

Appendix 1

EMERGENCY MEDICAL COMMUNICATIONS

ELECTRONICS IMPLEMENTATION PLAN -A

Summary by Russell R. Bateman

July 2, 1973 - This summary on the Emergency Medical Services Communications Electronic Implementation Plan (EMS/CEIP).

The EMS/CEIP is being conducted under the direction of Lionel Drage, Emergency Medical Services Coordinator and Mike Davis, Administrator of the EMS project. VHF FM equipment was placed and installed by the 130th Electronics Installation Squadron, Utah Air National Guard as directed by the EMS Coordinator and coordinated by the undersigned. With the exception of Payson, Utah Valley, American Fork and Tooele hospitals, equipment contracts for the hospitals have all been signed by the Hospital Administrator or a responsible authority on duty. The three hospitals in Utah County will be followed through with Clay Dalton who will contact the hospital administrators and will forward the signed contracts the first week of July.

The equipment was installed in 27 hospitals throughout the State of Utah, 22 of these hospitals are complete with frequency now operational checks. The remaining five units require some additional work before they will be operational. Thirteen mobile radios were installed in ambulances with four of the 13 requiring some additional work due to inoperative equipment. Installations of the hospitals required the mounting of the antenna, drilling holes and running heliax cable, fabrication of extension coaxial and power cables, installing and rearranging the TCXOs (crystals), installing the base stations, connecting the microphone and locating the base stations. The time required for each installation was three to eight hours by the two man Air National Guard teams. The installation of the ambulances required the two man teams from three to six hours for each ambulance. There were a total of three two man teams and one Air National Guard supervisor. The Mobile installation included the mounting of the transceiver, the control head, the speaker, running the cables and installing the antenna. Check out and frequency calibration required at each of the locations including the hospitals and the mobiles required from one to three hours depending on problems encountered. In addition, the training of on duty personnel required 15 minutes to one

hour depending on the questions and the interest of the local personnel.

The option of using my own pickup truck and trailer was selected for the reasons that there was a large amount of test equipment, installation hardware and spare parts required to be carried due to the support requirement of the three installations teams. The truck camper provided a portable work bench and test facilities that is required to remove the mobiles from the vehicles for frequency calibration and changing of the TCXO, and running sensitivity checks and other checks to insure that the unit is properly operating. Another advantage of the pickup truck was the sliding canopy which provided protection from the hot sun in southern Utah and also the rain that we encountered during the checkout of the Carbon County equipment. The canopy allowed the vehicle to be driven partly under the canopy of the truck and work could be made on the vehicle without getting into the element.

Summer means tourist season in southern Utah and motels were hard to find when you work from 6:00 a.m. to 10:00 p.m. as required to keep up with the installation schedule. The truck provided a place to sleep for each night when I was in the Salt Lake area except for one night at Price and one night in Roosevelt.

The following is a summary of the hospitals radio installed. Allen Memorial Hospital at Moab, Utah, installation was made on June 1973, serial no. MA514J. The inventory is no. 94748. This unit was equipped with one, two and three channel strapped for the operation on 155.280. The channel four is 155.340. Equipment was located in a small room next to the nurses' station. This hospital also had another transmitter with a pager located down in the 154 area.

The hospital radio at American Fork was installed. It was one of the two piece units. The installation was completed except we were short an antenna. After the antenna has been located and turned over to Clay Dalton who will try to get it installed and the remaining of the equipment operational. It is suspected that we have a problem with this two piece unit in that the cables or something is not compatible. We expect to refer this to Motorola for assistance. The base station will be installed in the same room that is presently housing the temporary police dispatcher for American Fork. That radio is working one Mile away. We hope there won't be any interference between the two transmitters. We don't have the serial number information tied down on that one yet but will add that supplementary information to this report when it is available.

Beaver Valley Hospital radio was installed in the main nurse's station. The serial number is MA515J. The inventory no. is 94750. The installation went quite smooth. It is possible to talk directly between the Panguitch, Milford and Cedar

Hospitals. Beaver hospital communications with Panguitch hospital is due to some unusual path going through the mountains.

Installation at the Carbon County hospital in Price was made in the emergency room in the corner. There is some question about the location of this transmitter. It doesn't seem to be convenient to be answered and it is questionable of whether there will be someone there at all times. I would suggest that this be reviewed in a few months to see if this is meeting the requirements. The equipment installed is MA364F, the inventory no. is 94081. This unit requires some additional check out to get operational. We had required a call back because initial tests didn't function properly. It is presently in good working order and is equipped with two channels, F1, 2 and 3 are strapped together on 155.280 and F4 is on 155.340. This was installed on June 27th.

The radio was installed on June 30th in the Cooley Hospital in Brigham City. Serial number is MA522J, inventory 94751. This radio has a high standing ratio and in checking out, we find the antenna is not properly located or not mounted as it should and will require another 4 to 6 hours for a team of men to go up and move the antenna so that we can make that unit operational. This unit should be able to talk with Tremonton and possible some of the Ogden hospitals.

A check on the Dixie hospital was made on 19 June. It was installed in the nurses' station, serial no. is MA509J, inventory no. 94753, installed with two crystals, 155.280 channels 1 through 3 and 155,340 on channel 4. Radio was installed at the nurses' Station.

Duchesne County hospital at Roosevelt, Utah, date of installation check was June 29th, serial MA361E', inventory no. 94083 equipped with two channels, F121 tied together on 155.280, channel 4 on 155.340. Roosevelt hospital has communications with Vernal.

Fillmore LDS Hospital, date of installation check was 23 June, 1973. Equipment serial no. MA511J, inventory 94755, 2 channels installed F133 tied together. Fillmore can contact Delta Hospital.

The Gunnison Hospital was installed June 22nd, serial no. MA516J, inventory no. 94761. Equipment was installed with two channels equipped, channels one through three strapped with 155.280, channel 4 with 155.340. Gunnison can communicate with Richfield and Mt. Pleasant.

Juab County Hospital, date checked out was July 1st. Serial no. MA512J,

Inventory no. 94757. Equipment installed with three channel units, F1 is the office emergency services repeater for emergency use only, transmit on 155.985, receive on 155.025. F2 and 3 are tied together with 155.280 and F4 on 155.340.

Kane County Hospital, Kanab, installation check was 19 June. Serial no. was MA363F, inventory no. 94085 installed with two channel elements, F1 through 3 strapped With 155.280 and F 155.340.

I suggest that the Director or Coordinator for EMS review this installation as time permits, its installed in the business office on the bookcase which is questionable to efficiency of the equipment in this location. It is also considered to be a hazard due to the heavy on top of the bookcase that does not look substantial.

Logan LDS Hospital, installation check out was 30th June, Serial no. MA517J, inventory no. 94758. Installed with F1 on the emergency services repeater channel 155.985 transmit 155.025 receiver. F2 and 3 are strapped together to 155.280 and F4 on 155.340. The Logan Hospital was selected as the other end of the Valley so to speak, for the test with the emergency services repeater. It is felt that tests will make a possibility for the Nephi Hospital to directly communicate with the Fillmore Hospital showing the outer extremes of the coverage of the repeater. It is thought that this capability of communications in the event of an emergency such as happened in the Payson and Box Elder area.

Milford Valley Memorial Hospital, the installation check was 23 June, 1973. Serial no. MA508J, inventory no. 94759. F1 through 3 strapped together for 155.280, F4 on 155.340. The equipment was installed and checked out to have an excess of 100 watts RF and the very minimum reflected power. However, in the operational check, it was found that about 6 miles north of Milford, contact was lost. It is suggested that we put some additional resources or effort into this reviewing the coverage first and with the possibility of adding a better antenna with a gain, particularly to cover the desolate area of 60 miles between the Milford and Delta area. Monument Valley Hospital installation check was 21 June, 1973, Serial no. MA520J, inventory no. 94760. Equipment was installed and checked out.

It was initially equipped with F1 through •F3 strapped together on 155.280 and F'4 on 155.340. It was recommended that the Director of EMS consider a pilot program be based around this particular hospital and relocate the base station to the top of the mountain behind the hospital with a gain antenna, possibly using the mobile with a DC supply charged by a float unit. From the remote control equipment down to the hospital, and that the radio be equipped in addition to the 155.340 on F4, be equipped with one channel on the Utah Highway Patrol frequency and one channel on the Arizona Highway Patrol and one on the Navajo

Indian Police frequency. This hospital is the only major hospital available to the Indians and serves a conservative large area of the Navajo reservation near the Four Corners area. It is felt that because of the interest of the local personnel and the good that it would do to the residents in the reservation as well as the San Juan Co. population in the southern part of the County, that it would certainly merit some consideration for special attention. A special control panel would be required to be engineered to change the four channels of the remote control unit.

Panguitch LDS Hospital installation check on 20 June, 1973, serial no. MA518J inventory no. 94756 equipped F1 through 3 strapped together on 155.280, and F4 on 155.340. Successful tests were made of coverage into the Red Canyon area which has been in the past somewhat of a dead area for the Highway Patrol and other people operating in that area. We also found it possible for the Panguitch Hospital to talk directly with the Beaver Hospital due to an unusual circumstance between the two cities.

Payson City Hospital, Payson, installation check was made on July 1st. The serial no. MA731B, inventory no. 94770 installed with F, 2, and 3 strapped with 155.280 and F4 with 155.340. The equipment did not check out due to some incompatible circuitry between the two units. This is one of the five two-unit transceivers to be checked out. It is felt that Motorola be required to come into find out why this equipment isn't compatible and operational.

San Juan Hospital installation checks 21 June, 1973, serial no. MA507J, inventory no. 94762, equipped with channels on F1, 2, 3 strapped with 155.280, F4 on 155.340. A coverage survey with this radio and covered a considerable distance north with the no-gain antenna.

Sanpete LDS Hospital, Mount Pleasant, installation check was made on 27 June, 1973, serial no. MA513J, inventory no. 94763, F1 through 3 strapped with 155.280 and F4 with 155.340. This hospital could communicate with Gunnison Hospital.

Sevier Valley LDS Hospital, installation check was made June 22nd, serial no. MA519J, inventory no. 94754. F1 through 3 strapped with 155.280 and P4 with 155.340. This hospital is able to talk directly with Gunnison. South Davis Community Hospital equipment is available, expected to be installed at the end of the first week of July. We weren't able to schedule it earlier due to some problems of finding out just where to locate the equipment This is one of the two piece units and we need some corrective information from Motorola before we try to put this particular unit on the air. Also, at the present time, the only antenna unit left is defective so it may be some time

before we come with an alternate antenna or the repair part to get the Davis Community Hospital in service but we hope to do it within the week.

Summit County Hospital, Coalville, installation check was made on June 29th, serial no. MA510J, inventory no. 94752, F1 through F3 strapped with 155.280 and F4 with 155.340.

Tooele Valley Hospital, Tooele, Utah has been installed. However, it is one of the two piece units and because of the technical problems we've had with the other two piece units, we have elected to wait out the checkout on that particular unit until we've had a chance to find out the problems with the two piece units.

Uintah Co. Hospital, Vernal, Serial no. MA362F, inventory no. 94084, installation date was 28 June, 1973. F1 through F3 strapped together on 155.280, F4 on 155.340. Vernal and Roosevelt hospitals can inter-communicate.

Utah Valley LDS Hospital, installation check was made on 1 July, 1973, serial no. MA730P, inventory no. 95061. This is a two piece unit. We were unable to get the transmitter operate properly. This unit will also be referred to Motorola maintenance on a priority basis. Due to the immediate need of the hospital, this will be given first attention.

Valley View Medical Center at Cedar City, installation check was June 18th. Serial no. MA506J, inventory no. 94754. Equipped F1 through F3 on 155.280, F4 on 155.340. We expected to install a tower but it hadn't arrived in time so temporarily we put up another method of installing it and we will replace it when the tower becomes available. Because of the size of the hospital and the remote area, it is suggested that it may be to the advantage of this hospital to have a gain antenna either furnished by EMS or by the hospital itself and to be installed by the Air National Guard.

Wasatch Co. Hospital, Heber, date of installation checks 29 June, 1973. Serial no. MA359F, inventory no. 94082, equipped F1 through F3 strapped together, 155.280; F4 155.340.

Weber Memorial Hospital at Roy, Utah. We didn't have enough equipment to make this installation but we did install an antenna on the transmission line so most everything is ready except for the base transceiver. It should take just a short time to make the installation when the equipment becomes available. West Millard Hospital at Delta, Utah. Date of installation check was June 23rd, serial no. MA523J, inventory no. 94756. F1 through F3 strapped together for a 155.280, F4-155.340. This hospital has communications with the Fillmore

Hospital.

We are presently shuffling some of the mobile radios and exact serial numbers and other recommendations will come at a later time as a supplement to this report. However, we will receive the installation area of the ambulances.

The ambulance at St. George and Cedar City are 1965 Cadillac and a 1966 Oldsmobile. These two ambulances are not radio equipped. They do have a radio equipped 1970 Ford Van some times used as an Ambulance. Presently, it has F1-155.505, F2-155.655, F3-155.745, F4-155.220. If this ambulance radio is to function on hospital frequencies, it will probably require the EMS to furnish the TCXO. The ambulance owners should be encouraged to add that at least one or the other ambulance should also be equipped with radios because in the Cedar City area, the requirements exceed the use of the one ambulance.

The ambulance Radio at Kanab had some troubles and we had to bring that radio back for some work.

Monument Valley ambulance requires some additional shuffling that it is designed to work on F1, 155.505; F2, 155.655, the area police frequency is planned for the area; F3, 155.280. F4, 155.340 will be equipped.

In Mexican Hat, additional work is required and that should be operated similar to the Monument Valley ambulance. The ambulance in Mexican Hat is owned by the Mexican Hat city.

The ambulance in Bluff is an RCA which was purchased some two years ago which was installed by the Air National Guard.

The ambulance at Blanding, Utah is a Cadillac. This ambulance as well as the one at Bluff is owned by San Juan County. It also had an RCA for some period of time and had not had it installed. The San Juan County at Monticello had an EMS radio installed as part of the CEIP, and the ambulance at Moab belonging to Grand County was radio equipped. The Moab ambulance was in the paint shop and the radio had to be installed and checked out under very dirty and hot conditions. We had a few problems in it but was able to get the radio operational. The antenna on this radio should be rechecked at a later date. The Green River ambulances are owned by the Green River Fire Dept., one was a fairly recent model Pontiac and the other one was an older 1959 Buick. These ambulances are said to be the heaviest used ambulances in the State. The Pontiac had a RCA installed in it but looking forward to the use of adding the encoders, we removed the RCA from the Pontiac and put it in the Buick and installed an EMS Motorola radio in the Pontiac. Mitchell

Mortuary in Price has a 1962 Pontiac, a 1965 Cadillac and a 1973 Cadillac. In Price, they indicate that they have GE radios for these particular units. However, it is questionable as to what their plans are. Suggest the emergency medical coordinator review with them to be sure that we do get the radios with the proper crystals installed in these units. The Gaussett Mortuary in Castledate, Utah received a EMS radio in their ambulance. Installed in this radio is F1-155.505, F3-155.280, F4-155.350, it is recommended that we add the VHP area frequency in channel two and the sheriff's repeater in channel three and removing the 155-280. The Gunnison Hospital ambulance located at the hospital in Gunnison has an older Pontiac ambulance, equipped with Motorola radio. It requires a TCXO to be added for the 155.340 frequency. Now equipped with the 155.505 channel one, 155.595 in two, 155.745 in channel three. Beaver Valley ambulance at Beaver received a new EMS radio. The transmitter was defective and was returned back to the Utah communications for repair. Milford ambulance has a 1954 Chevrolet in good condition, has an RCA unit in it, does require TCXO's to be added for the 155.340 and is hoped that they can be obtained from RCA under the original contract. This unit belongs to Milford City.

Milford County purchased for Delta and Fillmore two new 1973 Cadillac's. We added an EMS radio at Fillmore. It is planned to change the RCA radio out of the older Pontiac into the new Cadillac at Delta.

Sanpete ambulance at Mount Pleasant Hospital had an RCA that is equipped with F155.505, F2-155.100, F3-155.745 and strangely enough, there were some crystals available in the drawer of 155.340 and so they were installed and checked out.

The city ambulance at Sunnyside, Utah had a Motorola radio installed under this program; however a review of the ambulance found that it already had been radio equipped, so we removed one of the Motrack. The existing Motrack owned by the city has 155.505, 155.655, 155.745, and we did install the 155.340. We will provide assistance to the city for ordering the crystals on 156.210 and they have the crystal on 155.340 to work with the county sheriff's repeater.

The Uinta County ambulance in Vernal, Utah privately owned, however, is subsidized by the county and always is parked at the County Courthouse is a Dodge van in good condition. We installed a Motrack in the ambulance 155.505, and strapped F1 and F2, F3-155.280 and F4-155.340. The Tremonton city fire department ambulance in Tremonton requires an RCA TCXO for 155.340 and will have to be bought outright because they have about filled in the four channels. They have agreed to pull out one channel, probably 745 155.745 to make room for the hospital channels. In addition to these, we have radios for installing to other two or three ambulances, but are short the 155.340

TCXOs. We will go ahead and take two of the priority ambulances and try to have the Air Guard work on these the first week end in July. In summary, some of the general recommendations that can be made by the undersigned are several. It was noted that throughout the state there are ambulance radios acquired under different programs, some under the State Board of Health, some purchased by the counties and cities, some purchased outright by civic organizations and then there are the units purchased under this emergency medical program. It is recommended that the state EMS coordinator take on the project of providing guidance to these ambulance owners for the frequencies to be included in the ambulance particularly in the development program 155.340 and any encoding or decoding requirements on ambulances. They have complained that they haven't had guidance as to just which way to go and how to order crystals or just what they should do.

In many cases, we have found radios sitting in closets and have been there for a period of time with no one giving the guidance as to how or where they should be installed. It was also recommended that the 155.340 be used as a calling channel, and then after they contact the hospitals when they move to 155.280 for their inner hospital traffic, by not putting this traffic on the 155.340 channel where there may be some interference between one hospital and another. I suggested that a complete set of fuses be purchased by EMS and located in a plastic bag or whatever and attached to each set of radios because in these remote areas we have found that these fuses are in most cases just not available. Following sites should be reviewed for the possibility of installing gain antennas - Monument Valley, Cedar, Panguitch, Milford, St. George and Price. In the future, work will be required to reworking the installations for improving them. The additional mobiles to be received would be in an area of about 18 to be installed yet as directed by the EMS coordinator. As the TCXOs are acquired, there will need the TCXOs to be installed in the base stations and the mobile units. Also consideration should be given to other mobiles, part of this program because if we don't finish them under the EMS Project, it is doubtful that many of the ambulances owners will purchase the 155.340 channel elements for some time. It is recommended that the decoders and encoders be reviewed again, that the digits be strapped down for three digits in place of the seven digits with a future possibility of looking at the tone requirements. Also, it is heard that Colorado may be on touch tone instead of the digital system and we would have to relook at the requirements for Moab and Green River ambulances for touch tone system for the Colorado hospitals.

My office of Emergency Services got good publicity of me coordinating this project; I took vacation time from the State and did not receive any money compensation from anyone. The fuel for my pickup was paid for by the Robert Wood Johnson Foundation.

This turned out to be a good decision as Utah Communications filed suit agensed the State of Utah as they believed that they should have had the contract. I was told that the plan that they submitted only would have covered one Hospital using the total funds. The

govenors investigation foun that there were no State Fund in the project. It was entirly funded by Priviate funding byh the Robgert Wood Johnson Foundation.

Russell Bateman
