MHz. The complete set with accessories weighed 105 lbs. The receiver and transmitter alone weighed 38 lbs. This set was being replaced by the XD 6 set which had the same technical characteristics.

The Type 139 radio receiver was a manpack AM set which could be interchanged with the receiver of the 102E set. It was contained in a thin sheet metal case with a snap-on battery case and had a switch for connection to an external battery. The set weighed 10 lbs. without the batteries and was 6 1/2" x 10 1/2" x 11" and covered 2-12 MHz. Power requirements were 1.5 V and 90V. This set was known to be used by the Viet Cong.

The Chinese type 7512 Radio Receiver was an AM table model receiver that was well constructed but very heavy at 90 lbs. It was designed for fixed station use and operated on 110 or 220 volts. This set covered 1.5 to 25 MHz in 8 bands. Needless to say this set required access to commercial power or a portable generator.

### **The Type 63 Back Pack Radio**

The Type 63 manpack set was the newest item supplied by China. This set was probably intended as a replacement for the Model 71 B radio. This set looked like a copy of the U.S. WWII Walkie-Talkie but when the RT unit was removed from its case, it looked more like an AN/PRC 10. It weighed 35 lbs., was 3 1/2" x 10" x 16" and was powered by a D-63 dry battery with taps at 3V, 27V, 90V and 178.5 volts. It was estimated to be a 2 watt transmitter and covered 1.5 to 6 MHz. Unlike the U.S. counterparts this set had a built-in key for CW operation.

The other major Chinese set that had been captured by Allied Forces was the Chinese Type 601C Radio Transmitter. This was a high power set that was table or vehicular mounted. It weighed 45 lbs. and was 20" long, 8' high and 8 1/2" deep. The power requirement was 6 volts and 500 volts from a generator or dynamotor. This set was estimated to have a range of 75 to 2000 miles, again in the 2-12 MHz range with 3 bands and 6 preset crystals. Again, it was capable of voice or CW. This set was probably intended for communication between a major headquarters and Hanoi.

In addition to Chinese manufactured radios, there were Soviet generators, large Polish storage batteries and a host of small transistor AM sets from all over. In mid-1968 we recaptured an AN/GRC 9, a set from the 1950's that had been supplied to the South Vietnamese as part of the MAP - Military Assistance Program. It was captured by the VC and put into service on their side.

Soviet assistance in the area of radios was minimal. In late 1967, the 1st Cavalry Division Airmobile captured a Soviet R607 naval radio. It was captured while being landed from the sea. It never actually saw service in Vietnam. This was a huge setup, designed for installation on a ship or for a fixed base station.

The only known set of North Vietnamese manufacture was the VTS-2 Radio Receiver. It was contained in a square metal box. The set was 10" x 8" x 7" and used plug-in, tube shaped coils. There were six coils, four were stored in the top of the receiver, and two were in use. It used ten D cells for power and covered 1.9 to 12.2 MHz. The use of D cells made it very easy to purchase replacements on the local economy, a prime consideration for an army whose supply lines, better known as the Ho Chi Minh Trail, went through miles of jungle and was subject to constant bombing.

In addition to these sets, the Viet Cong used a number of "homemade" sets. The set described in the 1967 T.I.B. was a CW receiver and transmitter housed in a 50 cal. ammo can, 6" x 8" x 11" and weighed 11 lbs. without the battery. It was a 2 watt set with a range of 20 miles covering 3.8 to 6.8 MHz. It required 1 1/2 volts for tube filaments and 90 volts and 150 volts for plate supply. It had a hand wound coil. (In a previous article I described the reconstruction of a VC homemade radio in a 30 cal. ammo can. This 30 cal ammo can set was not covered in the 1967 T.I.B. so I assume it was captured much later in the conflict.) The article is included here, on the following pages.

The technical intelligence bulletin was never updated or reissued during the course of U.S. involvement in Vietnam. By 1972 the CMEC was shut down and the units were returned to the United States. In 1975 D Co./519th Military Intelligence Battalion was transferred to Aberdeen Proving Ground and began to function as a technical intelligence unit. A new and updated Technical Intelligence Bulletin was issued in the late 1970's. Included in the new T.I.B. was the Mercury Talk Transceiver, examples of which were on display at the Signal Corps museum and at Aberdeen Proving Ground. It is assumed that examples of this set were recovered in Vietnam in the latter stages of the conflict.

## **NEWER SETS IN THE CONFLICT**

### **Mercury Talk**

The Mercury Talk is a high frequency, continuous range transceiver with a frequency range of 1.7 to 6.0 MHz. It was first manufactured in the People's Republic of China (PRC) in the late 1960's. The Mercury Talk incorporates independent manual tuning for the receiver and transmitter sections. This feature allows the operator to receive and transmit on separate frequencies simultaneously. The Mercury Talk may use either a whip antenna, which is connected to both the receiver and transmitter, or long wire antennas, which may be connected separately to the receiver and transmitter. Two 12 volt DC batteries are connected in series to power the radio. In addition, a 1.5 volt DC battery is used to provide illumination for the dial lights. The Mercury Talk measures 33.7x22.7x 11.4 cm (13 1/4 x 9 x 4 1/2") and weighs 6.8kg (15 pounds) with batteries.

The Mercury Talk may be operated in either the Amplitude Modulated (Voice) or Continuous Wave (Morse) mode. The radio has a power output of 2 watts and a transmitting range of 10-16 km (7-10 miles) in the voice mode or a power output of 3.5 watts and a transmitting range of over 160 km (100 miles) in the morse mode. There is no speaker incorporated in the Mercury Talk; therefore, a headset or external speaker must be used when operating this radio. The narrow frequency range of the radio makes it extremely susceptible to electronic warfare (EW).

The Mercury Talk is ruggedly constructed, easy to operate, reliable and completely transistorized. Solid state construction in the Mercury Talk reflects an advancement in the state of the art for PRC communications equipment. Compared to the U.S. Army's AN/PRC 74 B, it is smaller and lighter, but it does not have the frequency range or the transmitting distance of the U.S. radio. Since the Mercury Talk is a continuous tune radio, it may be netted with U.S. AN/PRC-47 and AN/GRC-106 radios. The Mercury Talk is replacing older AM radios as part of an ongoing program to update communications equipment in the PRC Army

### **Mercury Walk Radio**

There is also a radio identified as the Mercury Walk Radio. It measures 8" x 6" x 3" and with the battery box added on the bottom, it is 11 " high. It is powered by 11 D cell batteries. All controls are on the top panel. It tunes 45 to 50. I assume this is MC. The top panel controls are located under a cover held closed by spring clamps such as found on U.S. military radios. Main tuning control had a lock down lever. Other covered controls were a two position switch and a

rotating dial, numbered 1 to 10, presumably a volume control. Two more controls are adjustable by screwdriver and there is a socket for plugging something in, presumably a calibration device.

On the ends are several more items. A rubber covered push button, presumably for morse code transmission and the antenna connector are on the right side. The antenna connector requires a special adapter to mount the Russian type Kulikov antenna. On the left side are a 7 pin connector for the head phone/mike set and a multi position rotary switch which presumably is a function switch. Off/On-Voice-CW.

The set is held in the case by two spring loaded clamps. On removal from the case, the set is modular in construction. There were 7 modules on one side(top) and a flip out module carrier on the other side(bottom) and a circuit board. The resistors looked like a tour through the history of resistors. Some resembled resistors of the 1930s and some looked like modern Radio Shack resistors. Capacitors were molded of olive drab plastic. There was nothing that looked like a tube socket so I concluded they were again hard wired inside the modules and were not readily apparent.

The central feature of the top side was a 7 gang variable capacitor. There were also three (4 ?) wire coils wound on ceramic forms. On the lower end, adjacent the battery box was a plug, into which the power cable would be plugged. The top section had a plug for something that was missing. It may have been a holder for a crystal for the CW mode. It also appeared that the top was suppose to have a metal cover but that was missing from the set that I have.

The battery box had several plastic spacers, trough like affairs to keep 8 of the D cells in line. At the power port end there were three more D Cells in a special holder. Power outputs were measured with weak dry cells and the 11 D cells provided 13.95 volts, 1.5 volts and 3 volts. There was also a separate plug for reading the voltage of the 8 D cell string. Presumably these provided filament, plate and dial lamp voltages.

The main advantage to this set was that it was powered by D Cells which could be obtained in local hardware stores. It is light weight, weighing less than the AN/PRC 25s and 77s of the period and less than the AN/PRC 10. The main disadvantage was the difficulty of servicing the set, especially in the field. Not having the headset/mike nor the antenna, missing some internal parts and possibly having dead tubes, any sort of operational testing was out of the question.

### **Chinese Type 883 Radio**

The Type 883 Transceiver is a lightweight, compact, battery powered, frequency modulated (FM) man-pack radio. This radio was first manufactured in the Peoples Republic of China in approximately 1965 and was standard issue in the PRC's army. This transceiver was also exported to several other countries in southeast Asia. The transceiver can be continuously tuned over a frequency range of 45-50 megahertz and is powered by dry cell batteries. The battery source consist of four D cells (BA 30 ) and a D 62 battery pack. The entire unit is housed in an aluminum die cast case which is painted a glossy, khaki colored enamel and has a total weight, with accessories of 13.5 lb ( 6.5 kg)

The transceiver is designed for short range communications and has a transmitting range of approximately 1 mile; however, by carefully selecting a transmission site, the transmitters range can be extended to as much as 4 miles.

The Type 883 jhas several limitations. The major problem with this transceiver is that it lacks internal calibration. With out internal calibration it is impossible for the operator to accurately determine if the actual frequency on which the transceiver is operating matches the reading on



the frequency dial. In addition, organizational maintenance on the type 883 is difficult because the parts are soldered to the chassis instead of the plug in type. The set is also very susceptible to electronic warfare due to its narrow frequency range.. Also the transceiver is unbalanced and awkward to carry because the battery compartment is attached to one side of the case.

The 883 however can be netted with the the AN/PRC 25, AN/PRC 77, AN/PRR 9, AN/PRT-4A and the AN/VRC 12 family of radios. The set was considered obsolete in 1975 and was being replaced by newer man-pack radios.

Front panel contrls are the minimum needed. On the left side is a toggle switch for volume control. Below this is the 4 pin headset connector. On the far right side is a dial light switch and the antenna connector. As with several other radios this set uses a Soviet designed Kulikov antenna but requires a special mating connector. The center section of the set, which is under a liftable cover has the frequency tuning knob, knob lock and frequency indicator dial. There is also a test socket cover, ergo, there must be a test set made for this radio. The battery box has the on/off switch for the radio

The complete set consists of the transceiver, an accessory bag, the antenna, the microphone and headset and an accessory box. While I have the radio, the headset and microphone and antenna, I have never seen the accessory box or bag so can not comment on what it contained. The picture of the accessory box would indicate tools and spare fuzes

This radio was designed to provide communication between platoon, company and battalion levels. As such it is comparable in role to the AN/PRC 25 and 77 sets. It is not the best set for use by a force conducting guerilla warfare, which is probably why it was never seen in Vietnam prior to 1968. It must be assume that these sets were issued to the NVA in time for their 1972 offensive and for the final assault in 1975. Presumably these sets were recovered by US forces after the 1972 offensive and were discussed in a 1975 Technical Intelligence bulletin prepared by the 11th Military Intelligence Company.

By the time these radios entered the conflict, the U.S. effort in Vietnam was winding down, the technical intelligence effort had departed and there was the possibility that some of these sets came home with GI's as war relics means that they are more likely to be encountered than some of the older sets. The collector valus of these sets depends on how badly you want the set and how complete the set is. Obviously the more complete the set, the higher the value.

### **DISPOSITION OF CAPTURED RADIOS**

Those sets that were captured before or during my time in Vietnam (1967-1968) were for the most part dismantled so the component parts could be photographed. The remaining chassis was sent to the scrap metal yard. Those sets that were not destroyed were sent back to test and evaluation centers in the USA.

Examples of these radios were on display at the Signal Corps Museum and at Aberdeen Proving Ground's Foreign Material Intelligence complex. There are others in various Military Museums through out the nited States. Several have shown up in private collections.

As a result very few of these sets survived. In the 30 years since I left Vietnam, I have only encountered three Chinese field telephones, one Type 63 backpack radio. The Type 63 that I got was missing the battery box and all the accessories. This was not too surprising as the set had 26 bullet holes and was beyond restoration and an R 139 A transistorized receiver that I am not certain was in Vietnam during the period of U.S. involvement.

## Chinese Type 139 A Radio Receiver

A general description of the set, reveals that the Chinese Type 139 A Radio Receiver is also late Vietnam war, if in fact it was part of the conflict. It is probably the replacement for the Type 139 Radio Receiver which was a tube set and was powered by a 90 volt dry cell and 1.5 volt dry cells. As of September 1968, none of the R 139A sets had been captured by US forces to the best of my knowledge. This particular set had a serial number of 70 1917. It was speculated that it was made in 1970 and was really set number 1917. This has not been confirmed by any source. If in fact it was made in 1970, it would have entered the Vietnam Conflict in 1971 or 1972, just as the U.S was pulling out and the Technical Intelligence effort ceased to function.

### Physical Description :

The set is 10 inches wide, 3 and 1/2 inches deep and 5 inches high. The battery box and four rubber feet add another two inches to the set, making the overall height 7 inches. The weight, with out batteries is approximately 6 lbs, more with all 7 batteries in place. There are sling swivels on either side, indicating that it was designed to be carried over the shoulder, similar to a Ladies handbag. Spring loaded snap catches (4) hold the front panel cover on the set. An additional; four snap catches hold the battery box on the bottom. The battery box is hinged and can not be completely separated from the radio.

This set is all solid state and is powered by 7 D cells, providing 9 volts and 1 1/2 volts. The radio is removed from the case by unscrewing four captive screws and then sliding the radio out of the case. Difficult to do as there are no real handles, only one knob for pulling. The set tends to stick to the rubber gasket and the power plug is a tight fit in the connecting socket. This is probably due to age. Once out of the case, there is an extension of the power cable and plug which plugs into the set and allows it to be used with the batteries in the battery case while the set is being worked on. This was no doubt inspired from looking at the Japanese radios of WW II.

There are provisions on the front and the side for a pair of headphones to be used. The plug sockets are smaller than the standard 1/4 inch and larger than the standard mini plugs available in the USA, which means the original headphones must be obtained or a means of rewiring developed for use with US style plugs. The headphone jack on the side panel and on the front panel are encased in a plastic shield which makes the set water tight. It also makes re-wiring almost impossible with out damaging the seals.

### Front Panel Controls:

On the bottom left are three controls. The far left control is marked in Chinese and has the number 0 in the center. It is connected to a potentiometer. The center control indicated volume. Turning it clockwise increases the volume. It too was a potentiometer. The control on the right rotates through 360 degrees but has markings on the case through 180 degrees. It is connected to a small variable capacitor and is probably for adjusting the antenna.

Above these controls is the main tuning control. It has a screw down clamp to hold the dial fast however this did not seem to be working. Above this control are two smaller controls which are connected to switches. They are 3/8 inch in diameter and not that easy to turn. One switch is connected to the dial light and derives power from the 1 1/2 volt battery. (On this set, the dial light was burned out), I could not identify what the other switch was for. Both have contacts which are easily bent. The light switch when turned, did nothing until it was pushed in. Either the contacts were bent or the object was to have the light available for tuning but not on until the switch button was depressed. To the right is the main tuning dial and window. The window is lighted, as mentioned. Three scales are visible in the window.

On the upper right side is a 3 position switch marked 1, 2 and 3 which is probably the band switch. Below this is another control, a 5 position rotary switch. This seems to be a sort of

function control, Off and whatever else. (The position on the far left put the switch rotator in contact with an empty space so it must have been the off position.) Below this is one of the two jacks for the head phone connection. Two more items are on the front panel, screw terminals with the symbols for antenna and ground. Another screw terminal is located on the top of the set. At first I thought it might be for an antenna connection for when the set was installed in a vehicle. A second jack socket was located on the side which was for a second set of headphones.

**Interior Construction:**

The set is modular in construction and is made up of circuit boards which can be replaced if one is found to be defective. All controls are mounted on the front panel and the modules are mounted on the front panel or a metal frame, similar to the Japanese sets of WW II. Were it not for the transistors, one would think one was looking at a late war Japanese set.

The center area of the set contains the three gang tuning capacitor. A worm gear meshes with a gear that turns the capacitor. At the other end is another gear train which turns the tuning dial. Very rugged construction and probably capable of withstanding rough handling.

There are three tuning modules mounted on top of the set. Another control, the band selector switch, is mechanically linked to three rotary switches, one per tuning module. Each of the three modules had three coils, the rotary switches and assorted capacitors, resistors and other items, believed to be capacitors, which appeared to be adjustable through access ports on the top of the module covers. These appeared to have been set at the factory and were not really designed for field repairmen to work on. They were sealed in position at the factory with a form of glue.

There are two other modules, one on the side which had three IF transformers but were not adjustable as the tops had been sealed with solder at the factory. This module also had a plug in crystal which was marked 500 KHZ. There were three transistors, 10 capacitors and 23 resistors. The capacitors were in metal cans and were the PC board mounting type. The resistors were 1/4 watt resistors. There were two other items, both in metal cans, one of which had two leads so I assume it was a capacitor. This module was electrically connected to the potentiometer on the front panel which was also connected to ground.

The second module was on the bottom and had two interstage transformers, 15 capacitors that I could see, at least one transistor and numerous resistors. This module was in such a position that the parts could not easily be seen. There were at least 6 resistors. There was evidence of corrosion on some of the parts. Most of the capacitors had insulated sleeves over them to shield them from one another.

The final component was a square metal can that plugged in to a socket. Contact was made by two screws that fit into sockets. This did not seem to be the best method of plugging something in but presumably it worked.

**Operating Characteristics:**

The tuning dial was graduated in three scales, one from 1.5 to 3.6, the second from 3.6 to 8.5 and the third from 8.5 to 18.0. I assume these are megacycles. Most of the older Chinese tactical sets operated on 2 to 12 Megacycles. Other characteristics are not currently available.

**Tactical Employment:**

The Chinese military is not as dependent on radio communication as the American army is. In many cases, the subordinate units have a receiver only so they can listen for instructions but can not ask questions or respond. This set can be used in a weather warning role as well as listening for coded messages.

**Strengths and weaknesses:**

Principle strength of the set is it's compact size, rugged construction and it's ability to run on flash light D cells, found in most every hardware store. Major weakness is the fact that it

is not easily repaired. Removal of either of the two side or lower modules would require considerable labor. Replacement of one or more of the tuning modules would require removal of all three so that the shaft for the rotary switches can be withdrawn. In addition, while there are three separate modules, they are all built on one printed circuit board. Any major damage to a tuning module requires replacement of all three. It is my opinion that this set is basically a throw away set. If anything breaks down, throw it away and get a new one.

#### **Collector Value**

Difficult to place a value on this set. It is not readily identifiable as part of the North Vietnamese or Viet Cong arsenal during the period of the U.S. effort during the Vietnam War. Probably worth about \$150 to \$200.00 to a serious collector. Would be worth more if the headset were included as well as antenna, technical manual and a schematic. An interesting piece of Radio History of the Chinese Armed Forces. It is also one of the first Chinese military sets to use transistors, a step forward for the Chinese Radio industry.

#### **The Viet Cong Home Brew sets**

There are at least three "home brew" radios known to exist. The first was shown in the July 1967 T.I.B. and was a transmitter and receiver built into a chassis that fitted into a Cal. .50 ammunition can. Very little effort was given to an analysis of this set. The voltages, the frequency range and power requirements were about all that was listed. One of my projects was to build a copy of the set. I ended up with the standard 6L6 transmitter circuit, but with a different 1.5 volt filament tube, using a coil wound on a section of cardboard tube with taps that fed to an octal tube socket. Changing the jumper wire in the socket changed the number of turns in the plate coil, as must have been done on the original. The set was tested by Jim Kearman at the time he worked for the ARRL and it worked. The receiver was a two tube set with a 1S5 detector and a 1T4 for an amplifier. When all else fails to get a radio working, I send it to Don Dean in Sarasota and he managed to get it working for me. The original set has been lost so it can not be studied in any detail.

The second "Home Brew" set was built into a Cal .30 ammo can and is described in the following article, which was published in Electric Radio Magazine.

#### **VIET CONG HOME BUILT RADIO**

by LTC William L. Howard  
219 Harborview Lane  
Largo, Florida 33770

In the early stages of the Vietnam conflict, the Viet Minh and later the Viet Cong were equipped with a variety of leftover WWII weapons supplemented by what they could fabricate in their underground factories. Communication equipment was also in short supply. This began to change and by 1967, the Viet Cong and North Vietnamese Army were equipped with sets made in China. The X06, copied in part from the US WW II SCR694, the Mercury Talk Set which resembled a WWII Japanese set and the Type 63 backpack set which looked like an ANIPRC-10 mounted in a BC-boo were among the sets that were captured. Occasionally, a Soviet radio would show up but these were few and far between.

Captured radio sets were first evacuated to the nearest Radio Research Unit, the local version if the N.S.A. and responsible for signal intercept operations where information of immediate intelligence value was recorded. Primarily this was frequency and range of the set. When Radio Research finished with the set it was evacuated to the Combined Material Exploitation Center (C.M.E.C.) for detailed technical intelligence exploitation. In most cases this resulted in the destruction of the set as all the components were removed and the remaining

hulks were sent to the scrap yard. Samples of each set were placed in the C.M.E.C. museum and used for training new intelligence personnel. There were very few radios used by the Viet Cong, fewer captured by U.S. Forces and very few came back to the states in private hands. Today these sets are very scarce.

In 1988, while a guest at the dedication of the new Foreign Material Intelligence Complex at Aberdeen Proving Ground, I went through the Ordnance Museum. The C.M.E.C. Museum in Vietnam had been evacuated and was now part of the Ordnance Museum. Many of the enemy weapons I had helped to evacuate were on display. One of the more unusual items was a Viet Cong "Home Brew" Radio built to fit into a standard U.S. 30 cal ammunition can. I took several photos through the glass case but these photos revealed very little other than subminiature tubes were used. Several years later through the efforts of Bill Seaby, the set was taken from the case and a set of detailed photographs was sent to me.

The set was originally designed to be two radios on one chassis. Only one side was wired so it is open to speculation what the other side was to become. One part was a shielded variable capacitor, tube and coil. The remainder had four tube sockets, two variable capacitors and a large hole in the chassis, possibly for a coil. The side that was wired seemed to be a regenerative detector with three stages of audio amplification. There was one tube ahead of the detector which could have been an RF amplifier but there was no coil for such a stage. Subminiature sockets were used throughout the set. The coil for the receiver was wound on the base of an octal tube and an octal tube socket was mounted in the center of the chassis. Without any tubes in the set and a broken coil, the set was inoperable and simply a display item. Without being able to examine the set in detail, it was impossible to trace the wiring diagram but it appeared to be a regenerative detector with a capacitor coupled amplification system. The resistors went either to a bus bar wire or were grounded to the chassis. The final stage was connected to an output transformer which seemed to be for the purpose of isolating B+ from the chassis. The transformer output was grounded to the chassis and a red wire went to the headphone socket.

I decided that it would make an interesting project to duplicate this set and see if it could be made to work. The original set was made from a series of panels held together by brass machine screws. I obtained an ammunition can and began the process of making a cardboard chassis. Side panels, back panel and front panel were then cut from aluminum. The center panel and shields were also cut from aluminum. A template for the center panel was laid out, after all the parts were assembled and a second template was made for the front panel. Finding parts that duplicated the original set was difficult. Miniature 7 pin tube sockets of the same color as the original were finally located as were other parts. Then the main chassis and all panels were taken to a local metal working shop where holes and cutouts were done and the chassis was assembled.

The tuning capacitor was mounted on the center divider panel and a local machine shop was contacted to turn a dial/drive pulley. Once the mechanical work was completed, the other components were mounted and the set began to take shape. The filaments were wired first, one lead to chassis and one lead to the main power switch. The chassis was A+ and B-. B+ was then wired to a bus bar wire and the output transformer was wired into the circuit. This set does not have a lot of room for wires and the lead to the headphone socket was buried under the other parts. The amplifier section was then wired. Resistors with proper values that resembled the original set were easy to find but capacitors were difficult. I used modern capacitors as I felt they were more reliable.

The detector portion was then wired and coupled to the amplification stages through an RF choke. Since I could not find a circuit for an RF amplifier that did not use a coil, I decided to eliminate the first tube. The coil was wound on an octal tube base with a cardboard insert and

plugged into the socket. The set was powered up and nothing happened! I had a local collector go over the set and we reached the conclusion the the problem was in the detector circuit. After several further attempts to get the set operational I gave in and took the set to Don Dean in Sarasota who repairs old time radios. Don went over the set and finally got it to work. He rewired the coil and eliminated two stages of amplification. The end result was that a 1S5 tube was used for the detector and a 1T4 was used as an amplifier. In Sarasota, with a good antenna the set picked up 5 local AM Stations. In Largo it got three stations using a 30 foot copper wire antenna. The set now sits on the shelf as part of my Technical Intelligence Museum Displays.

Several conclusions were reached as a result of this project. The first is that the set could have been made much smaller and still put in an ammo can and there would have been room for batteries, head set and antenna. The second conclusion was that it would have been easier to use a long strip of aluminum bent to shape than to have made it from separate panels. Of course, the Viet Cong may not have had a long strip of aluminum and were forced to use small scraps for the chassis. It is questionable if the original set ever saw service or was captured when U.S. Forces overran the underground factory. It is also possible that they could not get the original set to work which is why it was dropped and the other side was never wired. Shortly after this article was published in ELECTRIC RADIO Magazine, I received several letters with circuits for an RF amplifier that did not require a coil.

### **Third confirmed Ammo Can Radio**

The third known "Home brew" set was shown in a photograph sent to me by Jan Schrader from the collection of photographs he brought home from Vietnam. The set was shown next to a crate of ammunition which looked like it was for a WW II Japanese howitzer. There was a Chinese howitzer that used the same caliber ammunition as the WW II Japanese gun. I assume that the radio was made in the 1950's or early 1960s and captured very early in the war. It was not mentioned in the 1967 T.I. B. This radio set has disappeared and all that remains of it is the photograph. No effort has been made to make a reproduction of the set.

### **Several More "Almost Rans"**

The first set which I call an "Almost ran" set started as an attempt in 1988 to reconstruct a VC ammo can radio that I saw on display at the Ordnance Museum. Photographed from outside the display case, I could not tell very much but knew what the top panel controls were and saw 7 pin miniature tube sockets. I obtained an ammo can at a local surplus store. I then made up a cardboard model of what was wanted and drew in the diagram of all the parts. I then contacted a machine shop to fabricate a chassis, and drill holes for tube sockets. Once this was completed, I took it home and began to mount the components. I had to rig up some form of pulley arrangement to get the dial drive to turn the receiver tuning capacitor. I divided the set into a receiver section and a transmitter section. At this time my knowledge of radio circuits was limited and I took the set to Craig Smith and asked him to "wire it so it looked good". The set then sat on the shelf with no further work being done on it other than to make a battery pack for it that looked reasonable.

I then decided that I would make up some accessories for it. An antenna holder was made from hardware store nuts and bolts, scrap wood and some sections of a bamboo rod. Next came a similar set up for the ground contact and some old wooden boxes were converted into "spares boxes" holding tubes, crystals, coils and a few other items. The set looked pretty realistic, even if it was not really wired to work.

I ran across a set of plans for a vibrator power supply that worked from either 110 volts or a 6 volt battery. One day I was at Vulcan Surplus in Tampa and managed to get all the parts

needed for a vibrator power supply. The transformer did not have a 110 volt winding in the primary but that was not a major problem. Again I drew up a cardboard pattern for a power supply that would fit into a .50 cal size ammo can. I got all the components mounted and wired. I was not certain if I had done it correctly and wanted someone to check it out for me before I put power to it. No one locally could do anything on it.

The local outfit that works on old time car radios refused to even look at it as it was not an "Old time Car Radio" It too joined the R/T unit sitting on the shelf.

As previously mentioned, a friend in the Baltimore area managed to get the Ordnance Museum director to take the original set out of the museum case and he took some very detailed photos of the set. The original model was nothing like I had imagined and my re-construction was completely different than the original. I decided to start over. I made up a new template and built a second set. This set worked and is on display. The original attempt was relegated to the corner to collect dust.

In 1997, some 10 years after I had started the original project, I became acquainted with Mark Gluch in the Detroit area. I contacted him, and sent the vibrator power supply up to him. He managed to get it working and sent it back to me. He got the vibrator portion working but it quickly burned out several of the capacitors as the secondary of the power transformer was incorrectly wired. Replacing the capacitors that were damaged, the power supply came to life. Running from a 6 volt storage battery, it puts out 375 volts and 150 volts with no load on it. Now what? I started wondering if the receiver and transmitter could be made to work.

I dug out the original set and tore apart the wiring in the transmitter and rewired it as the standard classic 6L6 transmtter that was described in the book, "GOLDEN CLASSICS OF YESTERYEAR" by Dave Ingram, K4TWJ. Of course the 6L6 tube was too big for the set as built so I planned to use a 6V6 tube which is about an inch shorter. I figured if the 6V6 was good enough for the WW II British Para set, it would work here. Once rewired, I sent it back up to Mark Gluch to see if it was working.

The receiver was a bit more of a challenge. I found a circuit in the RCA Receiving Tube manual that looked like it would work. It called for 12 volt, 35 volt and 50 volt filament tubes running from 110 VAC. I managed to come up with 6 volt minature tubes that would work and began to redesign and re wire the set. The tube line up that was selected was the 6 BE 6, Pentagrid Converter, 6 BA 6 as IF amplifier, 6 AV 6 as Diode detector, Audio Amp and AVC and a 6 AQ 5 as the power amplifier.

While this set never saw service in the Vietnam War, it is representative of the type radios that could be built in clandestine underground factories, with a minimum of tools. Tin shears, a power drill, a hole punch, soldering iron, screwdriver, files and a volt meter were about all that I had to work with, when I assembled this radio.

#### **Another almost ran set**

In the process of researching circuits that were in existance and simple to build in the 1945 to 1960 time frame, I came on a two tube regenerative circuit called the "Doerle Globe Trotter". I constricted a small set about 4 inches by 2 inches by 10 inches which would fit into the standard AK 47 style ammo bandolier. The battery pack was the same size and antennas, headphone and other accessories fit into the side pockets. It worked reasonably well for the broadcast bands in central Florida. With a little experimentation, it could have been made even smaller. I used a Type 19 tube. Since that time, I have found a report on a Japanese WW II radio called the 1568 radio which used three 1 T 4 tubes. A similar minature tube could have been used for a smaller set.

The conclusions I made from constructing these "almost rans" is that all sorts of radios could have been made by the Viet Cong and probably were. They were limited only by their imagination and availability of parts. A second conclusion is that anyone trying to collect Chinese/NVA/VC radios needs to be aware that replicas can be easily made of the VC ammo can radios. Unless well documented, the radio is worth the price of the parts and a small amount for the labor, depending on how much labor is involved

### **North Vietnamese Agent Radio**

In 1994 the Central Intelligence Agency declassified many documents to include an article in an in-house magazine titled Adversary Agent Radios that was written by James J. Fauth and published in Vol 10 the Winter Issue 1966. Despite several errors, the article had some good information. There were three considerations for agent radios, beyond the basic one of signal strength (and consequent circuit reliability) which were paramount in the design of agent radios, Security, portability, and simplicity of operation. Simplicity of operation was the inverse of the requirements for operator skill and training. The more sophisticated the equipment, the less training was required.

The article discussed Bulgarian, Polish, Soviet, East German and the Asian bloc which included China, Korea and North Vietnam. The Asian bloc radios were less impressive and less disparate than in Europe. All used older techniques as Soviet knowledge of high speed automatic keying systems was not shared with the Asians. The most advanced radio shown was a Chinese set supposedly made in 1963. A North Korean set was shown which was hand made and came complete in a large storage chest.

The North Vietnamese set that was shown was listed as being of 1963 vintage but I question the accuracy of the CIA's dates. The set was probably captured in 1963. Looking at a 4th generation photocopy does not provide much detail but the set appeared to be two sets, probably a receiver and a transmitter. The parts were mounted on a front panel or a chassis panel which was attached to the front panel. The "chassis" had no side panels for strength. Guessing at the size, based on the components the sets were probably 12 inches wide and 6 inches high. The "chassis" portion was probably about 4 inches deep. Both sets were mounted in a metal chest, much like some of the WW II Japanese sets. The one set that was removed from the case looked much like the Japanese TM Handy Wireless set which slid in and out of a case. While the Japanese set was a bakelite panel attached to a wooden base, this set was made of metal.

The caption under the picture read: "A simple two tube transmitter and regenerative receiver believed to be used by the Viet Cong. The system is contained in a crude square container; it apparently operates on dry cell batteries." The CIA article said that operating from jungle base camps, constantly on the move and communicating over ranges of 100 to 200 miles the set was adequate.

I tend to question that this was an "Agent Radio" in the true sense but more likely just another of their home brew sets used for all forms of communication.

### **North Vietnamese Signal Intercept operations**

Thus far we have dealt with the radios used by the NVA and the VC for tactical and intelligence communication. Let us turn our attention to the radio intercept units of the North Vietnamese Army. While in Vietnam many re-captured U.S. radios were turned over to the CMEC by capturing units and the U.S. Radio Research units. My reaction at the time was "interesting but so what!" I was more concerned with the latest technological advances made by



the Russians and Chinese. The Soviet IMP fully transistorized mine detector was a technological surprise to us, a re-captured AN/PRC 25 set was not!

During the 1970's I served as an instructor at the Armor Officer Advanced Course and taught a block on Signal communications. One aspect of the course was viewing a classified film on the North Vietnamese Army Signal intercept units. The main purpose of showing the film was to show how important proper communication procedures, authentication, etc. was to a successful military operation. The film began with an introduction by "Sgt so and so" who announced "he was Dead" but before he died, this is what happened. It showed how communications were compromised by sloppy operators. Over the years I have made several requests to have the film declassified so it could be shown to all personnel but efforts thus far to have it declassified have met with failure.

The film was based on the capture of a North Vietnamese Signal Intercept operation and the interrogation of the captured personnel. The unit was about the size of a large squad and had female personnel as well as male personnel. The women did menial jobs such as routine house keeping, were in charge of setting up and taking down the antennas, going into town for food, cooking and running messages to and from clandestine drops.

The male personnel were the radio operators and they monitored U.S. and South Vietnamese communication on a 24 hour basis. Those people not monitoring the radios were engaged in routine radio maintenance and up keep, battery charging, etc.

The NVA signal intercept units made extensive use of captured AN/PRC 25 sets to monitor U.S. radio traffic. U.S. operators were very careless in their operations and very verbose. As a result, many U.S. operations were disclosed in advance to the enemy. Once advanced knowledge of a U.S. operation was known, the intercept unit would use their 102 E or XD-6 set to alert a higher headquarters and VC/NVA troops in the area were warned and managed to escape. We bombed a lot of empty rice paddies and our infantry swept through many deserted villages as a result.

While the captured AN/PRC 25 radios worked well with the flexible ribbon antenna stuck up through the ground, the 102 E or XD 6 sets required a long wire antenna. Once it was decided that an urgent message needed to be sent, the women got out from their underground holes and erected the antenna wire. The principle radio operator would then tune up and send the message while the other members of the team took turns cranking the generator. When finished sending, the antenna was quickly collapsed and taken back underground. It was on one such transmission that one of the girls did not get the antenna down quickly enough and did not get it back underground before a patrol swept through the area. Alerted by an antenna wire in an "empty field", they made a much more detailed search and found the signal intercept unit.

These units also did more than monitor our transmissions. In many cases the South Vietnamese would call for air strikes or artillery fire missions in support of an operation. As soon as the request was sent, the NVA signal unit would come up on the same frequency and cancel the request. The South Vietnamese did not seem to follow authentication procedures and neither did the Americans.

In summary, Chinese supplied radios were the backbone of NVA/VC communication. These sets were adequate for the task and while there is nothing remarkable about their circuitry or design, they are highly prized collector items due to their scarcity. Chinese telephones show up from time to time and sell for about \$125.00. Radios on the other hand command much higher than normal prices. In the mid 1980s a "Chinese Radio and Switchboard" were offered for sale at \$2,500.00 for both items. At that price I did not even bother to follow up on the type. In the early 1990's a "Chinese hand cranked generator" was offered for sale but by the time I

learned of it, it had been sold for about \$75.00 I find that many people confuse Japanese items with Chinese and vice versa. Many "Japanese Items" turn out to be Chinese.

### **OBSERVATIONS AND CONCLUSIONS**

The first observation that one can make is that the Viet Minh and later the NVA and VC were strongly influenced by what they saw of the WW II Japanese Signal Service. The Japanese had signal units that were triangular with a telephone section, a radio section, and a messenger section. The Viet Minh and later the NVC and VC copied this organization.

The Chinese were also impressed by radios that they got from WW II Lend Lease and items captured from the Japanese. Preferring the US design radios, they copied their 102 E set from the US SCR 694 radio. They also liked the idea of a volt meter on the hand cranked generator used by the Japanese so they added that to their radios.

When they got the technology to make sub miniature tubes such as those used in the AN/PRC 6 and 10, they liked them for the smaller size. However, unlike the American versions which had tube sockets, the Chinese simply hard wired the tubes into the circuit board. With the high pay scales of electronic technicians in the United States, you do not want a technician spending a lot of time soldering tubes in and out of a circuit. On the other hand, the Chinese workers who were paid about 50 cents a day and a bowl of rice could be used to solder tubes all day long. That was cheaper than making tube sockets. It is also highly probable that they did not plan a large logistic support facility for radios. If a set broke down, throw it away and get a new set. Again, labor being very cheap, the radios cost less to make than they would if made in the United States.

The Viet Minh used what ever they could scrounge from captured stocks of WW II material. Japanese and German weapons were the predominant small arms as well as some Russian designed/ Chinese made copies. There is no reason to think communications equipment was any different. To the best of my knowledge no Japanese or German radios were captured and by 1965 most radios came from China. Any radios captured from the Japanese may have been used in training in North Vietnam.

The North Vietnamese Army, as the Viet Minh became, began to resemble a modern army with modern equipment as early as the late 1950s. As Chinese radios became obsolete in the Chinese Army, they were sent south to Vietnam, in much the same manner as the Russians supplied the Warsaw Pact nations with their obsolete radios. North Vietnam did not develop an extensive electronics industry, preferring to rely on foreign aid from other communist countries. The only notable exception was the VTS-2 radio.

The Viet Cong, as the South Vietnamese communist insurgency was known, evoked much sympathy from the Americans despite being the "enemy". This was usually based on their inept performance on the battlefield. One remark made about them was that no matter who won the war, they would be the losers. They were, however, very resourceful people who made much of what they needed, such as rifles, pistols, mines and hand grenades. Radios were no exception. The various "ammo can radios" attest to this fact. Most seem to have been made from parts taken from junked commercial radios.

Asian military forces, unlike European and Western armies have been predominantly infantry forces. The requirements for extensive radio communication that is found in an armored force does not exist in most Asian armies. As a result, they do not have as many radios, do not have an extensive radio manufacturing capability and therefore have less radios. This is one reason why there are so few VC/NVA radios in existence today.

### **Chinese Industrial Efforts**

Chinese industry seems to be better at copying somebody else's technology. Most of their weapons are copied from Russian or American plans. During the Korean war their weapons were copied from WW II Russian plans, most notably the PPSH 41 sub machine guns and later the PPS 43 submachine guns, and the 75 mm recoilless rifle which was a copy of the U.S. recoilless rifle. The few radios that were captured by U.S. forces during the Korean war were Russian made sets such as the 10 RT used in tanks. In the post Korean war era, they copied the Russian SKS, AK-47 and RPD Light Machine guns. These were copied in 1956 and Chinese AK-47s are properly called Type 56 assault rifle, etc. Chinese tanks are simply copies of Russian tanks.

The Chinese seem to have made great strides in creating a radio/electronics industry but once again, were dependent on the Russians for the basic plan/technology. As was pointed out in the CIA article, the Russian's have not supplied them with high speed keying equipment, burst encoders, etc.

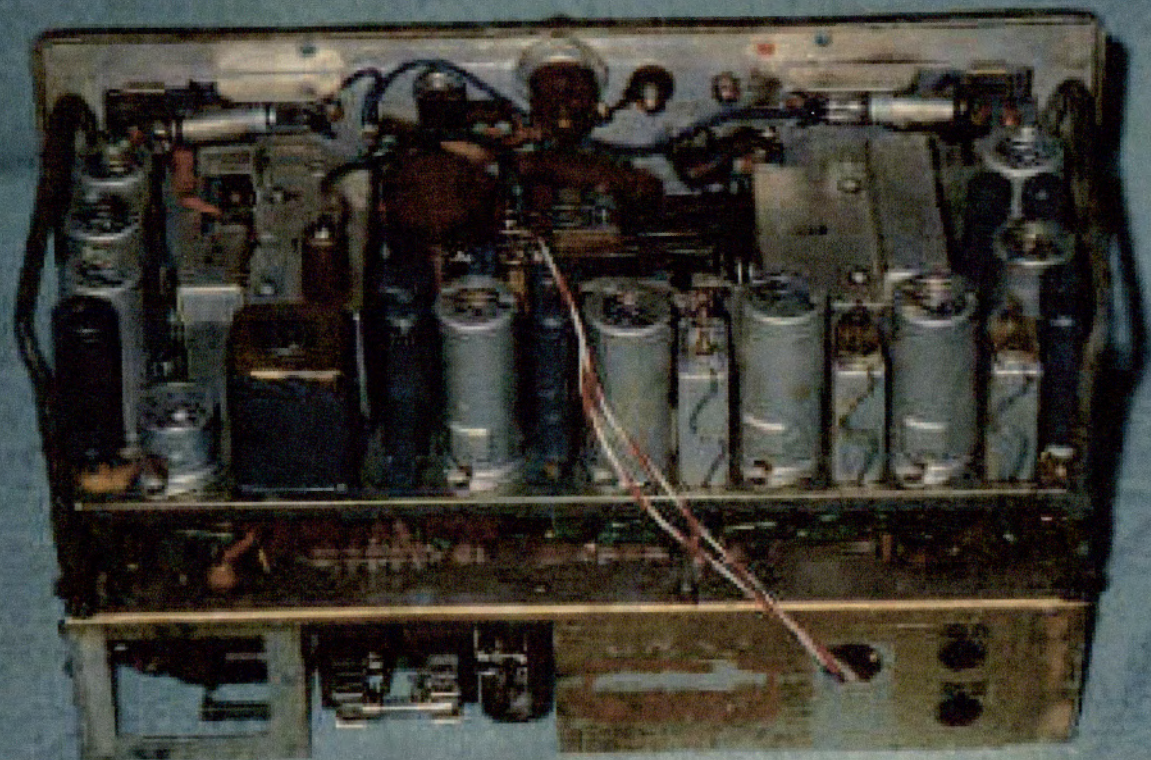
Several Chinese radios have been made for tanks and one was discussed in a prior series on the Radios of Desert Storm. Other items found during Desert Storm were Chinese Silk Worm missiles so it can be concluded that the Chinese are getting involved in Missile technology. This however is beyond the scope of this short article.

William L. Howard  
LTC Armor USAR(Retd)  
CMEC 1967-1968

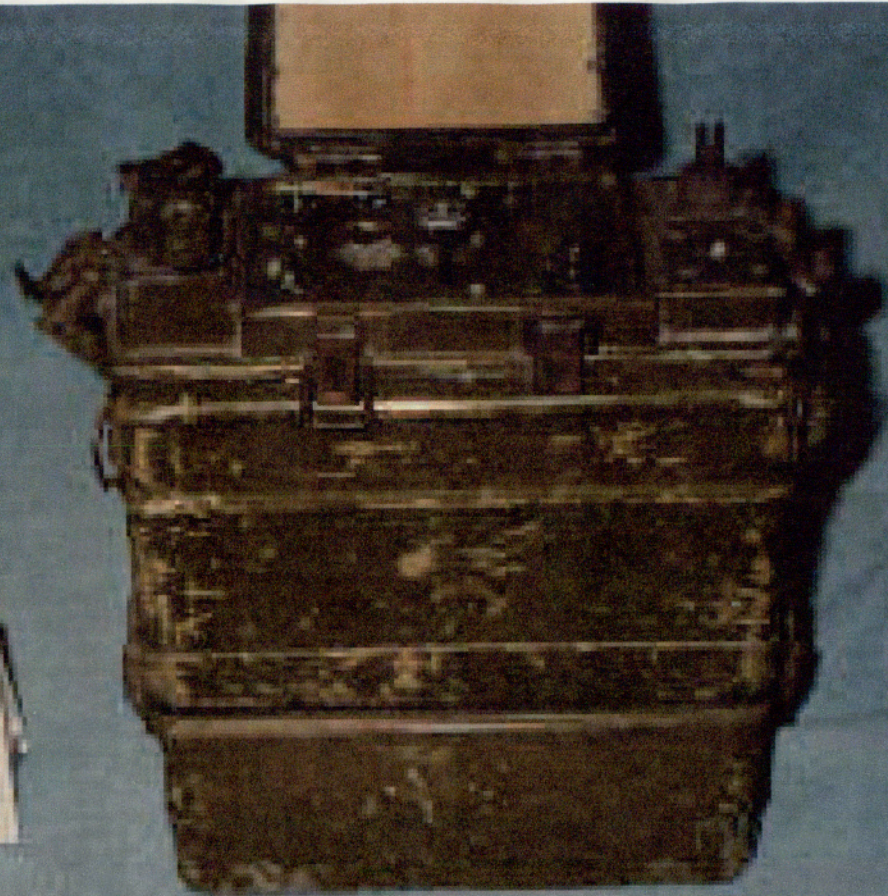
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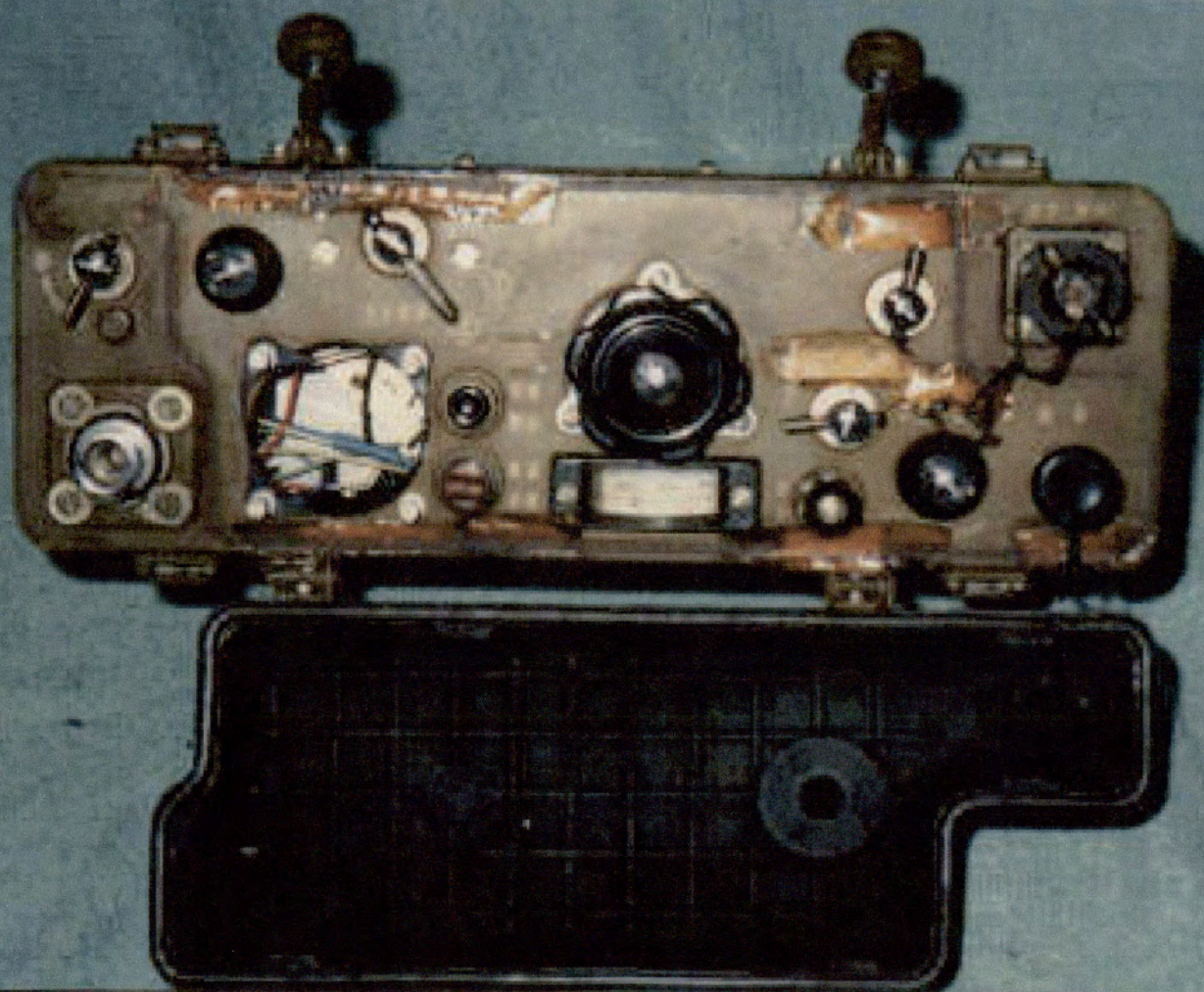


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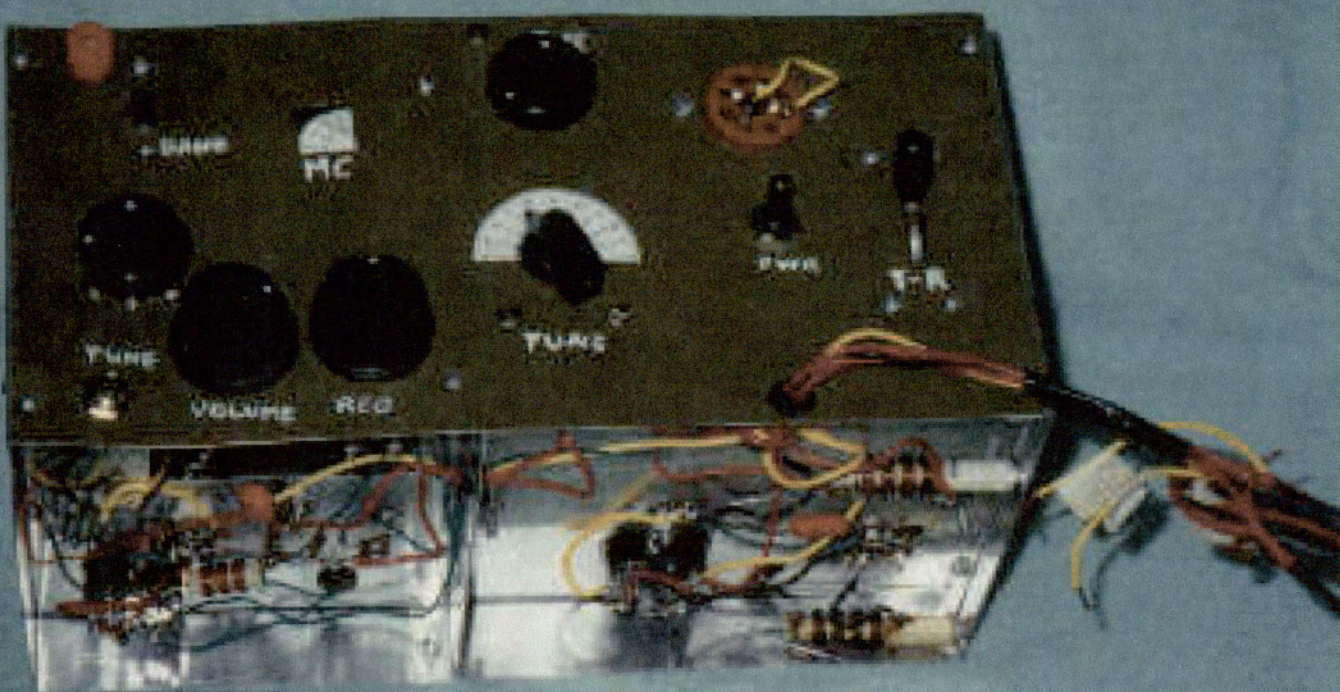


Control panel display with text and indicators.

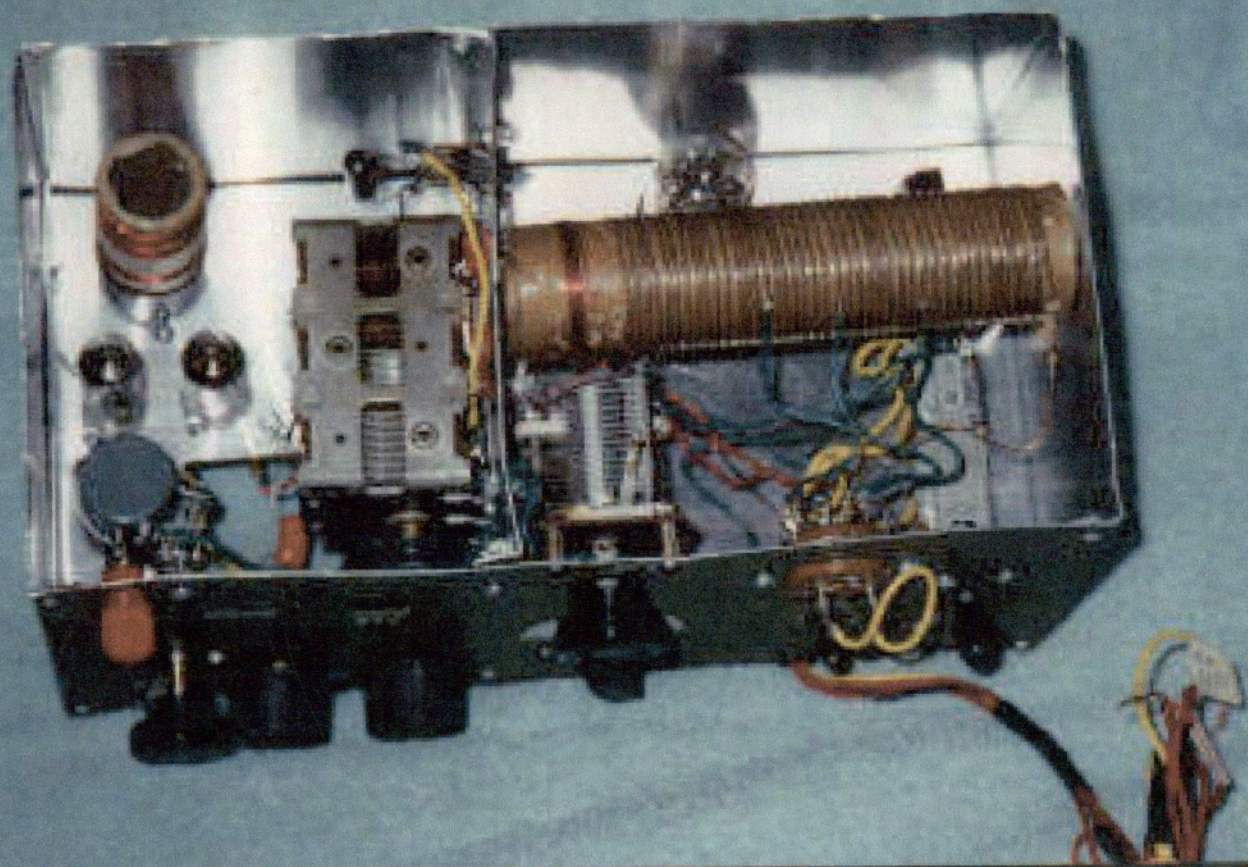
Small white paper label with illegible text.

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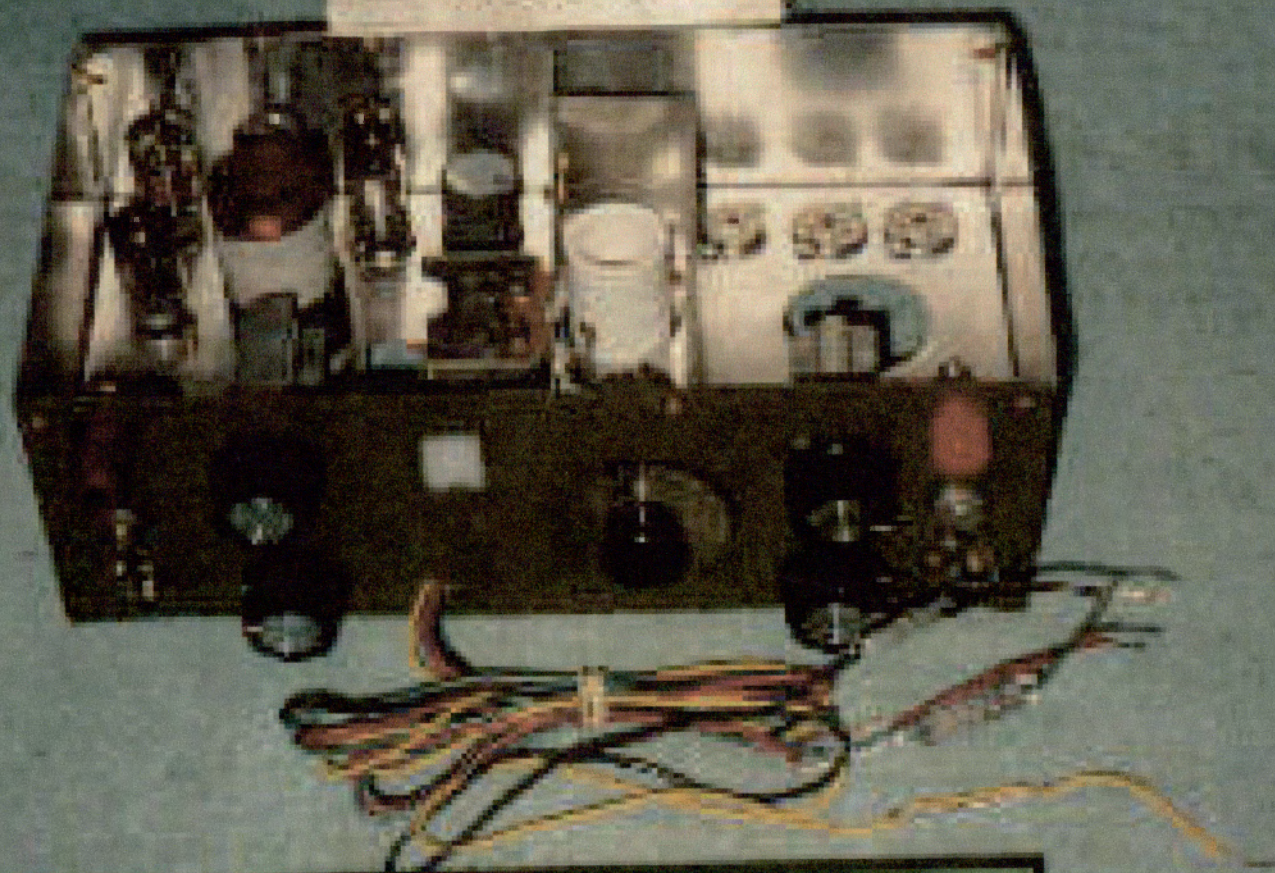




1943 KODAK SAFETY FILM



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VIET CONG HOME BUILT RADIO RECEIVER

# Viet Cong Home Built Radio

by LTC William L. Howard  
219 Harborview Lane  
Largo, FL 34640

In the early stages of the Vietnam conflict, the Viet Minh and later the Viet Cong were equipped with a variety of leftover WWII weapons supplemented by what they could fabricate in their underground factories. Communication equipment was also in short supply. This began to change and by 1967, the Viet Cong and North Vietnamese Army were equipped with sets made in China. The XD6, copied in part from the US WW II SCR694, the Mercury Talk Set which resembled a WWII Japanese set and the Type 63 backpack set which looked like an AN/PRC-10 mounted in a BC-1000 were among the sets that were captured. Occasionally, a Soviet radio would show up but these were few and far between.

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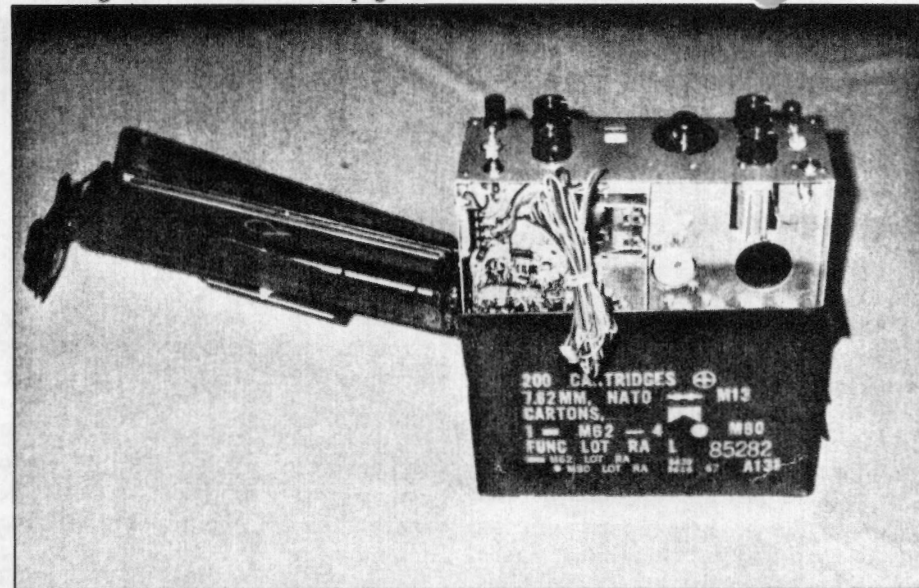
appeared to be a regenerative detector with a capacitor coupled amplification system. The resistors went either to a bus bar wire or were grounded to the chassis. The final stage was connected to an output transformer which seemed to be for the purpose of isolating B+ from the chassis. The transformer output was grounded to the chassis and a red wire went to the headphone socket.

I decided that it would make an interesting project to duplicate this set and see if it could be made to work. The original set was made from a series of panels held together by brass machine screws. I obtained an ammunition can and began the process of making a cardboard chassis. Side panels, back panel and front panel were then cut from alu-

minum. The center panel and shields were also cut from aluminum. A template for the center panel was laid out, after all the parts were assembled and a second template was made for the front panel. Finding parts that duplicated the original set was difficult. Subminiature tube sockets of the same color as the original were finally located as were other parts. Then the main chassis and all panels were taken to a local metal working shop where holes and cut-outs were done and the chassis was assembled.

The tuning capacitor was mounted on the center divider panel

and a local machine shop was contacted to turn a dial/drive pulley. Once the mechanical work was completed, the other components were mounted and the set began to take shape. The filaments were wired first, one lead to chassis and one lead to the main power switch. The chassis was A+ and B-. B+ was then wired to a bus bar wire and the output transformer was wired into the circuit. This set does not have a lot of room for wires and the lead to the headphone socket was buried under the other parts. The amplifier section was then wired. Resistors with proper values that resembled the original set were easy to find but capacitors were difficult. I used modern capacitors as I felt they were more reliable.



Completed set partially inserted into ammo can.

The detector portion was then wired and coupled to the amplification stages through an RF choke. Since I could not find a circuit for an RF amplifier that did not use a coil, I decided to eliminate the first tube. The coil was wound on an octal tube base with a cardboard insert and plugged into the socket. The set was powered up and nothing happened! I had a local collector go over the set and we reached the conclusion that the problem was in the detector circuit. After several further attempts to get the set operational I gave in and took the set to Don Dean in Sarasota who repairs old time radios. Don went over the set and finally got it to work. He rewired the coil and eliminated two stages of amplification. The end result was that a 1S5 tube was used for the detector and a 1T4 was used as an amplifier. In Sarasota, with a good antenna the set picked up 5 local AM Stations. In Largo it got three stations using a 30 foot copper wire antenna. The set now sits on the shelf as part of my Technical Intelligence Museum Displays.

Several conclusions were reached as a result of this project. The first is that the set could have been made much smaller and still put in an ammo can and there would have been room for batteries, head set and antenna. The second conclusion was that it would have been easier to use a long strip of aluminum bent to shape than to have made it from separate panels. Of course, the Viet Cong may not have had a long strip of aluminum and were forced to use small scraps for the chassis.

It is questionable if the original set ever saw service or was captured when U.S. Forces overran the underground factory. It is also possible that they could not get the original set to work which is why it was dropped and the other side was never wired. If anyone who reads this article has any thoughts on the use of the first tube ahead of the detector or the possible use of the unwired section, I would be interested to hear from them.

ER

## Communication Equipment of The North Vietnamese Army and the Viet Cong

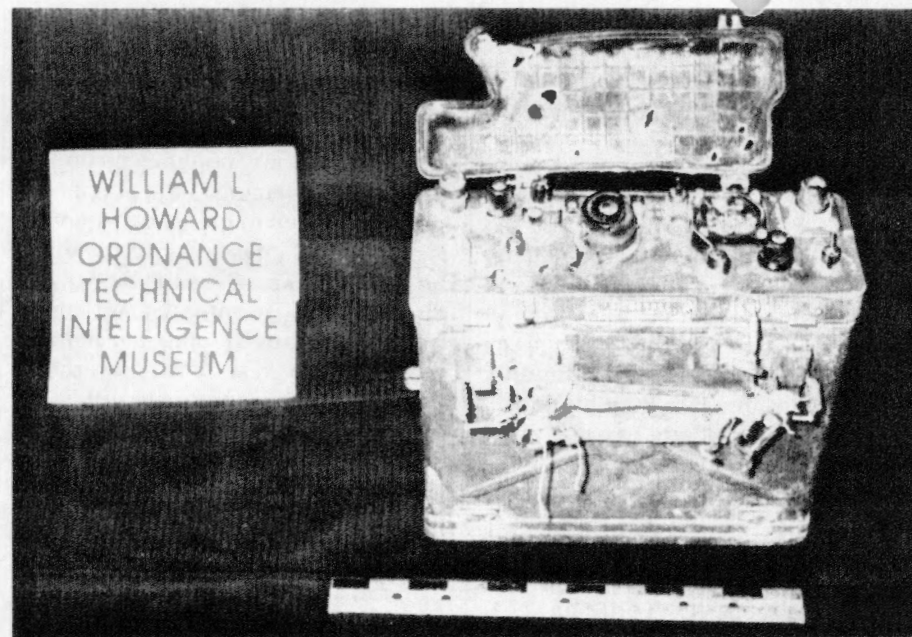
by LTC William L. Howard  
219 Harborview Lane  
Largo, FL 34640

In 1954 when the Geneva Agreements were signed ending the French-Indochina War, communications in both North and South Vietnam were in poor condition. Military equipment, much of it left over from WWII, was worn out. Since the French had handled both military and civilian communications their departure left the Republic of Vietnam with little equipment and no native expertise. On the other hand, North Vietnam inherited the resources of the victorious Viet Minh: experienced communicators and a battle tested military signal organization.

While the South Vietnamese laboriously rebuilt military signal units with the logistical and training support of American advisers during the late 1950's, the North Vietnamese interlaced their homeland with an austere, but comprehensive, communications network. By 1960 a powerful North Vietnamese governmental agency, the General Directorate of Posts, Telecommunications, and Broadcasting, had rehabilitated the old French wire network and installed radio-telegraph stations in every province. Encouraged by promises of aid from several Communist allies, North Vietnam then boldly embarked on an ambitious five-year modernization plan for telecommunications. The Communists intended to build a national microwave system, complete with automatic switchboards, to supplement the wire network. Automatic radio-teletype and voice radios would replace the existing radio-telegraph system, a slow, manual Morse net.

Although few of those hopes for modernization were actually fulfilled by the end of the five-year term of the plan, the optimistic outlook for North Vietnamese communications probably influenced Communist strategists meeting in Hanoi in September 1960 to consider whether the time was ripe to step up the insurgency in South Vietnam. They knew what prodigious demands such a campaign would make on North Vietnam's communicators. Reliable domestic communications to every province in North Vietnam would be essential in coordinating mobilization of the nation's resources and movement of men and material to the southern front. Since the insurgency was to be orchestrated directly from Hanoi, communicators also would have to establish extensive long-distance networks to meet the needs of both the Communist Party's political administration of an underground government in the faraway provinces of South Vietnam and the military's strategic direction of campaigns against the South Vietnamese Army. To support tactical operations within South Vietnam, the military and political cadres actually conducting the insurgency would require lightweight, easily concealed radios. Undaunted by those requirements for domestic, strategic, and tactical communications, the North Vietnamese in December 1960 announced the establishment of the National Front for the Liberation of South Vietnam.

Communist leaders tried to insist that the National Liberation Front was a popular uprising of South Vietnamese



The Type 63 manpack set was the newest item supplied by China. This set was probably intended as a replacement for the Model 71 B radio. It weighed 35 lbs., was 3 1/2" x 10" x 16" and was powered by a D-63 dry battery with taps at 3V, 27V, 90V and 178.5 Volts. It was estimated to be a 2 watt transmitter and covered 1.5 to 6 mc. Unlike the U.S. counterparts this set had a built-in key for CW operation. This set has 26 bullet holes in it.

nationalists displeased with Diem. Although the insurgents had a clandestine headquarters, called the Central Office for South Vietnam (COSVN), in a remote jungle area near the Cambodian border, doubtless Hanoi maintained direct communications with the communist bases throughout South Vietnam in addition to funneling strategic direction through the new field headquarters. Probably to relay communications from Hanoi to remote areas in the South, North Vietnamese communicators established a large communications complex at Dong Hoi about fifty miles north of the border with South Vietnam.

The oldest and most reliable strategic communications system available to the North Vietnamese was the clandestine communications-liaison network in

operation since the Franco-Viet Minh War along the Ho Chi Minh Trail. As infiltration increased in the early 1960's, communications-liaison took on increasing importance. By 1964 two communications-liaison battalions were handling strategic communications and infiltration along the trail.

To communicate general information, policy, and propaganda to South Vietnam, the North Vietnamese employed voice and telegraph radio broadcasting. The Vietnam News Agency, an operating arm of North Vietnam's General Directorate of Information, managed the activities of both Radio Hanoi, the official North Vietnamese radio network, and Radio Liberation, a clandestine station located in South Vietnam near the headquarters of the Central Office for South Vietnam. Much of the

Communication Equipment of the N. Vietnamese Army and the VC from previous page

broadcast equipment had been manufactured in the United States and captured from the French. Recognizing early the importance of undermining the South Vietnamese people's confidence in and allegiance to their government, North Vietnamese propagandists began beaming specially prepared programs to South Vietnam over Radio Hanoi soon after the division of the two countries. By 1962, when the South Vietnamese domestic broadcasting network comprised only fifteen small transmitters, all less than 25 kilowatts in strength, North Vietnam had ten 100-kilowatt transmitters and several relays in Cambodia beaming Radio Hanoi's signal throughout South Vietnam.

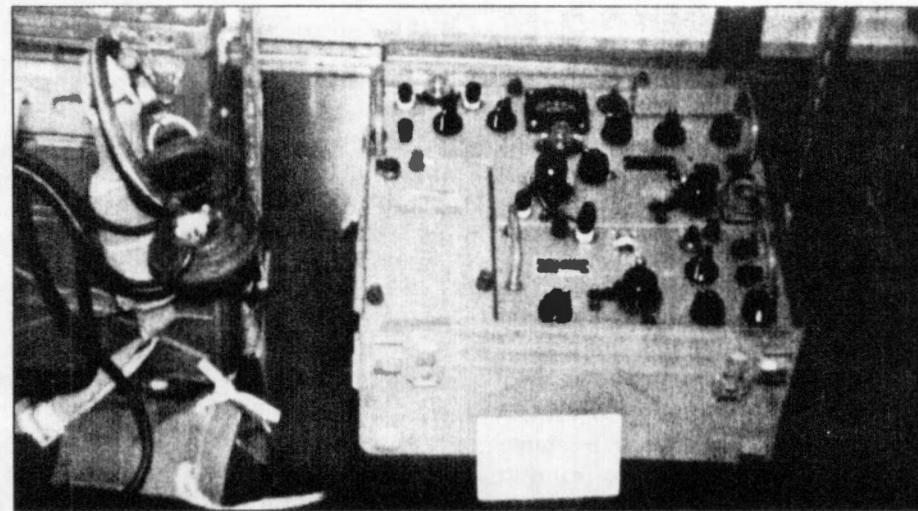
To maintain the facade that the National Liberation Front was a legitimate revolutionary organization existing independently of North Vietnam, Radio Liberation operated an international broadcast station; that transmitter, however, was located not in South Vietnam, but at the Radio Hanoi communications complex in Me Tri, a suburb of Hanoi. As Communist propaganda assumed an increasingly important role after the beginning of the Paris peace negotiations in 1968, the Me Tri complex grew to house twenty-three transmitters beaming broadcasts throughout the world in ten languages.

Of many special communications networks established as the insurgency accelerated during the early 1960's, one operated by the North Vietnamese strategic intelligence service, called the Research Agency, was the most comprehensive and active. To manage its covert operations in South Vietnam, the Research Agency used a combination of radio broadcast, courier, and radio-telegraph.

Organized into small cells of three or four agents with cover identities and false documents, the members of the Research Agency lived a seemingly normal life in South Vietnam while co-

vertly gathering intelligence on American and South Vietnamese military and government activities. Because the cell's communicator was the only one routinely to make contact with any member of the Communist movement outside the cell, he had to be especially careful to preserve his cover. The communicators required only a radio receiver, usually a common Japanese transistor radio, to receive missions and instructions broadcast directly from Hanoi. To avoid arousing any suspicion, a cell communicator normally left his radio in plain sight at his place of business or home and at a specified time, on an assigned frequency, listened for his instructions broadcast in Morse code and encrypted. Couriers handled outgoing communications to avoid exposing the cell communicators to radio intercept. If an agent had an urgent message to send to the Research Agency, such as news of an imminent bombing attack, the communicator brought the message to one of several clandestine transmitters hidden throughout South Vietnam for just such a use. As a result, U.S. and Allied Forces captured large numbers of transistor radios.

By the time the American air campaign against North Vietnam began, the Communists in South Vietnam, capitalizing on political and religious disension, were well established politically and had accumulated enough military strength through infiltration and recruitment in the South to challenge major units of the South Vietnamese Army. By late 1964 the Viet Cong had an army of 34,000 full-time guerrillas and about 100,000 part-time insurgents and sympathizers, and the North Vietnamese Army was moving several regiments into the northern provinces of South Vietnam. From its jungle headquarters northwest of Saigon, the National Liberation Front controlled a territorial governmental structure comprising five military regions. Forming a



One of the most often captured radios was the Chicom Model 102E which was manpacked or mounted in vehicles. This set was a copy of the U.S. AN/GRC 9 set with a few changes.

Communist shadow of the legitimate governmental hierarchy within each region, the Viet Cong established committees down to the provincial and sometimes even the hamlet level. By mid-1964 they controlled more than half of the territory in twenty-two of South Vietnam's forty-three provinces.

Even after the size of the Viet Cong organization grew unwieldy, leaders in Hanoi were reluctant to relinquish control of the insurgency to the National Liberation Front. They continued to attempt to disguise their direct involvement in Viet Cong operations and to perpetrate the myth that the National Liberation Front was conducting a popular rebellion. To control and coordinate the activities of Viet Cong and North Vietnamese Army units operating in critical areas of the northernmost region of South Vietnam, Military Region 5, the high command established National Liberation Front headquarters there.

Because of the protean evolution of the insurgency, there was little standardization of Viet Cong signal organizations or equipment. Most signal units

traced their origins to a single communicator serving as both radioman and messenger to a small Viet Minh cell during the 1950's. As the movement grew, so too did the communications organizations. In 1965 some uniformity in the organizational structure for communications began to appear: the Central Office for South Vietnam and Military Region 5 were each supported by a signal battalion, the other military regions and the infantry regiments all had organic signal companies, and provinces and battalions had signal platoons. Divisions of the North Vietnamese Army fighting in South Vietnam were supported by organic signal battalions. By late 1966 the Viet Cong and the North Vietnamese had approximately 150 combat battalions in the field under the command and control of thirty-two regional headquarters and seven divisional headquarters. Besides the organic signal units assigned at each level, that entire force was supported by three area support signal battalions.

Dictated by the needs of the war and by available resources, command relationships, signal configurations, and

Communications. Equipment of the N. Vietnamese Army and the VC from previous page  
organic equipment changed throughout the course of the conflict. Most communications units conformed to some type of tripartite organization - a battalion would have a radio company, a wire or telephone company, and a messenger company. Whatever the organization, the quality and availability of Chinese, Soviet, and captured American equipment usually dictated the actual capability of the unit. As the magnitude of the Communist military effort increased, new units assumed some missions of overburdened units. By 1972, for example, several signal battalions were supporting COSVN headquarters.

For a more thorough analysis of doctrine, training, and policy the reader should consult Chapter 16 of the book, *Military Communication, A Test For Technology*, by John Berger, from which the foregoing was extracted.

Let us now turn our attention to the tactical communication equipment used by the military forces of North Vietnam and the Viet Cong. By the mid-1960's the Chinese began to increase the amount of aid they provided the North Vietnamese. As a result the NVA was equipped almost exclusively with radios made in China and these began to move south into the Republic of Vietnam where they were eventually captured by U.S. Allied Forces.

The United States Army had several classified documents that dealt with foreign radios. The FOMCAT Foreign Material Catalogue (SECRET) and a small green book put out by USAEUR, the U.S. Army Europe, that dealt with Soviet radios. Therefore, we could not inform U.S. troops of these radios in an unclassified manner. We in Technical Intelligence did secure permission to write about them in unclassified format if the set was captured in South Vietnam. In July 1967, the only issue of the Technical Intelligence Bulletin was published by the Combined Material Ex-

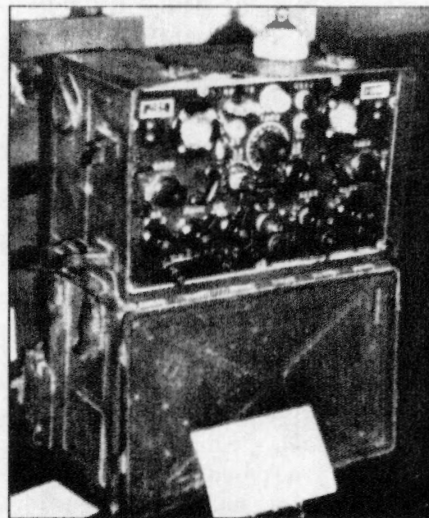
ploitation Center (CMEC). CMEC also had an extensive display of captured radios and other communication equipment and was on the briefing circuit for incoming intelligence personnel.

Telephone systems were not employed on any large scale and were usually used in the higher headquarters in secure areas such as Laos and Cambodia. Occasionally this equipment was captured by U.S. and Allied Forces. The main field telephone was the Chinese Model 0743, a copy of the Soviet TAI-43, copied from the WWII German field telephone. A Chinese 10-line cordless switchboard was the most commonly encountered item. There were also Yugoslav desk telephones, Polish storage batteries as well as captured U.S. EE8 telephones.

Routine administration and logistic matters were handled by couriers who carried recording tapes from point to point. Correspondence was put on magnetic recording tape which meant that a lot of material could be transferred in a small space. The most commonly encountered recorders were the small reel-to-reel sets that came out before the cassette recorders were on the market. Most of these recorders did not have a pinch roller and the speed of the tape across the recording head depended on where in the reel the tape was, the last portion usually going slower than the first part. In addition, the drain on the batteries was very heavy and as the batteries were worn down, tape speed slowed. It did give the VC a secure means of transmitting routine communications.

Radio communication was usually reserved for operations and intelligence with intelligence having the higher priority. Operations orders could be transmitted by courier but intelligence needed a faster means of transmission. There were several different types of radios in use by the North Vietnamese and the VC.

Among the radios that were captured



**The Mercury Talk is a high frequency, continuous range transceiver with a frequency range of 1.7 to 6.0 Megahertz (MHz). It was first manufactured in the People's Republic of China (PRC) in the late 1960's.**

were the Type 71B Radio Transceiver, which was a manpack AM radio which weighed 45 lbs. It covered 1.9 to 7.2 MHz and was 6 1/2" x 12" x 15". Power was provided by a D71 dry battery with taps for 1.5V, 7.5V, 90V and 150V.

One of the most often captured radios was the Chicom Model 102E which was manpacked or mounted in vehicles. This set was a copy of the U.S. AN/GRC 9 set with a few changes. The transmitter took up more space and the outer carrier, a metal chest housed the transmitter, receiver and a space for the D81 dry battery. The transmitter required a 641D hand cranked generator or a 964E dynamotor. The hand-cranked generator looked just like the U.S. versions but had a built-in voltmeter, an idea first seen in WWII Japanese generators. The set was a 15 watt set with a range of 75 miles, and covered 2-12 MHz. The complete set with accessories weighed 105 lbs. The receiver and transmitter alone weighed 38 lbs. This set was being re-

placed by the XD6 set which had the same technical characteristics.

The Type 139 radio receiver was a manpack AM set which could be interchanged with the receiver of the 102E set. It was contained in a thin sheet metal case with a snap-on battery case and had a switch for connection to an external battery. The set weighed 10 lbs. without the batteries and was 6 1/2" x 10 1/2" x 11" and covered 2-12 MHz. Power requirements were 1.5V and 90V. This set was known to be used by the Viet Cong.

The Chinese type 7512 Radio Receiver was an AM table model receiver that was well constructed but very heavy at 90 lbs. It was designed for fixed station use and operated on 110 or 220 volts. This set covered 1.5 to 25 MHz in 5 bands. Needless to say this set required access to commercial power or a portable generator.

The Type 63 manpack set was the newest item supplied by China. This set was probably intended as a replacement for the Model 71 B radio. This set looked like a copy of the U.S. WWII Walkie-Talkie but when the RT unit was removed from its case, it looked more like an AN/PRC 10. It weighed 35 lbs., was 3 1/2" x 10" x 16" and was powered by a D-63 dry battery with taps at 3V, 27V, 90V and 178.5 volts. It was estimated to be a 2 watt transmitter and covered 1.5 to 6 MHz. Unlike the U.S. counterparts this set had a built-in key for CW operation.

The other major Chinese set that had been captured by Allied Forces was the Chinese Type 601C Radio Transmitter. This was a high power set that was table or vehicular mounted. It weighed 45 lbs. and was 20" long, 8" high and 8 1/2" deep. The power requirement was 6 volts and 500 volts from a generator or dynamotor. This set was estimated to have a range of 75 to 2000 miles, again in the 2-12 MHz range with 3 bands and 6 preset crystals. Again, it was capable



### Communication Equipment of the N. Vietnamese Army and the VC from page 9

of voice and CW. This set was probably intended for communication between a major headquarters and Hanoi.

In addition to Chinese manufactured radios, there were Soviet generators, large Polish storage batteries and a host of small transistor AM sets from all over. In mid-1968 we recaptured an AN/GRC 9, a set from the 1950's that had been supplied to the South Vietnamese as part of the MAP - Military Assistance Program. It was captured by the VC and put into service on their side.

Soviet assistance in the area of radios was minimal. In late 1967, the 1st Cavalry Division Airmobile captured a Soviet R607 naval radio. It was captured while being landed from the sea. It never actually saw service in Vietnam. This was a huge setup, designed for installation on a ship or for a fixed base station.

The only known set of North Vietnamese manufacture was the VTS-2 Radio Receiver. It was contained in a square metal box. The set was 10" x 8" x 7" and used plug-in, tube-shaped coils. There were six coils, four were stored in the top of the receiver, and two were in use. It used ten D cells for power and covered 1.9 to 12.2 MHz. The use of D cells made it very easy to purchase replacements on the local economy, a prime consideration for an army whose supply lines, better known as the Ho Chi Minh Trail, went through miles of jungle and was subject to constant bombing.

In addition to these sets, the Viet Cong used a number of "homemade" sets. The set described in the 1967 T.I.B. was a CW receiver and transmitter housed in a 50 cal. ammo can, 6" x 7" x 11" and weighed 11 lbs. without the battery. It was a 2 watt set with a range of 20 miles covering 3.8 to 6.8 MHz. It required 1 1/2 volts for tube filaments and 90 volts and 150 volts for plate supply. It had a hand wound coil. (In a previous article I described the reconstruction of a VC homemade radio in a 30 cal. ammo can. This set was

not covered in the 1967 T.I.B. so I assume it was captured much later in the conflict.)

The technical intelligence bulletin was never updated or reissued during the course of U.S. involvement in Vietnam. By 1972 the CMEC was shut down and the units were returned to the United States. In 1975 D Co./519th Military Intelligence Battalion was transferred to Aberdeen Proving Ground and began to function as a technical intelligence unit. A new and updated Technical Intelligence Bulletin was issued in the late 1970's. Included in the new T.I.B. was the Mercury Talk Transceiver, examples of which were on display at the Signal Corps museum and at Aberdeen Proving Ground. It is assumed that examples of this set were recovered in Vietnam in the latter stages of the conflict.

The Mercury Talk is a high frequency, continuous range transceiver with a frequency range of 1.7 to 6.0 MHz. It was first manufactured in the People's Republic of China (PRC) in the late 1960's. The Mercury Talk incorporates independent manual tuning for the receiver and transmitter sections. This feature allows the operator to receive and transmit on separate frequencies simultaneously. The Mercury Talk may use either a whip antenna, which is connected to both the receiver and transmitter, or long wire antennas, which may be connected separately to the receiver and transmitter. Two 12 volt DC batteries are connected in series to power the radio. In addition, a 1.5 volt DC battery is used to provide illumination for the dial lights. The Mercury Talk measures 33.7 x 22.7 x 11.4 cm (13 1/4 x 9 x 4 1/2") and weighs 6.8 kg (15 pounds) with batteries.

The Mercury Talk may be operated in either the Amplitude Modulated (Voice) or Continuous Wave (Morse) mode. The radio has a power output of 2 watts and a transmitting range of 10-16 km (7-10

miles) in the voice mode or a power output of 3.5 watts and a transmitting range of over 160 km (100 miles) in the morse mode. There is no speaker incorporated in the Mercury Talk; therefore, a headset or external speaker must be used when operating this radio. The narrow frequency range of the radio makes it extremely susceptible to electronic warfare (EW).

The Mercury Talk is ruggedly constructed, easy to operate, reliable and completely transistorized. Solid state construction in the Mercury Talk reflects an advancement in the state of the art for PRC communications equipment. Compared to the U.S. Army's AN/PRC-74B, it is smaller and lighter, but it does not have the frequency range or the transmitting distance of the U.S. radio. Since the Mercury Talk is a continuous tune radio, it may be netted with U.S. AN/PRC-47 and AN/GRC-106 radios. The Mercury Talk is replacing older AM radios as part of an ongoing program to update communications equipment in the PRC Army.

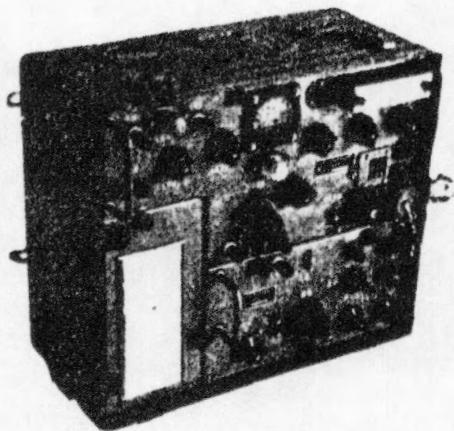
These sets were for the most part dismantled so the component parts could be photographed. The remaining chassis was sent to the scrap metal yard. As a result very few of these sets survived. In the 26 years since I left Vietnam, I have only encountered one Chinese field telephone and one Type 63 backpack radio. The Type 63 that I got was missing the battery box and all the accessories. This was not too surprising as the set had 26 bullet holes and was beyond restoration!

The NVA signal intercept units made extensive use of captured AN/PRC 25 sets to monitor U.S. radio traffic. U.S. operators were very careless in their operations and very verbose. As a result, many U.S. operations were disclosed in advance to the enemy. Once advanced knowledge of a U.S. operation was known, the intercept unit would use their 102 E or XD-6 set to

alert a higher headquarters and NVA troops in the area were warned and managed to escape. We bombed a lot of empty rice paddies and our infantry swept through many deserted villages as a result.

In summary, Chinese supplied radios were the backbone of NVA/VC communication. These sets were adequate for the task and while there is nothing remarkable about their circuitry or design, they are highly prized collector's items due to their scarcity. ER

## RADIO SET X-D6



DESCRIPTION: The X-D6 is a short range, man portable, amplitude modulated (AM) radio set. It was first manufactured in the People's Republic of China (PRC) in the early 1950's. The X-D6 has a frequency range of 2.0 to 12 megahertz. The transmitter may be continuously tuned over its entire frequency range, or six crystals may be installed to provide for six pre-set frequencies. The receiver has no pre-set channels. The set has two modes of operation, voice (AM) and continuous wave (morse code). Power for the transceiver is supplied by a hand crank generator; the receiver may be operated by using a dry cell battery, type D-81, or an external power supply.

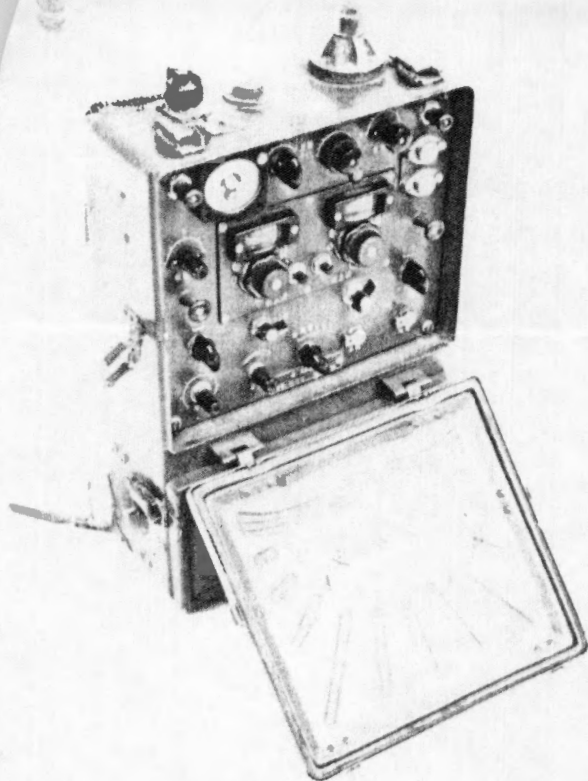
The X-D6 is usually operated with a whip antenna or long-wire antenna, but other types of antennas may be used. The radio set is housed in a waterproof aluminum case. The case has rings on the top and sides to attach a carrying harness, and a bracket on the left side to mount the base for a whip antenna. The weight of the X-D6, with accessories, is 32 lb (14.5 kg).

CAPABILITIES: The transmission range of the X-D6 is approximately 15 miles (24 km); however, the transmission range may be extended up to 100 miles (160 km) by the careful selection of a transmitting site and antenna. The X-D6 is designed so that the receiver may be operated separately from the transmitter. Additionally, the receiver and transmitter have separate tuning dials so that they may be operated simultaneously on different frequencies.

LIMITATIONS: In comparison to the latest PRC and US Army manpack radios, the X-D6 is extremely heavy and bulky. The X-D6 does not have a built-in speaker so a loudspeaker or headphone is required for operation. The X-D6 transmitter requires a handcrank generator for power. This means that besides the operator, another person is required to carry and crank the generator. Because of its power requirements, the set cannot transmit while it is being manpacked. In addition, the narrow frequency range of the X-D6 makes it very susceptible to electronic warfare.

REMARKS: The X-D6 is an old but ruggedly constructed radio, capable of extended field use with few electronic failures. The X-D6 is electronically a copy of the US Army AN/GRC-9, and many components, including electron tubes, are interchangeable. The X-D6 is not a simple radio to operate and special training must be given to the operator before he can use the set properly. The X-D6 is usually found at the platoon, company, and battalion level, but in some instances may be found as high as the regimental level. There are several US Army radio sets that operate within the frequency range of the X-D6 and may be netted with it, including the AN/GRC-9, AN/GRC-87, AN/GRC-19, and the AN/GRC-106. The X-D6 is still in use in the PRC's Army and found in several other countries in Southeast Asia.

## MERCURY TALK RADIO TRANSCEIVER



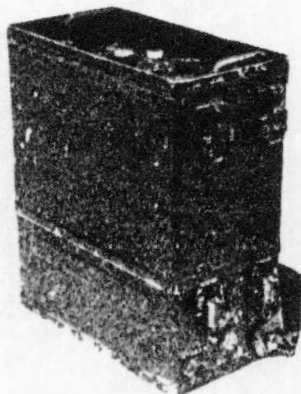
ITEM DESCRIPTION: The Mercury Talk is a high frequency, continuous tune transceiver with a frequency range of 1.7 to 6.0 Megahertz (MHz). It was first manufactured in the Peoples Republic of China (PRC) in the late 1960's. The Mercury Talk incorporates independent manual tuning for the receiver and transmitter sections. This feature allows the operator to receive and transmit on separate frequencies simultaneously. The Mercury Talk may use either a whip antenna, which is connected to both the receiver and transmitter, or long wire antennas, which may be connected separately to the receiver and transmitter. Two 12 volt dc batteries are connected in series to power the radio. In addition, a 1.5 volt dc battery is used to provide illumination for the dial lights. The Mercury Talk measures 33.7 X 22.7 X 11.4 cm (13 $\frac{1}{4}$  X 9 X 4 $\frac{1}{2}$  in) and weighs 6.8 kg (15 lbs) with batteries.

CAPABILITIES: The Mercury Talk may be operated in either the Amplitude Modulated (Voice) or Continuous Wave (morse) mode. The radio has a power output of 2 watts and a transmitting range of 10-16 km (7-10 miles) in the voice mode or a power output of 3.5 watts and a transmitting range of over 160 km (100 miles) in the morse mode.

LIMITATIONS: There is no speaker incorporated in the Mercury Talk; therefore, a headset or external speaker must be used when operating this radio. The narrow frequency range of the radio makes it extremely susceptible to electronic warfare (EW).

REMARKS: The Mercury Talk is ruggedly constructed, easy to operate, reliable and completely transistorized. Solid state construction in the Mercury Talk reflects an advancement in the state of the art for PRC communications equipment. Compared to the US Army's AN/PRC-74B, it is smaller and lighter, but it does not have the frequency range or the transmitting distance of the US radio. Since the Mercury Talk is a continuous tune radio, it may be netted with US AN/PRC-47 and AN/GRC-106 radios. The Mercury Talk is replacing older AM radios as part of an ongoing program to update communications equipment in the PRC Army.

## R-139 RADIO RECEIVER



**ITEM DESCRIPTION.** The R-139 is a lightweight, man-pack, amplitude modulated (AM) radio receiver manufactured in the People's Republic of China (PRC). The R-139 can be continuously tuned over a frequency range of 2-12 megahertz (MHz) and will operate with any type of antenna. The R-139 can be either powered externally or battery operated. When the receiver is battery operated, it requires a dry cell battery pack, type D-81. The entire unit is housed in a waterproof aluminum case, with a detachable carrying harness. The total weight of the R-139, with accessories, is 15 lb (6.85 kg).

**CAPABILITIES.** The R-139 can receive AM voice or CW (Morse code) transmissions and can be operated with the front cover open or closed. The receiver is used for monitoring command and warning nets or in split sites where radio transmitters and receivers are some distance apart.

**LIMITATIONS.** Like most radios in the PRC Army, the R-139 has no built-in speakers, so a headphone or loudspeaker is required to operate this receiver. Additionally, the R-139 is designed so that power is only applied to the receiver when the headphone or loudspeaker is plugged into the audio jack. Also, the narrow frequency range of the receiver makes it very susceptible to jamming.

**REMARKS.** The R-139 is an old, but well-constructed radio receiver which has the same electronic circuitry of the receiver portion of the US Army radio set AN/GRC-9/AN/GRC-87. It is bulky as compared to the current design of PRC or US Army man-pack radios, but it more than adequately serves the purpose for which it was designed. The R-139 is simple to operate, as it has a minimum number of operating controls. The R-139 will receive signals transmitted by several US Army radios including the AN/GRC-9/AN/GRC-87, AN/GRC-19, AN/GRC-106 and AN/GRC-26D. This receiver can still be found at almost any command level within the PRC Army and has been exported to several countries in Southeast Asia.

