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	U·S·DEPARTMENT OF THE INTERIOR OFFICE OF SURFACE MINING RECLAMATION AND ENFORCEMENT DIRECTIVES SYSTEM	Subject Number: ADS-5 Transmittal Number: 127 Date: 8/17/82

Subject: RADIOCOMMUNICATION SYSTEM

Approval: [signature] Title: Director

1. Purpose. This directive prescribes the procedures for standardization and operation of the Mobile Radiocommunication system within the Office of Surface Mining (OSM).

2. Definitions. See attached OSM Radiocommunications Handbook.

3. Policy/Procedures.

a. Concept. OSM operates a two way mobile radiocommunication system in the seven (7) State area of Pennsylvania, West Virginia, Maryland, Virginia, Kentucky, Tennessee and Alabama. This system is designed primarily for use by OSM State Offices for Mine Inspection, Management and Safety. The system is also available for use by personnel of the Eastern Technical Service Center (ETSC) when operations are conducted in the area serviced by the radio system. The system consists of mobile units in vehicles, portable units, control stations (located in State and Field Offices of the six States) and a series of repeaters throughout the designated States in such locations as to provide maximum area coverage. It is OSM's policy that all personnel operating the mobile radio system comply with the provisions of this directive and exercise good radio procedures.

b. Responsibilities.

(1) State Office Directors. In conformity with Departmental Manual (DM 313) and OSM guidelines, State Office Directors in the States operating the OSM radio system will:

(a) Prepare frequency applications to OSM Branch of General Services for assignment of radio frequencies and radio call signs as appropriate.

(b) Maintain liaison, as required, with OSM Headquarters in matters relating to the radio system.

(c) Insure that the necessary guidance, instructions and training for the operation of the radio system is provided to OSM users.

(2) Radio Frequency Authorization Requests. To operate any OSM radio system, a Frequency Assignment Authorization must be approved and on file with each base station. Frequency assignments are required for each base station and repeater location. Frequency Assignment Requests (Form DI-800) shall be submitted for each new installation and for changes to existing stations. A copy of the authorization for the Base Station and each repeater controlled by that station shall be posted at the Base Station location. The Frequency Assignment Authorization becomes the license to operate the station. Frequency Authorization Requests will be prepared in accordance with instructions contained in Attachment 1 and forwarded to the OSM Radio Liaison Officer (Chief, Branch of General Services).

(3) System Maintenance. Since OSM does not have its own radio maintenance personnel, it is necessary to contract for radio maintenance with local mobile radio shops. State Office Directors and ETSC Administrators will submit a Requisition Form to the Branch of Procurement requesting yearly maintenance of all radio equipment under their jurisdiction (base stations, repeaters, mobile units, touch tone pads, etc.) The Requisition Form will recommend an appropriate service shop based upon a survey of mobile radio shops within their area and the ability of the shop to respond to requirements. Because of the various locations of equipment within a State, State Office Directors may opt to utilize several vendors to service certain areas in the State. For example, Kentucky may require a vendor for Western Kentucky and two (2) to three (3) vendors for Eastern Kentucky depending on the tie in between base stations and repeaters in the Eastern Kentucky area.

(4) Training. Generally, training can be conducted in-house with the assistance of the vendors supplying radio maintenance. Requests for additional training assistance shall be addressed to the Assistant Director, Management and Budget.

4. Reporting Requirements. None.

5. References.

   a. DM 313, Radiocommunications.

6. Effect on Other Documents. None

7. Effective Date. Upon issuance.

8. Contact. Division of Management Services, Branch of General Services, Telephone, FTS 343-6315.

October 25, 1978
Attachment 1

PREPARATION OF DEPARTMENTAL FORM DI-800
REQUEST FOR RADIO FREQUENCY ASSIGNMENT

A separate DI-800 is to be completed for each frequency requested for a station (or group of mobile stations in a system), except a single DI-800 should be used to request assignment of a band(s) of frequencies established for ship or aircraft stations; e.g., the aeronautical VHF communication bands, maritime bands established for specific types of service.

Both pages of the form are to be completed. Abbreviations should not be used except as necessary because of space limitations on the form. Spaces provided on the form that are not appropriate for a particular type of assignment request are to be completed by inserting "N/A."

The DI-800 is to be prepared using the following instructions.

1(A) Bureau. Enter the name of the requesting Bureau or Office; Bureau of Mines, Bureau of Indian Affairs, etc.

1(B) Office or Activity. Enter the office, unit, or activity requiring the assignment; e.g., Yellowstone National Park, Colorado River Storage Project, Brown Valley National Wildlife Refuge, etc.

1(C) Sub-Bureau Designator. Enter the sub-Bureau designator as establish for the applicant Bureau as follows:

- A American Samoa, Government of
- E Mining Enforcement and Safety Administration
- G Geological Survey
  - GC Conservation Division
  - GG Geologic Division
  - GT Topographic Division
  - GW Water Resources Division
  - GZ Not elsewhere classified
- I Indian Affairs, Bureau of
  - IA Aberdeen Area
  - IB Anardarko Area
  - IC Billings Area
  - IE Juneau Area
  - IF Minneapolis Area
  - IG Muskogee Area
  - IH Phoenix Area
  - IJ Sacramento Area
  - IK Central Office (Washington, D.C.)
  - IM Albuquerque Area
  - IN Navajo Area
  - IP Portland Area
  - IS Eastern Area
  - IZ Not elsewhere classified
- L Land Management, Bureau of
- M Mines, Bureau of
- OSM Office of Surface Mining

Requests for modification of an assignment are to be completed in the same detail as requests for new assignments. On Page 2, Item 7, Remarks, summarize the assignment particulars that are being modified.

A request for assignment modification is required whenever the operational use of a frequency is to be in a manner not provided for by the existing assignment. For example, change in station location, area of mobile operations, transmitter power, type emission, antenna system, points of communication, etc.

4 Transmitting station particulars. Spaces (A) thru (V) are for tabulation of data that relates to the station's transmitting facilities, including those of mobile/portable stations.

4(A) Frequency. From the following, select and use the instructions which best apply for specifying the required frequency:

(1) Specific frequency: If a specific frequency is desired, list that frequency.

(2) Frequency band. If the assignment of a specific frequency is not required — but an assignment in a particular band is desired — list that band, e.g., 30-42 MHz, 162-174 MHz, 406-420 MHz, etc.

(3) Single sideband. List both the carrier frequency and the frequency to be assigned. Indicate the carrier frequency in parentheses.

(4) Survey equipment and radar. Certain types of survey equipment and radar are designed so that they must be authorized to operate within a limited band of frequencies. Enter the band, e.g., 2900-3100 MHz.

(5) Ship stations. Enter the ship frequency band designator, e.g., BAND J. Also enter the length and tonnage of the ship.

4(B) Reserved.

4(C) Name of transmitter location. Enter the name of the location where the transmitting antenna will be physically located. The name used should be the name for that location as it appears on maps issued by the U.S. Geological Survey. When available maps do not identify the location by name, use the common local name for the site. Do not abbreviate. For example, Parker Dam, Seattle, Red Mountain, South Entrance Yellowstone Park, etc. When the site has no name, identify it in relation to the closest named site.

e.g. 3 mi. south, 4 mi. east of Bend, Oregon
1/2 mi. north of Cottonwood pass

For mobile/portable operations see 4(H).

The unique system name or designator shall consist of not more than eight alpha or alpha-numeric characters and should, as nearly as possible, relate to or identify the activity, project or area for which the frequency assignment is required; e.g., Colorado River Storage Project--CRSP, Fish Creek Wildlife Refuge--FISH CR. (Note: The name of a State by itself is not acceptable, except for certain systems of the Bureau of Land Management.) The Department's communications engineer may alter the proposed system name, if the proposed name has already been assigned to another system within the Department of the Interior. In other words, each system within the Department must be identified by a unique system name.

Note. A system is defined as follows:

(1) A multiplicity of stations which intercommunicate within a network.

Examples: A point-to-point circuit or group of such circuits, a microwave system, and integrated land mobile system.

(2) A station, or group of stations, which performs a given function under a single operational and administrative control.

Examples: A ship-shore service, a given category of field operations using mobile or portable radio equipment, a broadcast service.

4(K) Call sign. Enter "Requested," if the assignment request is for a station not presently assigned a call sign. If a call sign is presently assigned to the station or a station operated by the applicant at the same location list that call sign.

4(L) Class of station, type of emission, transmitter power. An assignment request must designate the class of station to be operated, the type of emission from that station, and the transmitter output power for that emission.

For the same frequency, more that one class of station or emission and related transmitter power may be specified on a single assignment request. However, for each class of station entry there must be a related emission and power entry. Also, for each type of emission entry there must be a class of station and transmitter power entry. For example:

Class of Station	Emission	Transmitter Power
1. FB	16F3	90
ML	16F3	50
2. FXH	16F2	25
FX	16F3	25

MA -- Aircraft Station: A mobile station in the aeronautical mobile service on board an aircraft or an air-space vehicle.

ML -- Land Mobile Station (typically vehicular and portable radio stations).

MO -- Mobile Station: A station in the mobile service intended to be used while in motion or during halts at unspecified points.

MR -- Radiolocation Mobile Station: A station in the radiolocation service intended to be used while in motion or during halts at unspecified points.

MS -- Ship Station: A mobile station in the maritime mobile service located on board a vessel (ship), other than a survival craft, which is not permanently moored.

(2) Type of emission. Enter designator for type of emission. Typical emission designators are as follows:

16F3 -- Conventional Narrow Band FM Voice.

6A3 -- Double Sideband AM Voice.

3A3J -- Single Sideband AM Voice, Suppressed Carrier.

M25F9 -- Multichannel Microwave, 25-MHz Necessary Bandwidth.

Note: The emission designator consists of the following:

(a) Necessary bandwidth. The first three significant figures designate the necessary bandwidth.

(b) Modulation. A letter is used to designate the type of modulation of the main carrier:

A Amplitude
F Frequency
P Pulse

(c) Type of transmission. A number is used to designate the type of transmission:

0 Absence of any modulation intended to carry informatio
1 Telegraphy without the use of a modulating audio frequency

(2) Radars and certain experimental stations. Additional information may be required besides the manufacturer's name and model for radars and certain experimental stations. Consult the communications engineer prior to committing funds or resources.

(3) Multiplexed equipments. Enter after the manufacturer and model, the number of multiplexed channels by type of service provided. For example, "120 channels — 48 voice, 62 control, 10 spare."

4(N) Special coordination. Answer if station is to be located in an area requiring coordination by checking yes or no.

(1) The operation of Government stations in certain frequency bands in specific geographical areas may not be permitted or may require coordination prior to frequency assignment to protect major receiver installations.

Stations to be installed in the following areas are to be coordinated with the Department's communications engineer prior to commitment of funds for the installation.

Virginia/West Virginia. The area within 37°30'N to 39°15'N and 78°30'W to 80°30'W.

Arizona (Ft. Huachuca). The area south of 33°N between 110°W and 113°30"W.

North Dakota (406-420 MHz). The area north of 47°48'N and between 96°31'W to 99°17'W.

Colorado. The area between 39°54'N to 40°17'N and 105°03'W to 105°26'W (and any station within 40 miles of this area where the effective radiated power is 25 Kw or more).

(2) Radio astronomy observatories are protected against the use of frequencies in the band 406-410 MHz in the following areas. Frequencies in this band in protected areas usually are not considered for use. Any essential use must be coordinated following instructions given in Chapter 2, paragraph .12 of the Departmental Handbook. The areas are as follow:

Arecibo Observatory (Puerto Rico) — the area 17°30'N to 19°N and 65°10'W to 68°W.

Five Colleges Radio Astronomy Observatory (New England Area) — the area 41°40'N to 42°50'N and 71°20'W to 73°20'W.

(2) Nondirectional. ND (Nondirectional antennas)

(3) Steerable. S (Directive antennas that operate in a fixed mode (direction) but are steerable in the horizontal plane; e.g., steerable log periodic.)

(4) Rotating. R (Antennas rotating through a full 360° azimuth while in operation.)

(5) Scanning horizontally. SSH (Antennas scanning horizontally through a limited sector.)

(6) Scanning vertically. SSV (Antennas scanning vertically (nodding)).

(7) Tracking. T (Antennas capable of continuous reorientation for the purpose of maintaining optimum observance of a moving station or object.)

Polarization. For frequency assignments above 1000 MHz leave one space after antenna orientation and enter one of the following code letters to describe antenna polarization.

H	Horizontal
V	Vertical
D	Rotating
F	45°
E	Elliptical
R	Right-Hand Circular
L	Left-Hand Circular
S	Horizontal and Vertical
T	Right- and Left-hand Circular
X	Other

e.g. 352 V (Antenna oriented at 352°, vertical polarization)

4(R) Elevation. Enter the following:

(1) Site above MSL. Elevation above mean sea level at transmitting antenna site; e.g., 3275 Ft.

(2) Antenna above ground. Height of transmitting antenna above ground level at the site; e.g., 35 Ft.

Note: Do not complete this space for antennas operating below 30000 kHz.

4(T) List receive frequencies. Enter those frequencies that are or will be received at this station which are operationally related to the transmitting station described above. For example, repeater receive frequency, link control or link repeater receive frequencies, net receive frequency, etc.

5(C) Latitude and longitude. Enter the geographical coordinates in degrees and minutes for the receiving station antenna site named in 5(A).

e.g. 4332N 10927W, or if known to the second,
433214N 1092653W

5(D) Call sign. Enter the call sign assigned to the station receiving transmissions from the transmitting station described on Page 1 of the assignment request. If this call sign is to be assigned enter "Requested."

If the receiving station has no associated transmitter, hence no assigned call sign, enter "R-only."

5(E) Antenna gain. Enter the gain in dB (decibels), as specified by the manufacturer, for that antenna used at the receiving station.

Note: For antennas operating below 30000 kHz with less than 6 dB gain indicate "X."

5(F) Generic type name of antenna. Enter the generic or basic family name for the type of antenna used at the receiving station. For example, Corner Reflector, Yagi, Coaxial, Collinear, Ground Plane, Parbolic, Log Periodic, Helical, and as a special case Passive Reflector. Do NOT use terms such as Directional, Omni-directional, and Cardioid. If necessary, give the manufacturer's name and antenna model number.

Note: Do not complete this space for antennas operating below 30000 kHz.

5(G) Elevation. Enter the following:

(1) Site above MSL. Elevation above mean sea level at the receiving station antenna site.

(2) Antenna above ground. Height of receiving antenna above ground level at the site.

Note: Do not complete this space for antennas operating below 30000 kHz.

5(H) Antenna orientation. Enter one of the following codes or the appropriate antenna azimuth.

(1) Directional. For directive antennas oriented in a fixed direction, enter the three digit number indicating the azimuth of the main antenna lobe in degrees east of True North, using 360° for True North.

Passive Reflectors. For stations using on-site passive reflectors, displaced vertically from the primary antenna or installed on the same antenna farm as the primary antenna (normally within 500 feet of the transmitter), enter the horizontal azimuth of the on-site passive reflector.

5(I) Repeaters. Enter the 5(A) line number for any station that functions as a repeater, control repeater, link repeater, etc. Also, indicate the transmit frequency for the controlled transmitter (repeater transmitter).

e.g. Line 3, RPT TX 173.375 MHz

Line 5, RPT TX 408/625 MHz

5(J) Other systems and equipment nomenclature (receiver).

(1) Other systems. Enter the 5(A) line number for any receive station that is a part of another system. Also, give the name of the "other system" and the operating agency. If the receive station is a part of a non-Federal Government system, indicate "NGOVT."

e.g. Line 2, CRSP, Bureau of Reclamation

Line 3, Montana State Patrol, NGOVT

Line 5, Army

(2) Equipment nomenclature (receiver). Following instructions given in 4(M) for transmitter equipment nomenclature, enter the appropriate receiver equipment nomenclature for each receive location identified in 5(A).

6 Justification for assignment. Each assignment request must include a justification statement including, explicitly, how the proposed assignment will be used and why it is needed. Explain why commercial radio or wire line facilities cannot be used to support the requirement.

7 Remarks. For use by the applicant to expand on any special features or requirements of the assignment.

8 System drawing/schematic. Assignment requests shall be accompanied by a system drawing/schematic showing and identifying (a) all stations within the system, (b) the frequencies used at each station, (c) the type of stations (e.g., base, repeater, link base, link or control repeater, etc.), (d) remote control facilities, (e) special switching or interconnect into other systems, and (f) normal points of communication for each station.

(1) For new systems employing more than two base or fixed stations, or a single base or fixed station and a repeater station, a system drawing/schematic is required.

(2) Assignments for additional stations in an existing system or for a change of frequency at stations in an existing system, a revised system drawing/schematic is required.

FORM DI-000
REVISED OCT. 1973

UNITED STATES DEPARTMENT OF THE INTERIOR

REQUEST FOR RADIO FREQUENCY ASSIGNMENT

Submit original only to Communications Engineer (transmittal memo not needed).
Refer to Part 313, Chapter 10, *Departmental Manual* for additional instructions.

DATE

TO – COMMUNICATIONS ENGINEER, TELECOMMUNICATIONS STAFF OFFICE, AMO, OFFICE OF THE SECRETARY
U.S. DEPARTMENT OF THE INTERIOR, WASHINGTON, D.C. ZIP CODE 20240

(A) FROM (Bureau)	(B) OFFICE OR ACTIVITY	(C) SUB-BUREAU DESIGNATOR
1.		

2. ASSIGNMENT REQUIRED FOR: (A) REGULAR OPERATION:_____, (B) TEMPORARY OPERATION ENDING _____, 19____

3. TYPE OF ACTION: (A) NEW_____, (B) MODIFICATION OF ASSIGNMENT, SN_____ DATED_____

4. TRANSMITTING STATION PARTICULARS

(A) SPECIFIC FREQUENCY REQUESTED (If SSB Also Show Carrier Freq.)	(B) (Reserved)

(C) NAME OF TRANSMITTER LOCATION	(D) STATE	(E) LAT. AND LONG.	(F) (Reserved)	(G) (Reserved)

(H) AREA OF OPERATION FOR MOBILES/PORTABLES	(I) NUMBER OF MOBILES/ PORTABLES IN SYSTEM	(J) SYSTEM NAME	(K) LIST CALL SIGN PRESENTLY ASSIGNED TO THIS STATION

(L) CLASS OF STATION	TYPE OF EMISSION	TRANSMITTER POWER-WATTS	CLASS OF STATION	TYPE OF EMISSION	TRANSMITTER POWER-WATTS
1.			3.		
2.			4.		

(M) EQUIPMENT NOMENCLATURE - SEE PART 313.10.5D *DEPARTMENTAL MANUAL*	(N) Is Station On Lands Of U.S.F.S. Or B.L.M. Or In An Area Requiring Coordination - See Part 313.10.5D NO_____ YES_____ (Explain Under Remarks)

(O) GENERIC TYPE NAME OF ANTENNA	(P) ANT. GAIN (dB)	(Q) ANT. ORIENTATION	(R) ELEVATION (Ft.) Site Above MSL	Ant. Above Ground	(S) (Reserved)

(T) LIST RECEIVE FREQUENCIES ASSOCIATED WITH THIS TRANSMITTER	(U) (Reserved)

(V) Transmissions On Or Monitoring Of This Frequency At This Station Will Normally Be: (CHECK ONE) Note–Work Week = 8 AM - 6 PM, Mon.-Fri

1._____REGULARLY–NOT LIMITED TO WORK WEEK
2._____REGULARLY–BUT, LIMITED TO WORK WEEK
3._____OCCASIONALLY–NOT LIMITED TO WORK WEEK
4._____OCCASIONALLY–BUT LIMITED TO WORK WEEK

ATTACHMENT 2
OSM DIRECTIVE

OFFICE OF SURFACE MINING

RADIOCOMMUNICATIONS HANDBOOK

OPERATING PROCEDURES

AUG 17 1982

DATE

RADIOCOMMUNICATION HANDBOOK

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SECTION 2. RULES AND REGULATIONS

2.1. GENERAL. Rules and Regulations have been developed to exercise control of the radio frequency spectrum which is a limited natural resource, the demands of which, at times, exceed the supply. To preclude radio infractions and possible citations, the rules and regulations given below should be observed.

2.2. LICENSING. No transmitting equipment may be operated by any activity of OSM on any frequency without a valid radio frequency assignment (license) issued by the Interdepartment Radio Advisory Committee (IRAC) through the Department of the Interior.

2.3. SECRECY. Except for emergencies, no radio operator shall intercept or divulge, without proper authorization, information of any nature whatever obtained by the unauthorized interception of communications not intended for the general use of the public.

2.4. EQUIPMENT. No radio operator shall cause or allow damage to radio equipment under his control.

2.5. UNNECESSARY, UNIDENTIFIED, OR SUPERFLUOUS COMMUNICATIONS. No radio operator shall transmit any communications of this type.

2.6. FALSE SIGNALS. No radio operator shall transmit any false or deceptive signals, communications or call sign not authorized.

2.7. INTERFERENCE. No radio operator shall willfully or maliciously interfere with or cause interference to any radio service.

2.8. CALL SIGNS. In accordance with international and FCC regulations, radio operators shall transmit complete call signs when calling and answering (See section 5 for call signs and their use).

2.9. EMERGENCY SIGNALS. The following emergency signal is universally recognized: MAYDAY (Grave and imminent danger). The calls are repeated three times preceding message. Any radio operator hearing this or any emergency call shall render whatever assistance possible. Any station hearing any emergency call must cease all transmissions likely to cause interference.

2.10. TRANSMITTED POWER. The transmitted power should be restricted to the minimum required for satisfactory communications. In no case will the transmitted power exceed the power authorized in the station assignment.

SECTION 3. STATION OPERATION

3.1. STATION READINESS. Station equipment should always be in readiness. Unless the station is manned and able to function, it is useless, particularly in an emergency when it is most urgently needed. During regular office hours, and during emergencies when mobile units are in the field, radio operating positions should be manned at all times. Operator should have pencil, paper and station log handy at all times.

3.2. STATION ACTIVATION. Upon activating the station for daily service, radio operators should check that:

A. Equipment is plugged into power source.

b. Controls and switches are in correct position.

3.3. STATION PERFORMANCE. Upon daily activation, base stations should be checked by "on-the-air" test, and reported in service. Mobile units should be tested before leaving the office. Equipment discrepancies should be noted in the radio log and reported to the appropriate supervisor.

3.4. STATIONS SERVICE ADVISORIES. Stations should broadcast an advisory each time the station is placed in or out of service.

3.5. BASIC SYSTEM CHANNELS. The radio system operates either simplex (one frequency channel for both receive and transmit) or duplex (one frequency for receiving and another for transmitting). The latter is used in repeater systems. When equipped with two frequency channels, as in dual frequency repeater systems, Channel - 2 is used primarily for mobile to mobile communications, and Channel 1 for relay through repeaters.

3.6. MICROPHONE TECHNIQUE. Station performance starts with the microphone--the first active element in the station. Talk across and no more than two inches from the microphone, not directly into it. You want to reproduce the sounds of your vocal chords and not the spray, hot breath, or background noise. Speak slowly and distinctly, using normal voice level free of emotion. Don't let your gaze wonder all over the station causing sharply varying speech levels. Make certain the microphone button is released when not transmitting.

3.7. STATION SECURITY. Radio stations, particularly those which are remotely controlled such as base and repeater stations, should be closed to unofficial personnel by lock and key when unmanned. This includes radio-equiped vehicles when parked in public locations.

SECTION 4.. GENERAL OPERATING PRACTICES (con't)

Reports as "Five by five," "Four by three," etc., are meaningless and should not be used.

4.9. OPERATING PROCEDURES. In addition to previous sample transmissions, the following operating procedures shoul be used in placing and answering calls:

A. When an operator places his or her radio in service, the operator will indicate that fact by stating that the unit is 10/8. For example, Unit 100 is 10/8. Likewise, when the unit is placed out of service, the operator will indicate the unit is 10/7. For example, Unit 100 is 10/7.

B. Contacts with other units and base stations are also made using the procedures outlined in the following examples:

1. To contact another mobile: Unit 100 wishes to contact Unit 200.

   Unit 100 to Unit 200
   Unit 200 to Unit 100, go ahead.

2. To contact a base station: Unit 100 wishes to contact Beckley Office.

   Unit 100 to Beckley
   Beckley Radio Operator - Beckley to Unit 100, go ahead.

3. To signify that the contract is over: Unit 100 <u>clear</u>.

C. Use of "10" Code Signals: Proper use of these signals will reduce transmission time and promote efficient use of the system, examples follow:

1. Unit 100 wants to know if Unit 200 is available for a phone call in Beckley.

   Unit 100 to Beckley, is Unit 200 10/40?

2. Unit 200 is not available: therefore Unit 100 wants Unit 200 to call him in the Charleston Office.

   Unit 100 to Beckley, 10/5 Unit 200 10/21 Unit 100 in Charleston Office.

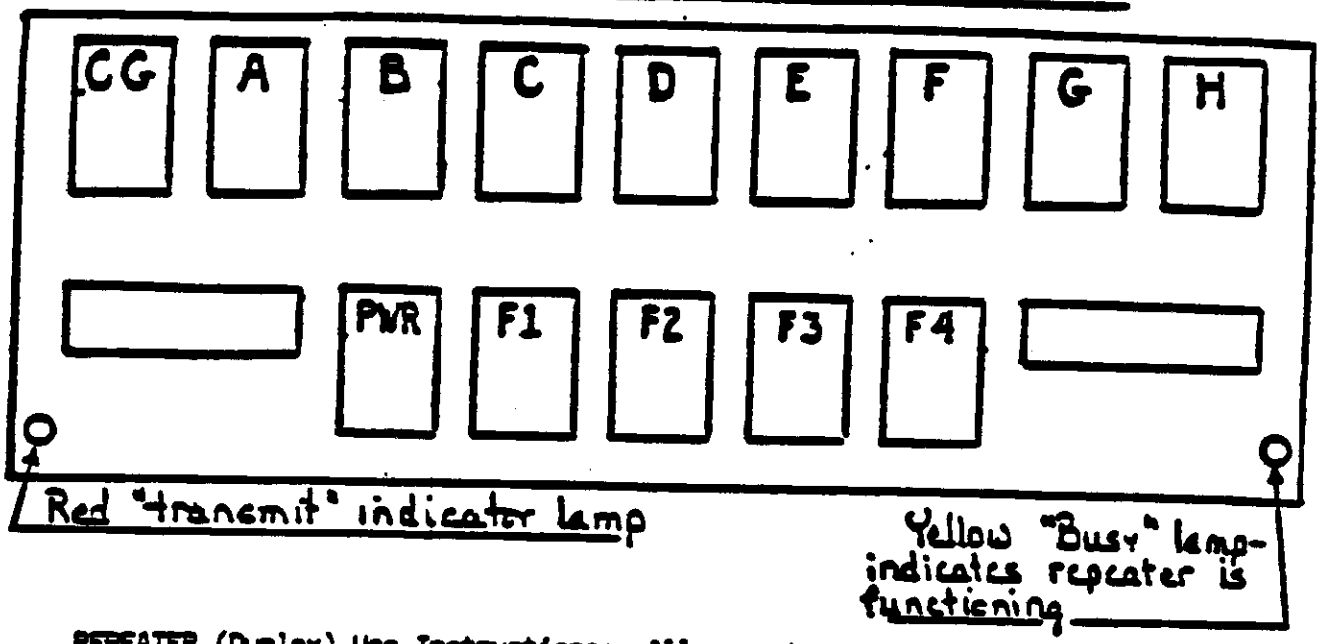
3. Remaining "10" code signals should be self-explanatory.

RADIOCOMMUNICATION SYSTEM
OPERATING PROCEDURE

MOBILE/REPEATER OPERATING INSTRUCTIONS

EXHIBIT 5-1

Main Radio Control-Panel



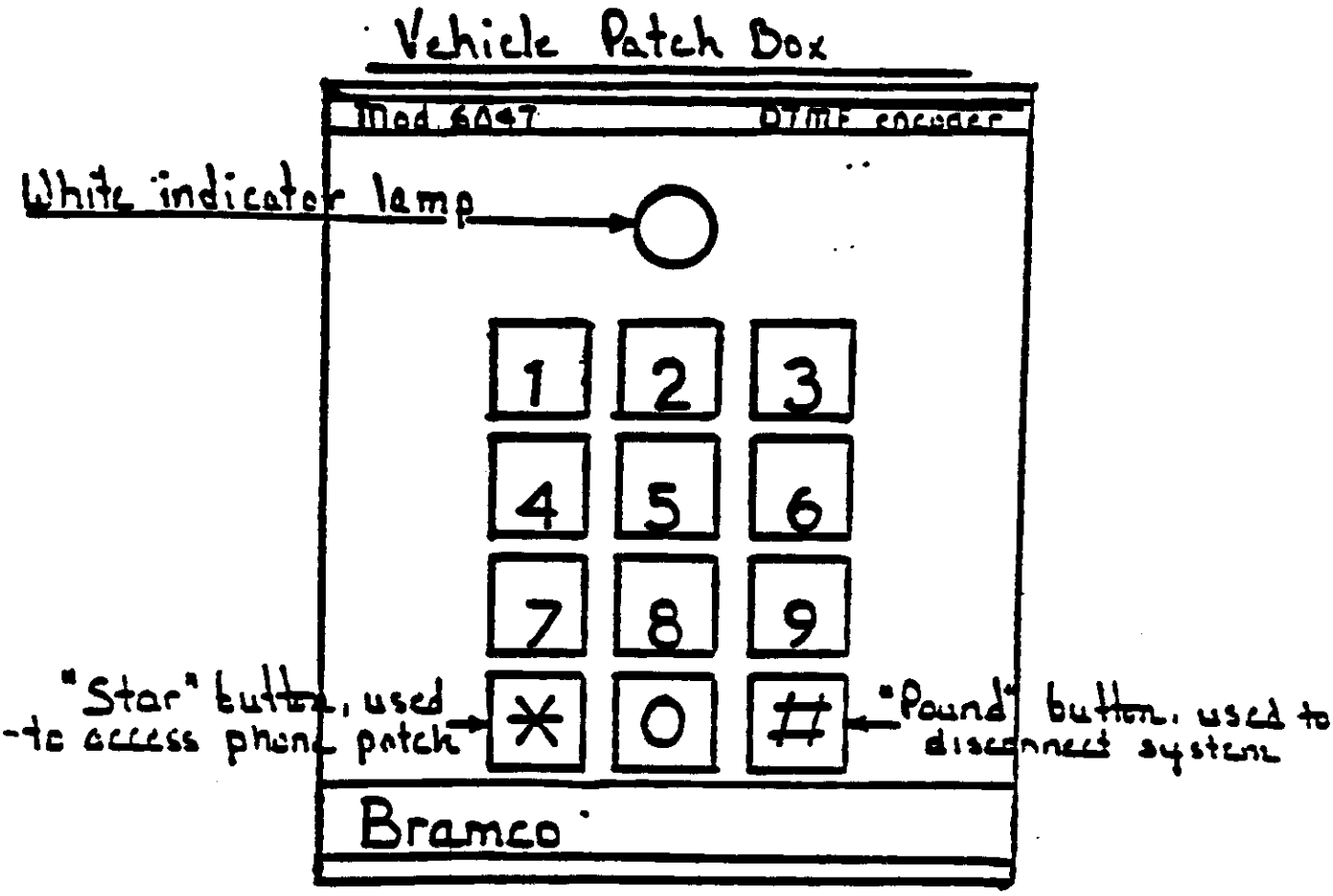
REPEATER (Duplex) Use Instructions: All repeaters are designed to decode one channel guard tone. In other words, an individual repeater will transmit when it receives a signal from a mobile or base station, along with the appropriate tone. The operator of a mobile station must select the appropriate tone to activate the desired repeater. The following example lists instructions to activate the Knoxville Repeater, Channel Guard B. Any other repeater may be accessed in the same manner except the appropriate channel guard would be utilized in lieu of channel guard B.

A. On the second or bottom row of the mobile, press the power (PWR) button and the next button marked "F1". Note" The "F2" button is mobile to mobile or portable and generally will only be used for short-range communications.

B. You are now ready to select a repeater channel. In this example we are using channel B (Knoxville). Press the CG button and the B button on the top row of the mobile. You have now selected the Knoxville repeater and can talk to any unit operating within the range of the Knoxville Repeater or you may talk to the Knoxville Base. When the microphone button is depressed, the red transmitter indicator lamp on the control head (see drawing above) will light. When the button is released, the yellow "channel busy" light will light, indicating that the repeater is functioning. A steady yellow light and a steady noise from the speaker indicate that the repeater is functioning properly.

NOTE: Be sure to turn off the radio power (by depressing the PWR button) when you leave the vehicle. This will prevent battery drain. Also, the engine of the vehicle should always be running while the mobile unit is transmitting. The transmitter consumes large amounts of power, and can quickly discharge the battery if the engine is not running.

EXHIBIT 5-3 · BRAMCO ENCODER (PHONE PATCH)



A. The vehicle patch box is the control unit used to operate the auto-patch equipment. However, the patch box works through the main radio control panel in the vehicle. Accordingly, the main controls must be correctly set to utilize the auto-patch—power "on", "F1" selector button depressed, and the "CG" and appropriate tone button on the control pannel upper row also depressed.

B. To "access" or activate the phone patch, the operator must first insure that the main panel controls are correctly set, as above. The "star" key (see accompanying diagram) is than depressed and held until the white indicator lamp on the patch box lights. When the lamp lights, the operator can release the "star" key. After a short delay, a dial tone should be heard through the radio speaker and the yellow "busy" lamp on the main control panel should also be lighted. These indications confirm that the repeater is operating and that the phone patch has been correctly accessed.

EXHIBIT 5-3 BRAMCO ENCODER (PHONE PATCH) (con'd)

G. Time Limits - The auth-patch is equipped with a self-timer to prevent the patch from accidentally remaining engaged for an excessive period. this timer provides approximately 3 minutes 20 seconds for each use, starting when the "star" button accesses the patch. Then only approximately 40 seconds remain , a warning timer will broadcast an audible "beep" at 5 second intervals heard only on the radio. At the end of this warning period, the main timer will automatically knock-down the system. Aproximately 6 seconds should be allowed before attempting to re-access the patch.

H. Distances - Due to such factors as antenna height and efficiency, operators can sometimes "hear" the repeater at a greater distance than the repeater can "hear" the operator. Before attempting to utilize the phone patch, check to see that clear access is available to the repeater - key the radio microphone and observe the yellow "busy" lamp on the control panel. A steady light and steady noise from the speaker should indicate a clean signal path to and from the repeater. If the light flickers and the noise varies, attempt to find a higher, more line-of-sight location in relation to the repeater. At marginal distances results will probably be more satisfactory if the operator is stationary at a high location.

I. Cautions - Remember that the auto-patch is still part of a radio system. Other bases and units, or any citizen with a scanner capable of receiving the appropriate band can listen to your conversation. Always inform the telephone party that the conversation is via a radio hookup. Be discrete. Do not use, and do not allow the use of profanities on the air. The operator controls the conversation - if a contact begins to get out of hand, knock the system down and resume the conversation in a more controlled atmosphere, or over more conventional facilities.

RADIOCOMMUNICATION SYSTEM
OPERATING PROCEDURE

EXHIBIT 5-4

BASE STATION/REPEATER LOCATION, CALL SIGNS,
CHANNELS AND PHONE PATCH LOCAL EXCHANGES

STATE	BASE STATION LOCATION(s)	CALL SIGN	CHANNEL	REPEATER LOCATION	LOCA EXCHAN FOR PH PATC
ALABAMA	Birmingham	KDJ920	D C	Ft. Payne (North East Alabama) Brindley Mtn. (North Central Alabama	845 482
TENNESSEE	Knoxville	KDJ900	B A	Walnut Mtn. (La Follette, Tn.) Hinch Mtn. (Crossville, Tn.)	None 484/7
KENTUCKY	Madisonville	KDJ927	A B	Providence, Kentucky Harford, Kentucky	667 298
	Pikeville	KDJ917	B A	Dick's Knob Thelka (Paintsville, Kentucky)	456 789
	London	KDJ905	F E C D	London Pine Mountain (Harlan) Jackson Hazard (Buffalo Mountain)	878/843 337 666 436/4
PENNSYLVANIA	Wilkes-Barre	KDJ942	A	Penobscot Mountain	474-96
	Johnstown	KDJ931	A B C D	Rimersburg Clearfield (Rocton Mountain) Johnstown (Laurel Ridge) Washington (Mt. Wheeler)	745-20 765-01 533-43 No pat
WEST VIRGINIA	Charleston	KA2XJQ Tempo-rary	E	Blair Mountain (Logan County)	No pat
	Beckley	KDJ940	C D	Mann Mountain (Layland) Ivy Knob (Bolt Mountain)	438-82 No pat
	Morgantown	KDJ945	A B E F	Laurel Mountain (Belington) Sharp Knob (Slaty Fork) Deep Creek Lake (McHenry, MD) Chestnut Ridge (Morgantown)	636-94 No pat 387-46 594-14
VIRGINA	Big Stone Gap	KDJ922	A B	Big A Mountain High Knob (Norton)	No pat 679-07

RADIOCOMMUNICATION SYSTEM

EXHIBIT 5-5

OPERATING PROCEDURE

RADIO CALL SIGN USAGE

Call signs are assigned to repeaters and base stations. It is necessary that operators follow these instructions on use of the call signs:

A. Repeater call signs will not be utilized by our operators.

B. Mobiles do not use the call signs but will utilize the call numbers assigned to each operator.

C. At the end of each completed communication, base stations should identify by transmission of complete call sign. This identification should be given at least once each 15 minutes in a prolonged series of transmissions. For example, the Knoxvill Base station would sign off by saying, Knoxvill clear, KDJ-900.

D. Base Stations may be addressed by the mobile operators by their name such as "Knoxville", "Beckley" and etc., rather than their call sign.

RADIOCOMMUNICATION SYSTEM
OPERATING PROCEDURE

SECTION 6. RADIO CALL NUMBER ASSIGNMENTS

6.1. GENERAL. For purposes of radio security it is necessary to assign call numbers to all OSM personnel who may have requirements to operate the mobile radio system. When utilizing the radio system individuals will identify themselves only by use of their call number.

6.2. ASSIGNMENTS. The following are the call numbers assigned to each State Office and Technical Service Center having mobile radio equipment. Utilizing their assigned block of numbers, each State Office Director and the Eastern Technical Service Center Administrator will assign a call number to their personnel who will have occasion to utilize the radio system. Deviations from the attached list will not be made without approval of the OSM Radio Liaison Officer. In order to insure that each office having a radio system, is aware of individual assigned call numbers, an information copy of each office assignment will be sent to each office having radio equipment.

RADIO CALL NUMBER ASSIGNMENTS

NUMBERS ASSIGNED	OFFICE
1	Director
2	Deputy Director
3	Assistant Director, Program Operation and Inspection
4	Eastern Technical Service Center Administrator
5	Western Technical Service Center Administrator
6	Assistant Director, Technical Service and Research
7-99	RESERVED
100-199	Alabama State Office
200-229	Kentucky State Office
230-249	London
250-269	Madisonville
270-289	Pikeville
290-299	ASSIGNED AS NEEDED BY KENTUCKY
300-329	Pennsylvania State Office (Harrisburg)
330-349	Johnstown
350-369	Wilkes-Barre
370-399	ASSIGNED AS NEEDED BY PENNSYLVANIA
400-499	Tennessee State Office
500-599	Virginia State Office
600-629	West Virginia State Office
630-649	Beckley
650-669	Morgantown
670-699	ASSIGNED AS NEEDED BY WEST VIRGINIA
700-799	Eastern Technical Service Center
800-999	RESERVED

SECTION 8. RADIO LOGS

8.1. OPERATING LOGS. A station log shall be maintained for each base station containing at a minimum the following information:

1. Dates and periods of operation.

2. Frequencies used.

3. Call sign employed.

4. Identification of operator in charge.

5. Messages showing time of dispatch which are not duplicated elsewhere in appropriate records. These dispatch records must be retained for two years.

6. Record of all emergency call.

The times of each individual transmission are not required, but the record of periods of operation (per # 1 above) should be complete. The station log may be destroyed at the end of six months. Station logs are not required for repeater stations. Attached is an example of a radio log that may be used by the base stations.

8.2. RECORDING MACHINES. As a general rule recording machines should not be used, however, when using tape recorders to record radio messages, the following should be observed.

A. Obtain written approval from appropriate line officer or verbal approval from station to be recorded. The verbal approval should be recorded.

B. Log in station record the operator's name, date, and time of recording; also, names of communicating parties and subject(s) of the recording.

C. Label and retain tape(s) as part of the station record.

RADIO STATION AND ACTIVITY LOG

Frequency Channel
168,500 MHz - 1
166,800 MHz - 2

Location _____
Call Sign _____

Rated Power 100 Watts
Emission Type 16F3

DATE TIME	STATION OR CONTRACTED	CHANNEL USED	LOGGED ACTIVITIY OR REMARKS	OPERA

SECTION 9. MOBILE RADIO REMOVAL PROCEDURE

9.1. GENERAL. As a general practice all mobile radio removals (except for porta-mobile units) should be performed by an authorized service shop. The removal of radios by untrained personnel can result in serious damage to the unit. If, in the event of an emergency, it becomes necessary for OSM personnel to remove a mobile unit for protection of the radio and system, the procedure outlined below will be followed.

9.2. INSTRUCTIONS FOR REMOVAL.

A. Unscrew, counter-clockwise, the antenna connector and disattach.

B. Loosen the captive retaining screw, counter-clockwise, on the control cable termination plug and then disattach this plug.

C. Unlock the radio cabinet lock on the front panel, using GE Key #BF-10A and turning counter-clockwise.

D. Loosen the two captive screws (Phillips head) at the bottom corners of the radio's front panel.

E. Grasp the front panel handle and pull the radio unit two or three inches forward in its slide-in mounting frame and then lift the unit out.

F. Take care not to allow the units top cover to be misplaced, this cover can be easily removed but should remain with the radio to keep out dust and moisture during storage.

9.3. INSTRUCTIONS TO REINSTALL THE UNIT.

A. Reverse the above procedure.

B. Exercise great care to insure the radio's antenna lead is securely reattached before attempting to operate the unit. Failure to do so can result in serious damage to the transmitter.

C. Also, be aware that for a quick measure to make any radio unit non-operational, the main fuse located under the vehicle's hood may be removed. This measure will quickly prevent unauthorized transmissions or monitoring.